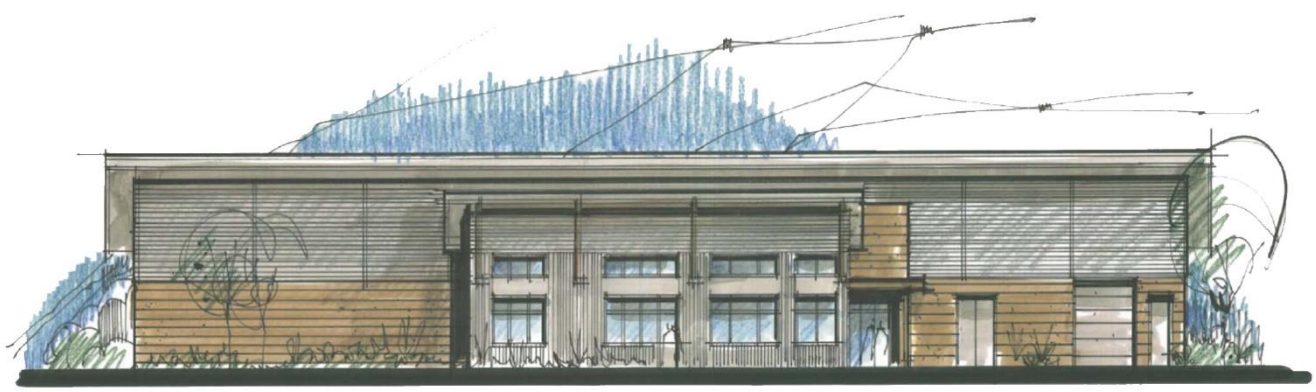
B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

# Crystal Springs Hatchery Program

## Draft
## Environmental Impact Statement
## DOE/EIS 0500

May 2017



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**Draft**

**Environmental Impact Statement**

**DOE/EIS-0500**

**Bonneville Power Administration**
**Shoshone-Bannock Tribes of the Fort Hall Reservation**
**U.S. Forest Service**
**National Marine Fisheries Service**

**May 2017**

## Crystal Springs Hatchery Program

**Responsible Agency:** U.S. Department of Energy, Bonneville Power Administration

**Cooperating Agencies:** Shoshone-Bannock Tribes of the Fort Hall Reservation, U.S. Forest Service, National Marine Fisheries Service

**Title of Proposed Project:** Crystal Springs Hatchery Program (DOE/EIS-0500)

**States Involved:** Idaho

**Abstract:** Bonneville Power Administration (BPA) is proposing to fund construction and operation of the Shoshone-Bannock Tribes' (Tribes) Crystal Springs Hatchery Program (Hatchery Program) in Idaho. Operation of the hatchery would involve producing Snake River spring/summer-run Chinook salmon (Chinook salmon) for release into two locations in the Salmon River basin and Yellowstone cutthroat trout for release into a lake on the Tribes' reservation. The hatchery would be constructed at an obsolete trout hatchery in Bingham County, and two fish trapping (weir) facilities would be developed within the Salmon-Challis National Forest—one on the Yankee Fork of the Salmon River (Yankee Fork) (Custer County) and one on Panther Creek (Lemhi County) (Figure ES-1). The Hatchery Program would produce up to one million Chinook salmon smolts and 5,000 Yellowstone cutthroat trout to provide harvest opportunities for Tribal and non-Tribal fishers in the Snake River basin and to contribute to the efforts to restore naturally-spawning populations of Chinook salmon. Snake River spring/summer-run Chinook salmon are listed as threatened under the Endangered Species Act (ESA) (70 FR 37160). Yellowstone cutthroat trout are not ESA-listed, but are classified as a species of concern by the U.S. Fish and Wildlife Service. The U.S. Forest Service (USFS), National Marine Fisheries Service (NMFS), and Tribes are cooperating agencies for the development of this environmental impact statement (EIS). The proposed Hatchery Program could create impacts on land use and recreation, transportation, geology and soils, vegetation, water resources and wetlands, fish, wildlife, cultural resources, social and economic resources, air quality and climate change, visual resources, noise, and public health and safety. Chapter 3 of this EIS describes the affected environment and potential impacts from the proposed Hatchery Program, and possible mitigation measures.

**Public review of and comment on this Draft EIS will continue through June 26, 2017.**

**For additional information, contact:**

Jenna Peterson - ECF4
Project Environmental Lead
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208
Telephone: (503) 230-3018
Email: jepeterson@bpa.gov

**To submit a comment:**

- Online: http://www.bpa.gov/comment
- Mail: Crystal Springs Hatchery Program, P.O. Box 9250, Portland, OR 97207
- Voicemail: 800-622-4519

**For additional copies of the Draft EIS:**

- Internet—The Draft EIS is available on the Internet at: http://www.bpa.gov/goto/CrystalSprings
- Compact Disc and Hard Copies— Complete a request form at https://www.bpa.gov/Contact/VisitorCenter/Pages/RequestForm.aspx or call the automated recording line at 1-800-622-4520 and leave your name and mailing address.

For additional information on U.S. Department of Energy (DOE), National Environmental Policy Act (NEPA) activities, please contact Director, Office of NEPA Policy and Compliance, GC-20, U.S. Department of Energy, 1000 Independence Avenue S.W., Washington D.C. 20585-0103, phone: 1-800-472-2756 or visit the DOE NEPA Web site at www.doe.gov/nepa

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# Acronyms and Abbreviations

| | |
|---|---|
| AQI | Air Quality Index |
| AVE | area of visual effect |
| BMP | best management practices |
| BPA | Bonneville Power Administration |
| USBR | Bureau of Reclamation |
| CO2 | Carbon dioxide |
| CO2e | carbon dioxide equivalent |
| CVM | Center for Veterinary Medicine |
| CFR | Code of Federal Regulations |
| CSA | combined statistical area |
| CSH | Crystal Springs Hatchery |
| cfs | cubic feet per second |
| ESPA | East Snake Plain Aquifer |
| ESA | Endangered Species Act |
| EIS | Environmental Impact Statement |
| EPA | Environmental Protection Agency |
| ESU | Evolutionarily Significant Unit |
| °F | Fahrenheit |
| FCRPS | Federal Columbia River Power System |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| FRTA | Forest Road and Trail Act |
| FSM | Forest Service Manual |
| gpm | gallons per minute |
| GHG | greenhouse gas |
| HGMPs | Hatchery and Genetic Management Plans |
| HSRG | Hatchery Scientific Review Group |
| HGM | Hydrogeomorphic Classification System |
| HUC | Hydrologic Unit Code |
| IDAPA | Idaho Administrative Procedures Act |
| IDEQ | Idaho Department of Environmental Quality |
| IDFG | Idaho Fish and Game |
| IDNHP | Idaho Natural Heritage Program |
| ITD | Idaho Transportation Department |
| ISRP | Independent Scientific Review Panel |
| IPaC | Information, Planning, and Consultation |
| IPCC | Intergovernmental Panel on Climate Change |
| IBC | International Building Code |
| LRMP | Land and Resource Management Plan |

| | |
|---|---|
| MPGs | major population groupings |
| CH4 | Methane |
| MT | metric tons |
| MSA | Metropolitan Statistical Area |
| MWAM | Montana Wetland Assessment Method |
| NAAQS | National Ambient Air Quality Standards |
| NEPA | National Environmental Policy Act |
| NFIP | National Flood Insurance Program |
| NMFS | National Marine Fisheries Service |
| NPDES | National Pollutant Discharge Elimination System |
| NWSRS | National Wild and Scenic River System |
| NTU | Nephelometric Turbidity Units |
| N2O | Nitrous oxide |
| ORV | outstandingly remarkable value |
| Northwest Power Act | Pacific Northwest Power Planning and Conservation Act of 1980 |
| ppm | part per million |
| PCEs | primary constituent elements |
| RM | River Mile |
| Tribes | Shoshone-Bannock Tribes |
| SFHA | Special Flood Hazard Areas |
| SPCC | Spill Prevention, Control, and Countermeasures |
| SHPO | State Historic Preservation Office |
| TMDLs | total maximum daily loads |
| TERO | Tribal Employment Rights Ordinance |
| USFS | U.S Forest Service |
| USACE | U.S. Army Corps of Engineers |
| Reclamation | U.S. Bureau of Reclamation |
| USDA | U.S. Department of Agriculture |
| EPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |
| USC | U.S. Government Code |
| USGCRP | United States Global Climate Research Program |
| WTP | willingness to pay |
| YFCSS | Yankee Fork Chinook Salmon Supplementation Strategy |
| Yankee Fork | Yankee Fork of the Salmon River |

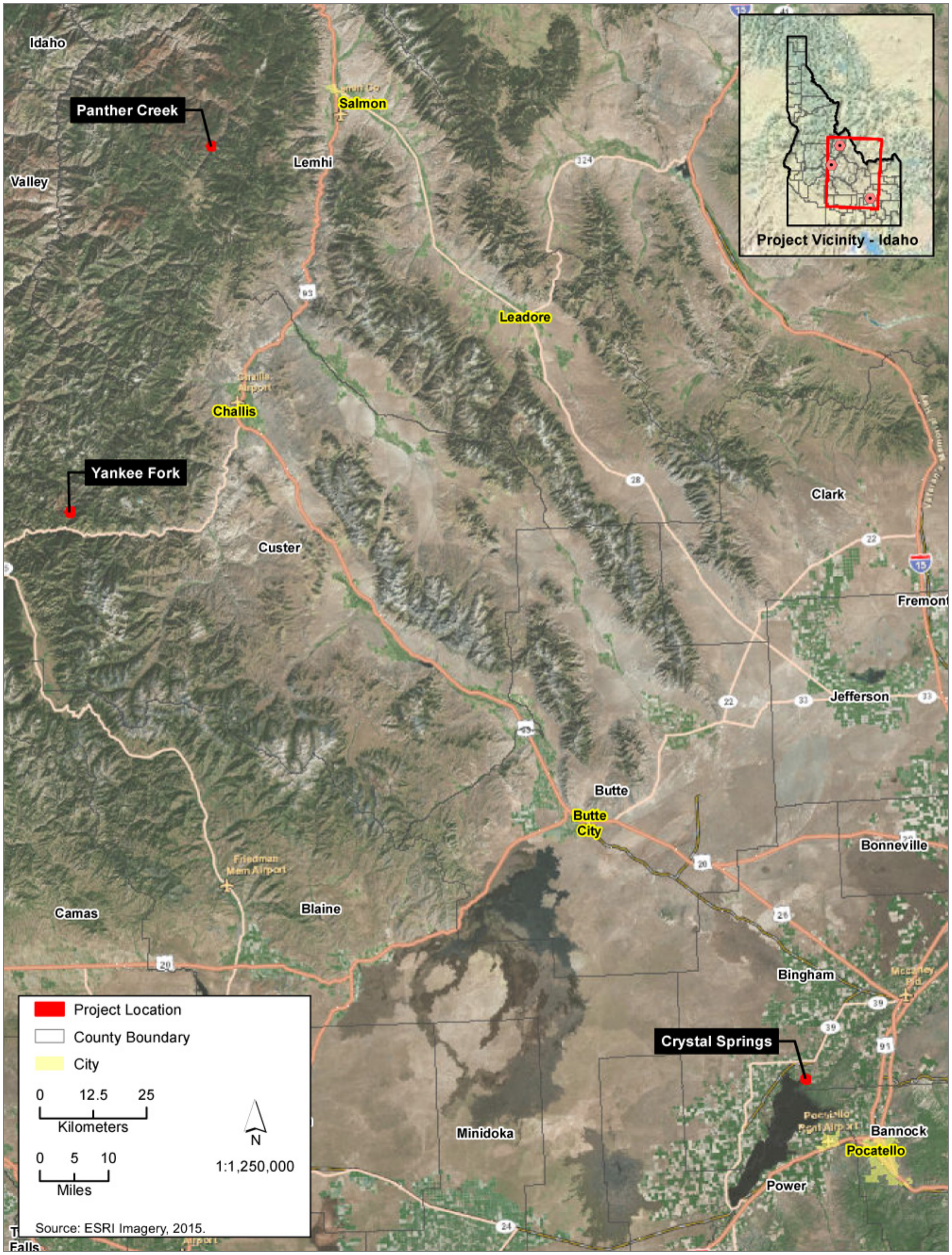
# ES.1 Introduction

Bonneville Power Administration (BPA) is proposing to fund construction and operation of the Shoshone-Bannock Tribes' (Tribes) Crystal Springs Hatchery Program (Hatchery Program) in Idaho. Operation of the hatchery would involve producing Snake River spring/summer-run Chinook salmon (Chinook salmon) for release into two locations in the Salmon River basin and Yellowstone cutthroat trout for release into an oxbow lake on the Tribes' reservation.

The hatchery would be constructed at an obsolete trout hatchery in Bingham County, and two fish trapping (weir) and acclimation facilities would be developed within the Salmon-Challis National Forest—one on the Yankee Fork of the Salmon River (Yankee Fork) (Custer County) and one on Panther Creek (Lemhi County) (Figure ES-1). The Hatchery Program would produce up to one million Chinook salmon smolts and 5,000 Yellowstone cutthroat trout to provide harvest opportunities for Tribal and non-tribal fishers in the basin and to contribute to the efforts to restore naturally spawning populations of Chinook salmon. Snake River spring/summer-run Chinook salmon are listed as threatened under the Endangered Species Act (ESA) (70 FR 37160). Yellowstone cutthroat trout are not ESA-listed but are a species of concern by the U.S. Fish and Wildlife Service.

This Environmental Impact Statement (EIS) was prepared by BPA pursuant to regulations implementing the National Environmental Policy Act (NEPA) (42 U.S. Government Code 4321 et seq.), which requires federal agencies to assess the impacts that their actions may have on the environment. Major federal actions significantly affecting the quality of the human environment must be evaluated in an EIS. The U.S. Forest Service (USFS), National Marine Fisheries Service (NMFS), and Tribes are cooperating agencies for the development of this EIS.

**Figure ES-1. Locations of Proposed Crystal Springs Hatchery Program Facilities**



# ES.2 Need for Action

Need statements for the Hatchery Program are described below for BPA, USFS, and NMFS.[1] The following is also presented in Chapter 1, *Purpose of and Need for Action*, of this EIS.

## ES.2.1 Bonneville Power Administration

BPA needs to respond to the Tribes' request to fund their proposal to construct and operate a hatchery to raise Chinook salmon to be released in the Salmon River basin, and Yellowstone cutthroat trout to be released into an oxbow lake in Fort Hall Bottoms within the Fort Hall Reservation in southern Idaho, and to develop weir facilities at the Pole Flat Campground along the Yankee Fork and at the Cobalt Ranger District administrative site along Panther Creek.

## ES.2.2 U.S. Forest Service

The USFS Salmon-Challis National Forest needs to respond to the Tribes' application for special use permits on national forest lands for the Tribes' weir facilities on the Yankee Fork and Panther Creek.

## ES.2.3 National Marine Fisheries Service

The Tribes' Hatchery and Genetic Management Plans will undergo ESA review by NMFS prior to implementing the Hatchery Program. Under the future proposed ESA action contemplated by NMFS, NMFS would evaluate effects of the Hatchery and Genetic Management Plans on ESA-listed Chinook salmon and steelhead in an ESA Section 7 consultation. NMFS's need for the Proposed Action would be to ensure that hatchery production of Snake River spring/summer-run Chinook salmon complies with requirements of the ESA and contributes to efforts to restore naturally spawning populations of Chinook salmon in the Salmon River basin.

# ES.3 Purposes

Purposes for the Hatchery Program for BPA, the Tribes, USFS, and NMFS are described in this section. The following is also presented in Chapter 1, *Purpose of and Need for Action*, of this EIS.

## ES.3.1 Bonneville Power Administration

In meeting the need for Proposed Action, the alternatives considered should achieve the purposes listed below. BPA will base its choice among alternatives on how well each alternative meets these purposes.

- Support efforts to mitigate for effects of the development and operation of the Federal Columbia River Power System on fish and wildlife in the Columbia River and its tributaries, including the

[1] While the Tribes are considered a cooperating agency on the development of this EIS, they are not a federal agency and, therefore, do not have a NEPA decision to make as part of this process. Therefore, the Tribes do not have a need for action.

Snake River, under the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 *et seq.*).

- Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement between BPA and the Tribes (Shoshone-Bannock Tribes et al. 2008).
- Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction, which calls for protecting weak stocks—like the Snake River spring/summer-run Chinook salmon—while sustaining overall populations of fish for their economic and cultural value (BPA 2003).
- Minimize harm to natural and human resources, including species listed under the ESA.

## ES.3.2 Shoshone-Bannock Tribes

The Tribes have identified the following purposes for the Proposed Action.

- The primary purpose for the Hatchery Program is to increase terminal harvest opportunities for Tribal members in the Yankee Fork and Panther Creek, with a minimum of 1,000 adult Chinook salmon in Yankee Fork, and a minimum of 800 adult Chinook salmon in Panther Creek.
- The Hatchery Program would also ensure Tribal members have the opportunity to harvest Chinook salmon using both traditional hunting methods (i.e., spearing) and contemporary methods (i.e., weirs, hook-and-line, or nets). In addition, the Hatchery Program would contribute to the Tribal goal of providing opportunities to see Chinook salmon spawn naturally by increasing the abundance of adults on the spawning grounds.
- The Hatchery Program would produce the fish required to achieve the Hatchery Program's defined purpose (i.e., harvest) on a long-term sustainable basis.
- The Hatchery Program would increase natural-origin Chinook salmon abundance in two additional streams (i.e., Yankee Fork and Panther Creek). Use of appropriate broodstock would reduce risks (e.g., from straying) to other populations associated with the evolutionary significant unit. Carcasses from natural spawning adults would also provide nutrients for other native species, thereby improving the health and abundance of these species over time.

## ES.3.3 U.S. Forest Service

USFS has identified the following purpose to meet its need for the Proposed Action.

- Ensure any special use permit issued is consistent with the Salmon and Challis National Forest plans.

## ES.3.4 National Marine Fisheries Service

NMFS has identified the following purposes to meet its need for the Proposed Action.

- Ensure the Proposed Action does not jeopardize the continued existence of ESA-listed Chinook salmon or steelhead or result in destruction or adverse modification of designated critical habitat.
- Ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon by conserving its productivity, abundance, diversity, and distribution.

# ES.4 Public Involvement

BPA, the Tribes, and USFS conducted a series of public meetings in the analysis area to provide project-related information and to solicit public input regarding the issues and alternatives to be addressed in the EIS being prepared for the Hatchery Program. NMFS was not yet involved in the project at the time these meetings were held, and therefore did not participate. The meetings were held at the following locations and dates:

- Fort Hall Reservation, Idaho – June 10, 2014
- Salmon, Idaho – June 11, 2014
- Challis, Idaho – June 12, 2014

These meetings included presentations by Tribal and BPA staff, open question-and-answer sessions, and opportunities for the public to provide comments on the proposed Hatchery Program. Twenty-eight people attended the public meetings and 11 people submitted written comments either through the project website or by mail.

A complete listing of the comments and questions presented at these public meetings and received in letters is included in Appendix A. Where relevant, these comments and questions have been reflected in the text of this EIS. The issues raised during public scoping, as well as where these issues are addressed in this EIS, are presented in Table ES-1.

**Table ES-1. Issues Raised during Public Scoping and Where These Issues are Addressed in the EIS**

| Topic | Issues | Where Addressed in the EIS |
|---|---|---|
| Purpose and Need | The new hatchery should be managed for conservation, as well as for harvest | Section 1.5.2, *Chinook Salmon Activities in the Yankee Fork and Panther Creek Basins* |
| Description of Action | Numbers of fish raised | Section 2.1, *Hatchery Program with Permanent Weir Facilities*<br>Section 2.1.3.1, *Crystal Springs Hatchery* |
| | Source of funding for construction | Section 1.1, *Introduction* |
| | Numbers and salaries of hatchery employees | Section 2.1.3.1, *Crystal Springs Hatchery*, describes employees; salaries not stated |
| | Sources of hatchery water and water rights | Section 3.5, *Groundwater and Surface Water Quality and Quantity* |
| | Anticipated fish survival rates | Section 2.1.3.2 *Yankee Fork Chinook Salmon*<br>Section 2.1.3.3, *Panther Creek Chinook Salmon* |
| | Hatchery construction and operation timeframes | Section 2.1.1.6, *Construction*<br>Section 2.1.3.1, *Crystal Springs Hatchery* |
| | Location of new facilities relative to existing facilities | Section 2.1.1.1, *Hatchery Site*<br>Section 2.1.2.1, *Yankee Fork Weir Facilities* |

| Topic | Issues | Where Addressed in the EIS |
|---|---|---|
| | | Section 2.1.2.2, *Panther Creek Weir Facilities* |
| | Timing of fish collection and release | Section 2.1.3.2, *Yankee Fork Chinook Salmon*<br>Section 2.1.3.3, *Panther Creek Chinook Salmon*<br>Section 2.1.3.4, *Yellowstone Cutthroat Trout Program* |
| | Proposed fish marking techniques | Section 2.1.5.1, *Yankee Fork*<br>Section 2.1.5.2, *Panther Creek* |
| | Hatchery capacity | Section 2.1.1.2, *Hatchery Elements*<br>Section 2.1.3.1, *Crystal Springs Hatchery* |
| | Invasive species control plans | Section 3.4, *Vegetation* |
| | Protocol for release of non-target fish species | Table 2-5, *Description of Yankee Fork Weir Facilities under Alternative 1 and Alternative 2*<br>Section 3.7.2, *Environmental Consequences* |
| | Details of construction monitoring | Section 2.1.2, *Fish Trapping Weirs* |
| | Relationship of the Proposed Action to the HSRG recommendations | Section 1.4.4, *Hatchery Reform*<br>Section 2.1.3.2*, Yankee Fork Chinook Salmon*<br>Section 2.1.3.3, *Panther Creek Chinook Salmon* |
| | Hatchery effectiveness criteria | Section 2.1.3, *Program Operations* |
| | Disposition of facilities at the end of the Hatchery Program | Section 2.1, *Alternative 1: Hatchery Program with Permanent Weir Facilities*<br>Section 2.2, *Alternative 2: Hatchery Program with Temporary Weir Facilities* |
| Alternatives | Yellowstone cutthroat trout program that raises 10,000 trout | Section 1.5.3, *Yellowstone Cutthroat Trout*<br>Section 2.1.3.4, *Yellowstone Cutthroat Trout Program* |
| | Temporary holding facilities associated with the temporary weirs alternative | Section 2.2.1, *Yankee Fork Weir Facilities*<br>Section 2.2.2, *Panther Creek Weir Facilities* |
| | Relative maintenance requirements of permanent versus temporary facilities | Section 2.2.3, *Similarities and Differences between Alternative 1 and Alternative 2* |
| | Preferred alternative | The preferred alternative will be identified in the Final EIS. |

| Topic | Issues | Where Addressed in the EIS |
|---|---|---|
| Environmental Issues/Concerns | Status of mining releases in the watersheds | Section 3.5, *Groundwater and Surface Water Quality and Quantity* |
| | Effect of mining on anticipated number of fish returning to the system; fish movement timeframes | Section 3.7, *Fish*<br>*Section 3.17, Cumulative Impacts* |
| | Effects on threatened, endangered, Region 4 Forest Service Sensitive species, Salmon-Challis National Forest Management Indicator Species, migratory birds, and other species of concern identified throughout the scoping process | Section 3.8, *Wildlife* |
| | Effects on cultural resource at USFS sites | Section 3.9, *Cultural Resources* |
| | USFS visual resource requirements | Section 3.12, *Visual Quality* |
| | Wild and scenic river status of Panther Creek (and Yankee Fork) | Appendix D, *Wild and Scenic Rivers Analysis* |
| Other Issues, Questions, and Information | Other hatcheries being proposed | Section 3.17, *Cumulative Impacts* |
| | Protect wild fish rather than produce hatchery fish | Section 3.7, *Fish* |
| | Consider both Salmon and Challis forest management plans | Table 2-7, *Comparison of Alternatives by Purpose* |
| | Non-Tribal harvest allowed in Panther Creek | Chapter 2, *Alternatives, Including the Proposed Action*<br>Section 3.1, *Land Use and Recreation* |
| | Contact County commissioners regarding the Hatchery Program | Section 1.8, *Public Involvement and Scoping* |
| | How citizens can support the Hatchery Program | Not discussed; however, the public may submit comments on this Draft EIS, during the 45-day public review and comment period. |
| | Yellowstone cutthroat trout element of the Hatchery Program will not be considered in the USFS action on the overall Hatchery Program | Not discussed; the Yellowstone cutthroat trout element of the Hatchery Program is not associated with USFS land and, therefore, does not require a permit action on behalf of the USFS and will not be a component of USFS's NEPA decision. |
| | USFS does not consider scoping to end by a specified time | Comment acknowledged. Please note the public scoping period for the Proposed Action ended on July 7, 2014. |

In response to public scoping comments, BPA, USFS, and the Tribes met with Lemhi and Custer County commissioners to present the proposed Hatchery Program and respond to any questions or comments they might have. These meetings occurred on the following dates:

- March 23, 2015: USFS and the Tribes met with the Lemhi County Commissioners to discuss the Panther Creek portion of the proposed Hatchery Program.

- April 13, 2015: BPA, USFS, and the Tribes met with Custer County Commissioners to discuss the Yankee Fork portion of the proposed Hatchery Program.
- July 1, 2015: USFS and the Tribes performed a site visit with the Lemhi County Commissioners to view the current operations at Yankee Fork temporary weir facility.

# ES.5 Proposed Action and Alternatives

This section summarizes the Proposed Action, including construction and operation of the Crystal Springs Hatchery and permanent weir facilities on the Yankee Fork and Panther Creek (Alternative 1), an alternative that includes the hatchery and temporary weir facilities on Yankee Fork and Panther Creek (Alternative 2), and the No Action Alternative. Under operation of the hatchery (Alternatives 1 and 2), two production level options are considered: the proposed production level, and a 50% production level for Chinook salmon. The Proposed Action and action alternatives are described in more detail in Chapter 2, *Alternatives, Including the Proposed Action*, of this EIS.

## ES.5.1 Alternative 1 (Proposed Action)

Under Alternative 1 (the Proposed Action), BPA would fund the Tribes' construction and operation of the Crystal Springs Hatchery to produce Snake River spring/summer Chinook salmon and Yellowstone cutthroat trout. The Hatchery Program would be consistent and has been developed from the Tribes' Master Plan (Shoshone-Bannock Tribes 2011). The Hatchery Program would include construction of a new hatchery facility at Crystal Springs in Bingham County, Idaho, and two fish trapping weirs in the Salmon-Challis National Forest—one at the USFS Cobalt Work Center on Panther Creek (a tributary of the Salmon River in Idaho) and one at Pole Flat Campground in the Yankee Fork (also a tributary to the Salmon River in Idaho) (see Figure ES-1).

The Hatchery Program would involve the collection of Chinook salmon broodstock at the weirs and production of up to one million Chinook salmon smolts for release in Yankee Fork (up to 600,000) and Panther Creek (up to 400,000) to provide harvest opportunities for Tribal and non-tribal fishers in the basin, and to restore naturally spawning salmon populations.[2] The funding would also support the production of 5,000 Yellowstone cutthroat trout for planting within the Tribes' reservation in southern Idaho.

A second option has been developed for the Proposed Action that considers a 50% reduced production of Chinook salmon alternative for both the Yankee Fork and the Panther Creek weir facilities (the Yellowstone cutthroat trout program would not be reduced in size). The primary purpose for engaging in production actions in both Yankee Fork and Panther Creek watersheds is to increase abundance to support Tribal treaty harvest. By reducing production by 50%, the number of returning adults would be reduced accordingly. The 50% production option would, therefore, not support the Tribes' purpose to recolonize habitat by increasing the abundance of natural spawners in Yankee Fork and Panther Creek. Further, it would not meet NMFS' purpose and need to ensure

[2] Note that because natural-origin returns to Yankee Fork and Panther Creek are so low (less than 50 fish annually), taking fish out of these low populations for broodstock would not leave enough natural-origin fish for spawning. Consequently, a phased broodstock collection would be implemented under all alternatives (Shoshone-Bannock Tribes 2010a).

the sustainability and recovery of Snake River spring/summer Chinook salmon because the natural-origin abundance would be reduced by taking broodstock from lower adult returns.

### ES.5.2 Alternative 2

A second alternative has been developed for this EIS (Alternative 2), which is capable of accomplishing the goals for the Hatchery Program. All hatchery facilities described in the Proposed Action alternative would remain intact under this alternative, including both the full production and the 50% production of Chinook salmon options. The production goals, phases, and operations would be the same as described above. The only changes from the Proposed Action alternative would be to the adult trapping and holding facilities at Yankee Fork and Panther Creek. Rather than constructing permanent weir facilities at Yankee Fork and Panther Creek, temporary weir facilities would be installed at these sites instead under Alternative 2.

### ES.5.3 No Action Alternative

Under the No Action alternative for the project, BPA would not fund the proposed Hatchery Program, including the construction of the hatchery and weir facilities. The Hatchery Program would not produce Chinook salmon smolts for the Yankee Fork or Panther Creek, or produce Yellowstone cutthroat trout for release within the boundaries of the Fort Hall Reservation. No new construction would take place on USFS land within the Panther Creek watershed in connection with the Hatchery Program. Ongoing actions at the temporary satellite facility on the Yankee Fork would continue to operate under the existing authorization through 2016 and then cease. Current Chinook salmon production not associated with the proposed Hatchery Program would continue through separate Tribal programs as funding or excess stock is available for release of hatchery fish to the Yankee Fork or Panther Creek.

## ES.6 Summary of Environmental Effects and Mitigation Measures

This Draft EIS analyzes potential impacts associated with construction and operation of the Proposed Action (Alternative 1 with full production) and action alternatives (Alternative 2 and No Action Alternative) for the following environmental resource areas: *land use and recreation, transportation, geology and soils, vegetation, groundwater and surface water quality and quantity, wetlands and floodplains, fish, wildlife, cultural resources, socioeconomics and environmental justice, air quality and climate change, visual quality, noise, and public health and safety*.

Table ES-2 summarizes the environmental impacts of Alternative 1, Alternative 2, and the No Action Alternative. Table ES-2 also summarizes environmental impacts associated with the full production level for Chinook salmon, as well as the 50% production level for Chinook salmon, under Alternatives 1 and 2.

Table ES-3 summarizes potential mitigation measures that will be implemented to avoid or minimize environmental impacts. A more detailed discussion of impacts and mitigation measures is presented in Chapter 3, *Affected Environment and Environmental Consequences*.

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**Table ES-2. Summary of Environmental Project Impacts for the Crystal Springs Hatchery Program**

| Impact | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| Section 3.1, Land Use and Recreation | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Changes in Land Use and Recreational Use | ***Crystal Springs Hatchery:***<br>There would be ***no adverse impacts*** on land use and recreation, and long-term ***low*** beneficial recreational impact due to the increase in interpretive recreation at the new visitor viewing area, enhanced Yellowstone cutthroat trout fishery in Fort Hall Bottoms, and increased opportunity for Upper Salmon basin anglers. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>New facilities construction at Yankee Fork would be a ***low*** land use impact, approved and conditioned by a USFS special use permit. Construction would have a ***moderate*** impact on recreational use of Pole Flat Campground at the Yankee Fork site, which would be mitigated per USFS direction. Construction would have an impact on kayakers (***moderate*** impact at Yankee Fork, ***low*** impact at Panther Creek), as any kayakers running the river would be required to portage around the construction site. Construction at the Panther Creek site would entail temporary closures (periods of no more than an hour) of the Panther Creek road for several weeks during the peak recreational season in order to install a water line. Although mitigation (i.e. appropriate signage) would be implemented, this would result in a ***moderate*** impact on recreational users.<br>Operation of the Crystal Springs Hatchery Program would have a ***low*** beneficial recreational impact on recreation as the program would increase Chinook salmon recreational fishing opportunities and provide interpretive information for recreation users. Operation would also have an impact on kayakers (***moderate*** impact | ***Yankee Fork and Panther Creek:***<br>Same as full production, except the beneficial impacts on the Chinook salmon recreational fishery would be somewhat reduced, resulting in a ***low*** beneficial impact. | ***Yankee Fork and Panther Creek:***<br>Because no construction is proposed, there would be ***no land use impacts*** and no construction impacts on recreational uses.<br>There would be operational impacts on recreation (***moderate*** impact at Yankee Fork, ***low*** impact at Panther Creek), primarily by requiring kayakers to portage around the temporary weirs during operation. Operation of the Crystal Springs Hatchery Program would have a ***low*** beneficial impact on the Chinook salmon recreational fishery. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 2, full production, except the beneficial impacts on the Chinook salmon recreational fishery would be somewhat reduced, resulting in a **low** beneficial impact. | ***Yankee Fork and Panther Creek:***<br>No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | at Yankee Fork, ***low*** impact at Panther Creek), as any kayakers running the river would be required to portage around the weirs. | | | | |
| Wild and Scenic Rivers: Free-Flowing Character and Recreational ORV | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork and Panther Creek, the proposed weir facilities would be consistent with the free flowing character for rivers proposed under the Recreation outstandingly remarkable value (ORV). The proposed structures, however, would create a ***low*** localized impact on recreational use. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1, except the proposed temporary weir facilities would be in the stream channel for only part of the year, and being temporary, would not affect potential for Yankee Fork's and Panther Creek's future designation as a Wild and Scenic River. The temporary weir facilities, however, would be in place during the time of the year when the streams are most likely to receive recreational use and, therefore, would create a ***low*** localized impact on recreation. | ***Yankee Fork and Panther Creek:*** Same as full production | ***Yankee Fork and Panther Creek:*** No changes. |
| Section 3.2, Transportation | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork:*** Low; ***Panther Creek:*** High | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork:*** Low; ***Panther Creek:*** High | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Alteration of Road Safety, Capacity, and Accessibility | ***Crystal Springs Hatchery:*** Construction could cause delays when trucks enter and leave the site, which would be minimized by posting flaggers and considered a ***low*** impact. All other construction and operations impacts would be ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork, construction of the proposed facilities would entail short traffic delays, which is considered a ***low*** impact. At Panther Creek, construction of the proposed facilities would entail moderate traffic delays, with no reasonable detour alternative. Although mitigation (i.e., appropriate signage), would be implemented, this is considered a ***high*** impact. Proposed work would maintain or improve operational road safety at the Yankee Fork site (a ***low*** beneficial impact), and would maintain operational road safety at the Panther Creek site (a ***low*** impact). All other construction and operations impacts would be ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no construction impacts*** on transportation. Operations impacts would be ***low***, needing no mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| **Section 3.3, Geology and Soils** | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects on Geology and Soils in Terrestrial Settings: Seismic Risk, Slope Instability, Soil Settlement, and Soil Depletion or Erosion | ***Crystal Springs Hatchery:***<br>Project design measures would be implemented to minimize risks of seismic impacts, soils settlement, and soil depletion to ***low*** levels. New site infrastructure, however, could concentrate flows that could have a ***low*** impact on soil erosion. The site has no potential for slope instability. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Project design measures would be implemented to minimize risks of seismic impacts, soils settlement, and soil depletion to ***low*** levels. The site has no potential for slope instability. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Due to the absence of permanent structures, the impact potential on geology and soils is ***low***. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Effects on Geology and Soils in Fluvial Settings: Channel Migration, Sedimentation, Channel Scour | ***Crystal Springs Hatchery:***<br>The site has no potential for fluvial impacts. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Project design measures would be implemented to minimize risk of sedimentation and channel scour to ***low*** levels. The sites have a ***low*** potential for channel migration. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Due to the absence of permanent structures, the impact potential on geology and soil is ***low***. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Wild and Scenic Rivers: Geology ORV | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. |
| | ***Yankee Fork and Panther Creek:***<br>Construction and operation at the Yankee Fork and Panther Creek sites would have a ***low*** impact on the streams' Geology ORV. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| **Section 3.4, Vegetation** | | | | | |
| Overall Potential Impact | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Facility Construction on Vegetation | ***Crystal Springs Hatchery:***<br>***Low*** impacts due to the loss of low-value vegetation types would be minimized by implementing project design measures and by replanting and restoration in temporarily disturbed areas. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>***Low*** impacts due to the loss of primarily low-value vegetation types | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Due to absence of clearing and grading activity, construction impact potential | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | would be minimized by implementing project design measures and by replanting and restoration in temporarily disturbed areas. | | would be ***low***. | | |
| Effects of Facility Operations on Vegetation | ***Crystal Springs Hatchery:*** ***Low*** impacts would be minimized by monitoring and control of noxious weeds. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** ***Low*** impacts would be minimized by implementing USFS-required general weed prevention practices. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.5, Groundwater and Surface Water Quality and Quantity | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Construction on Surface and Groundwater Quality | ***Crystal Springs Hatchery:*** ***Low*** increases in turbidity could occur following rainfall events. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** ***Low*** increases in turbidity would occur during in-channel work. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Facility Discharges on Nutrient Levels in Basin Waters and Disposal of Carcasses | ***Crystal Springs Hatchery:*** The hatchery discharge would contain ***low*** concentrations of nutrients derived from fish waste and excess feed. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** At Panther Creek, the feeding of smolts would cause very ***low*** discharges of nutrients. Smolts would not be fed at Yankee Fork.<br>After spawning, the carcasses of the adult salmon would be distributed upstream of the weirs. Marine-derived nutrients from fish carcasses would provide a ***low to moderate*** beneficial impact in Yankee Fork and Panther Creek. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Contaminants in Hatchery Discharges on River Water Quality | ***Crystal Springs Hatchery:*** Hatchery effluent would sometimes contain therapeutic chemicals at very ***low*** concentrations. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** Adult holding pond effluent would sometimes contain therapeutic chemicals at very ***low*** concentrations. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| Effects on Water Quality of Stormwater Runoff | ***Crystal Springs Hatchery:*** Construction limits would be delineated within 200 feet of streams, other water bodies and wetlands; BMPs would be implemented to control erosion and stormwater and to eliminate discharge into waterways and wetlands; therefore, impacts would be ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** Construction limits would be delineated within 200 feet of streams, other water bodies and wetlands; BMPs would be implemented to control erosion and stormwater and to eliminate discharge into waterways and wetlands; therefore, impacts would be ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Surface Water Withdrawals on Surface Water Quantity | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** There would be no consumptive use, but some ***low***, localized impacts on surface water flow in the diverted reaches. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Water Withdrawals on Groundwater Supply | ***Crystal Springs Hatchery:*** ***Low***, localized withdrawals of groundwater from the East Snake Plain Aquifer would occur, under an existing water right. This impact is considered ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Wild and Scenic Rivers: Free-Flowing Character | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork, construction impacts on the stream's free-flowing character would be ***low*** due to the implementation of applicable mitigation measures; there would be no operational impacts at the Yankee Fork facility. At Panther Creek, construction impacts on the stream's free-flowing character would be ***low*** due to the implementation of applicable mitigation measures; however, the | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | non-consumptive diversion of water from a short section of stream channel would be considered a ***moderate*** impact. | | | | |
| Section 3.6, Wetlands and Floodplains | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Facility Construction on Wetlands and Floodplains | ***Crystal Springs Hatchery:***<br>Project design measures would minimize wetland fill (0.002 acre), which is considered a ***low*** impact. Best management practices would be implemented to minimize potential impacts on water quality in wetlands, a ***low*** impact. The site has no floodplains. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Due to the small area affected and the use of remediation measures, permanent construction impacts on wetlands would be ***low***. Channel diversion and dewatering at the weir sites would cause a ***moderate***, temporary impact, minimized by timing and revegetation of the affected area. Best management practices would be implemented to minimize potential impacts on water quality in surface waters, a ***low*** impact. The placement of permanent weir structures in the floodplain would have an overall ***low*** impact on flood flows. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Because of the absence of permanent structures, construction impacts on wetlands and floodplains would be ***low***. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Effects of Facility Operation on Wetlands and Floodplains | ***Crystal Springs Hatchery:***<br>Facility groundwater pumping and discharge of facility stormwater would pose a ***low to no*** impact on wetlands. The site has no floodplains. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>At the Yankee Fork and Panther Creek sites, there would be a ***low*** impact potential from stormwater runoff into surface waters. There would also be a ***low*** impact potential on floodplains, since structures would not be in-water during seasonal peak flows. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Section 3.7, Fish | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |

| Impact | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| Construction and Maintenance Effects on ESA-Listed and Other Fish | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Diversion of water to isolate in-channel work areas, occurring only during in-water construction windows for protection of salmonids, would cause a ***low***, temporary impact.<br><br>Handling of fish caught and passed at the weirs would have ***low*** impacts on fish. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Low impacts from handling of fish caught and passed at the weirs. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Surface Water Withdrawal on ESA-listed and Other Fish | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** Slightly reduced flow in the Yankee Fork and Panther Creek reach from the facility diversion to the facility outflow would cause a ***low***, minor, local impact. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Broodstock Collection at Adult Traps | ***Yankee Fork and Panther Creek:*** Short delays (several hours) would occur in bull trout and Chinook salmon migration during weir operations. Handling of these species would also cause stress and possible injury during weir operations. However, the Tribes would implement a fish-handling plan to minimize migration delay and handling impacts on non-target species, resulting in a ***low*** impact from broodstock collection. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** With temporary weirs, the same potential for delays and handling impacts could occur and similar methods for minimizing delay and handling stress would be implemented, resulting in ***low*** potential for impacts from broodstock collection | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts |
| Competition Between Naturally Produced Spring-run Chinook Salmon and ESA-Listed Fish in the Salmon River Basin | ***Yankee Fork and Panther Creek:*** Studies of competitive interactions between introduced juvenile spring Chinook salmon and native steelhead in the in the effected basins indicate that the impacts on juvenile steelhead productivity would likely be ***low***.<br>Juvenile spring Chinook could be prey for juvenile bull trout, but increased numbers of adult Chinook could out-compete bull trout for spawning areas if habitat were limited. | ***Yankee Fork and Panther Creek:*** Impacts of straying would be reduced compared to full production because of the lower production of Chinook salmon in Yankee Fork and Panther Creek. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Impacts of straying would be reduced compared to full production because of the lower production of Chinook salmon in Yankee Fork and Panther Creek. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Straying | ***Yankee Fork and Panther Creek:*** A ***low*** incidence of straying would be expected due to Crystal Springs Hatchery Program design features. | ***Yankee Fork and Panther Creek:*** Impacts would be further reduced compared to full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Incidental Harvest | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** |

| Impact | Alternative 1: Full Production | Alternative 1: 50% Production | Alternative 2: Full Production | Alternative 2: 50% Production | No Action Alternative |
|---|---|---|---|---|---|
| on ESA-Listed Fish | Some incidental mortality of steelhead and bull trout would occur when harvesting for Chinook salmon; however, the numbers affected would not exceed levels acceptable to fisheries agencies, a ***low*** impact. | Impacts of incidental harvest would be reduced compared to full production. | Same as Alternative 1. | Same as Alternative 1. | No impacts. |
| Wild and Scenic Rivers: Fish ORV | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork and at Panther Creek, the purpose of the Crystal Springs Hatchery Program is to restore and maintain fish runs, which thereby supports the Fish ORV for these streams, a **low** beneficial impact on fish. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.8, Wildlife | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Facility Construction on Special-Status Wildlife | ***Crystal Springs Hatchery:*** Implementing project design measures, construction timing restrictions, and revegetation practices would minimize risk of impacts related to the removal of low-quality wildlife habitat and generation of noise associated with construction work, ensuring impacts on wildlife and wildlife habitat are ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Implementing project design measures, construction timing restrictions, and revegetation practices would minimize risk of impacts related to the removal of low-quality wildlife habitat, temporary diversion of the stream channel, and generation of noise associated with construction work, ensuring impacts on wildlife and wildlife habitat are ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because of the absence of permanent structures, construction impacts on wildlife and wildlife habitat would be ***low.*** | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Facility Operations on Special-Status Wildlife | ***Crystal Springs Hatchery:*** Project design measures would minimize the risk of impacts associated with operational activity, noise, light, and hazing, resulting in ***low*** impacts on wildlife. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Project design measures would minimize the risk of impacts | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| | associated with operational activity and hazing, resulting in ***low*** impacts on wildlife. | | | | |
| Wild and Scenic Rivers: Wildlife ORV | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. |
| | ***Panther Creek:*** By increasing Chinook salmon abundance in Panther Creek, the proposed weir facility would result in a long-term ***low*** beneficial impacts on the Wildlife ORV. | ***Panther Creek:*** Not applicable. | ***Panther Creek:*** Same as Alternative 1. | ***Panther Creek:*** Not applicable. | ***Panther Creek:*** No impacts. |
| Section 3.9, Cultural Resources | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low |
| Loss or Alteration of Cultural Resources | ***Crystal Springs Hatchery:*** Construction and operation of the hatchery would result in ***low*** impacts on a nearby former fish hatchery. Minimization measures would be implemented to reduce impacts on cultural resources. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Construction and operation of the weir facilities would result in ***low*** impacts on historic cultural resources near the Yankee Fork and Panther Creek sites. Minimization measures would be implemented if any cultural resources are discovered during site construction. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Construction and operation of the weir facilities would result in ***low*** impacts on historic cultural resources near the Yankee Fork and Panther Creek sites. Because no construction is proposed, there would be no accompanying mitigation measures. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Wild and Scenic Rivers: History ORV | **Crystal Springs Hatchery:** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. |
| | ***Yankee Fork:*** There would be ***no adverse impacts*** on cultural or historic resources that would affect Yankee Fork's eligibility as a Wild and Scenic River. Operations at the weir facility would, however, result in ***low*** beneficial impacts on the Tribes' cultural values as they relate to fish and fish harvesting, which would have a ***low*** beneficial impact on Yankee Fork's eligibility as a Wild and Scenic River. ***Panther Creek:*** Not applicable. | ***Yankee Fork:*** Same as full production. ***Panther Creek:*** Not applicable. | ***Yankee Fork:*** Same as Alternative 1. ***Panther Creek:*** Not applicable. | ***Yankee Fork:*** Same as Alternative 1. ***Panther Creek:*** Not applicable. | ***Yankee Fork:*** No impacts. ***Panther Creek:*** Not applicable. |

| Impact | Alternative 1 Full Production | Alternative 1 50% Production | Alternative 2 Full Production | Alternative 2 50% Production | No Action Alternative |
|---|---|---|---|---|---|
| Section 3.10, Socioeconomics and Environmental Justice | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low impact<br>***Yankee Fork and Panther Creek:*** Low impact | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low impact<br>***Yankee Fork and Panther Creek:*** Low impact | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Moderate impacts to tribal treaty rights and an environmental justice population (Shoshone-Bannock Tribal members)<br>***Yankee Fork and Panther Creek:*** Moderate |
| Condition of Socioeconomic Resources | ***All Proposed Facilities:***<br>Construction and operation of the Crystal Springs Hatchery Program would have ***low*** impacts on population, employment, income, government revenue, housing, and public services and infrastructure. Fish production would support new and expanded recreational and tribal fisheries in the Upper Salmon River, which would have a ***low*** beneficial impact on the economic, cultural, and spiritual/tribal value of Chinook salmon. | ***All Proposed Facilities:***<br>Same as full production; however, the benefits of fish production would be diminished in proportion to the relative decrease of adult Chinook salmon in Yankee Fork and Panther Creek. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Fish production anticipated under Alternatives 1 and 2 would not occur, diminishing opportunities for new and expanded recreational and tribal fisheries in the Upper Salmon River. This would have a ***moderate*** impact on the economic, cultural, and spiritual/tribal value of Chinook salmon. |
| Environmental Justice Considerations | ***All Proposed Facilities:***<br>No adverse impacts are identified. The production of Chinook salmon and Yellowstone cutthroat trout would have a ***low*** beneficial impact on minority and low-income populations associated with the Shoshone-Bannock Tribes and the Fort Hall Indian Reservation. | ***All Proposed Facilities:***<br>Same as full production; however, the benefits of fish production would be diminished in proportion to the relative decrease of adult Chinook salmon in Yankee Fork and Panther Creek. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Fish production anticipated under Alternatives 1 and 2 would not occur, resulting in a ***moderate*** impact on minority and low-income populations associated with the Shoshone-Bannock Tribes and the Fort Hall Indian Reservation. |
| Section 3.11, Air Quality and Climate Change | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Adverse Impacts on Air Quality | ***Crystal Springs Hatchery:***<br>Construction impacts, primarily dust and vehicle emissions, would be mitigated to ***low*** levels. Operational impacts would be ***low*** due to the small size of the facility and low numbers of vehicle trips. | ***Crystal Springs Hatchery:***<br>Same as full production, although operational impacts could be slightly reduced. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Construction impacts, primarily dust and vehicle emissions, would be mitigated to ***low*** levels. Operational impacts would be ***very low*** due to the small size of the facility, limited operating season, and low numbers of vehicle trips. | ***Yankee Fork and Panther Creek:***<br>Same as full production, although operational impacts could be slightly reduced. | ***Yankee Fork and Panther Creek:***<br>Because no construction is proposed, there would be ***no construction impacts*** on air quality. Operational impacts would be ***very low*** due to the small size of the facility, limited operating season, and low numbers of vehicle trips. | ***Yankee Fork and Panther Creek:***<br>Same as full production, operational although impacts could be slightly reduced. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Greenhouse Gas Emissions | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** |

| Impact | Alternative 1 Full Production | Alternative 1 50% Production | Alternative 2 Full Production | Alternative 2 50% Production | No Action Alternative |
|---|---|---|---|---|---|
| | Greenhouse gas emissions from both construction and operations would be ***low***, even without implementing mitigation. | Same as full production, although operational impacts could be slightly reduced. | Same as Alternative 1. | Same as Alternative 1. | No impacts. |
| | ***Yankee Fork and Panther Creek:*** Greenhouse gas emissions from both construction and operations would be ***low***, even without implementing mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production, although operational impacts could be slightly reduced. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no construction impacts*** associated with greenhouse gas emissions. Due to the operational nature of the temporary weir structures, greenhouse gas emissions associated with operations at these facilities would also be ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.12, Visual Quality | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Changes in Visual Resources | ***Crystal Springs Hatchery:*** Construction would have a ***low***, temporary impact not requiring mitigation. Operations would produce potential glare and night lighting from new structures; however, implementing mitigation would reduce these impacts to a ***low*** level. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Construction would have a ***low***, temporary impact not requiring mitigation. Operations would produce potential glare and coloration impacts from new structures; however, implementing mitigation would reduce these impacts to a ***low*** level. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***low*** impacts on visual resources. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Wild and Scenic Rivers: Scenery ORV | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Because the proposed weir facility would be painted and textured to be consistent with existing structures nearby, is located in a confined canyon with minimal views of the background scenery, and interpretive signs would be added to benefit scenery and recreation, impacts on the Scenery ORV would be ***low***. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Same as full production. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Same as Alternative 1. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Same as Alternative 1. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** No impacts. |
| Section 3.13, Noise | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Generation of Noise | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** | ***Crystal Springs Hatchery:*** |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | Both construction and operations would have ***low*** impacts related to noise, requiring no mitigation; however, best management practices are recommended to further reduce impacts. | Same as full production. | Same as Alternative 1. | Same as Alternative 1. | No impacts. |
| | ***Yankee Fork and Panther Creek:*** Construction noise would be intermittently discernible at Pole Flat Campground (Yankee Fork site) and at the USFS Panther Creek housing units; however, these are ***low*** impacts requiring no mitigation, although best management practices are recommended to further reduce impacts. Operational noise would be ***low***, requiring no mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Since no construction is proposed, there would be no construction impacts. Operations noise would be ***low***, needing no mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.14, Public Health and Safety | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Moderate | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Moderate | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Creation of Infrastructure and Environmental Hazards | ***Crystal Springs Hatchery:*** Risks associated with infrastructure and environmental hazards during construction would be ***low*** by incorporating facility design to minimize risks, selecting appropriately qualified construction workers, complying with federal and state safety standards, and implementing best management practices. Operational impacts would include risks to hatchery workers, which would be minimized by hiring appropriately qualified workers and complying with federal and state safety standards, resulting in ***low*** impacts on public health and safety associated with infrastructure and environmental hazards. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Risks associated with infrastructure and environmental hazards during construction would be ***low*** with implementation of best management practices. Operational impacts would include risks to Tribal workers while trapping fish, which would be minimized by worker training and implementing several strategies to | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be no construction risks associated with infrastructure and environmental hazards. Operational impacts would be **moderate** due to risks associated with installation, maintenance, and removal of the temporary weirs. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | minimize the risks associated with working in and near a river. Chain link fences, gates, and signage would minimize public health and safety risks of the permanent weir facilities to the general public. The overall resulting impacts would be ***low***. | | | | |
| Use of Hazardous Materials | ***Crystal Springs Hatchery:*** Risks associated with the use of hazardous materials during construction would be minimized by implementing measures identified in a spill control containment and countermeasures plan; resulting in ***low*** impacts on public health and safety. Risks associated with the use and storage of hazardous materials during hatchery operations would be minimized by facility design, complying with federal and state safety standards, and implementing best management practices, resulting in ***low*** impacts on public health and safety. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Risks associated with the use of hazardous materials during construction would be minimized by implementing measures identified in a spill control containment and countermeasures plan; resulting in ***low*** impacts on public health and safety. Risks associated with the use and storage of hazardous materials during weir operations, such as formalin, would be minimized by facility design, complying with federal and state safety standards, and implementing best management practices, resulting in ***low*** impacts on public health and safety. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no*** *construction impacts* associated with the use of hazardous materials. During weir operations, small amounts of hazardous materials, such as fish anaesthetic, would be used at the site resulting in ***low*** *operational impacts* associated with the use of hazardous materials. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Use of Energy Sources | ***Crystal Springs Hatchery:*** Small amounts of electricity and fuels would be used for a short duration during construction, resulting in ***low*** impacts on local energy sources. The amount of electricity needed to supply hatchery operations would be minimal and should have ***low*** impacts on the local availability of electricity. The amount of fuel needed for vehicle use | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| | at the hatchery is anticipated to be a fraction of the total amount of fuel sold in Idaho and should have ***low*** impacts on fuel supplies. | | | | |
| | ***Yankee Fork and Panther Creek:*** Small amounts of electricity and fuels would be used for a short duration during construction, resulting in ***low*** impacts on local energy sources. The amount of electricity needed to supply the proposed permanent weir facilities would be minimal and should have ***low*** impacts on the local availability of electricity. The amount of fuel needed for vehicle use at the weir facilities is anticipated to be a fraction of the total amount of fuel sold in Idaho and should have ***low*** impacts on fuel supplies. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no*** construction impacts on local supplies of electricity and diesel. During operations, electricity would not be needed at the temporary weir facilities and, therefore, would ***not impact*** the local availability of electricity. The amount of fuel needed for vehicle use at the temporary weir facilities is anticipated to be a fraction of the total amount of fuel sold in Idaho and should have ***low*** impacts on fuel supplies. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |

**Table ES-3. Summary of Mitigation Measures for Alternative 1 and Alternative 2**

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| Section 3.1, Land Use and Recreation | | |
| Construction | **Crystal Springs Hatchery**<br>Mitigation would not be required during construction of the Crystal Springs hatchery.<br>**Yankee Fork Weir Facility**<br>Minimize disruption and adverse impacts on the customary users of the Pole Flat Campground and picnic area near Yankee Fork weir facility during construction by implementing the following measures:<br>● Coordinate with USFS staff to ensure access to the campground is maintained for as much time as is possible and reasonably safe. Consult with USFS to determine if temporary closure would be less disruptive.<br>● If facilities are temporarily or permanently relocated, signage for new or alternate facilities should be clearly posted.<br>● Coordinate with USFS staff to schedule construction activities to coincide with lower-use periods during the recreational season (e.g., on weekdays, or during less favorable fishing and boating conditions).<br>● Coordinate with USFS staff to minimize noise and visual disruption to recreational users by efficiently scheduling construction activities and staging work areas away from recreational areas to the greatest extent possible.<br>● Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of in-water construction and provide portage instructions.<br>**Panther Creek Weir Facility**<br>Use temporary signage to warn vehicles traveling through the area of increased construction traffic near the Panther Creek site under Alternative 1. See Section 3.2, *Transportation*, for additional mitigation measures to address safety concerns and road closure on Panther Creek Road.<br>Coordinate with USFS staff to determine if signage or other | **Crystal Springs Hatchery**<br>Mitigation would not be required during construction of the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is proposed. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | measures are necessary to warn boaters on Panther Creek of in-water construction. Implement safety measures as needed. | |
| Operations | **Crystal Springs Hatchery**<br>Mitigation would not be required during operation of the Crystal Springs hatchery.<br>**Yankee Fork Weir Facility**<br>Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of the presence and seasonal use of the weir and provide portage instructions.<br>**Panther Creek Weir Facility**<br>Coordinate with USFS staff to determine if signage or other measures are necessary to warn boaters on Panther Creek of seasonal use of in-water structures. Implement safety measures as needed. | **Crystal Springs Hatchery**<br>Mitigation would not be required during operation of the Crystal Springs hatchery.<br>**Yankee Fork Weir Facility**<br>Coordinate with USFS staff to identify ways to offset occupation of campsites at Pole Flat Campground if permanent reservation is required, or minimize temporary occupation of campsites during periods of high demand.<br>Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of the seasonal use of the weir and provide portage instructions.<br>**Panther Creek Weir Facility**<br>Implement the same mitigation recommended under Alternative 1 for the Panther Creek weir facility. |
| Section 3.2, Transportation | | |
| Construction | **Crystal Springs Hatchery**<br>Northbound traffic that approaches the Crystal Springs hatchery site from the south would need signage because of limited visibility while approaching the site. Signs would be placed well in advance of the site to make oncoming traffic slow down. Additional signage and flaggers would be used when oncoming traffic needs to come to a complete stop to accommodate construction trucks entering or leaving the facility.<br>**Yankee Fork Weir Facility**<br>Flaggers in the road during construction would help halt traffic while trucks pull into or out of the worksite to help slow traffic and limit risk of collisions. Traffic safety impacts from the interaction of fast-moving vehicles and construction crews would be mitigated by providing adequate signage and warning of the need for cars to slow or stop in advance of the site in order to allow construction trucks to enter or leave the site.<br>**Panther Creek Weir Facility**<br>Flaggers in the road during construction would help halt traffic | **Crystal Springs Hatchery**<br>Implement the same mitigation measures recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | while trucks pull into or out of the worksite to help slow traffic and limit risk of collisions. Traffic safety impacts from the interaction of fast-moving vehicles and construction crews can be mitigated by providing adequate signage and warning of the need for cars to slow or stop in advance of the site in order to allow construction trucks to enter or leave the site.<br>In order to mitigate the impacts of closure during the two-to-three-week period, facility designers would first consider whether construction work could be done in a manner that does not require full closure (e.g., by opening a temporary route around the roadwork).<br>If full closure is required, the impact would be mitigated by providing advance notification to affected parties (primarily people pursuing outdoor recreation) and by scheduling the closure in the lowest-use time of the season. Scheduling the closure before October would avoid interrupting the usage of the road by hunters. While precise traffic volume estimates are not available to determine the time of year with the lowest volume, interviews with members of the outdoor recreation community in the region may demonstrate when access to those sections of the forest are the most important. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| Operations | Impacts during operation at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites are considered low; no mitigation is required. | Impacts during operation at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites are considered low; no mitigation is required. |
| Section 3.3, Geology and Soils | | |
| Construction | **Crystal Springs Hatchery Site**<br>Implement the following mitigation measures to reduce construction-related impacts on geology and soils at the Crystal Springs hatchery site.<br>● Silty sand and sand with gravel at the site would be reused as structural fill if it meets certain requirements outlined in the geotechnical engineering report, especially if the earthwork is conducted during dry weather.<br>● The topsoil at the site is not suitable for use as structural fill or to bear structures. Therefore, it would be excavated, removed, and stockpiled for reuse as landscape fill (which would minimize soil resource depletion) or removed from the site. The extent of reuse of on-site soils would be determined during construction. There is potential to reuse excavated material at the outdoor tank area and for some of the minor road fills for the residence drives.<br>● The design would maximize use of pervious gravel instead of impervious concrete for the constructed surfaces. This would retain a large portion of site infiltration capacity, thereby limiting increased stormwater runoff that could result in increased soil erosion.<br>● The hatchery would be constructed using standard erosion control measures and best management practices according to the guidelines of the Idaho Transportation Department (ITD) Sediment and Erosion Control Manual. Prior to construction, the contractor would submit an erosion and sediment control plan, signed and stamped by a registered civil engineer, that meets all federal, state, and local requirements. Specific erosion control measures for the hatchery site for Alternatives 1 and 2 are described in Appendix C. For additional information on the potential environmental consequences of soil erosion on water quality | **Crystal Springs Hatchery Site**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | and fish, see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, and Section 3.7, *Fish*.<br>● Shallow groundwater would likely be encountered, particularly during spring snowmelt, and any excavation extending below anticipated groundwater levels would incorporate a dewatering plan.<br>● Site excavations would be sloped in accordance with the Occupational Safety and Health Administration regulations and local codes.<br>● Construction activities, particularly earthwork, would be performed as rapidly as possible and/or during drier, low flow conditions (late summer and fall) to reduce the potential for remedial earthwork.<br>● The 2009 International Building Code (IBC) would be utilized for project structural design. Section 1615.1 of the 2009 IBC outlines the procedure for evaluating site ground motions and design spectral response accelerations recommend a Site Class D be utilized as a basis for structural seismic design.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the following mitigation measures to reduce construction-related impacts on geology and soils at the Yankee Fork and Panther Creek weir facilities.<br>● Shallow groundwater would likely be encountered, particularly during spring snowmelt, and any excavation extending below anticipated groundwater levels would incorporate a dewatering plan.<br>● Site excavations would be sloped in accordance with the Occupational Safety and Health Administration regulations and local codes.<br>● Construction activities, particularly earthwork, would be performed as rapidly as possible and/or during drier, low flow conditions (late summer and fall) to reduce the potential for remedial earthwork.<br>● Topsoil and soil containing significant vegetation and organics is not suitable for use as structural fill or to bear structures over. As such, it would be excavated, removed, | |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | and stockpiled for reuse as landscape fill, or removed from the site.<br>● The on-site silty gravel and poorly graded gravel with sand and silt would be reused as general structural fill provided it meets the requirements.<br>● Riprap or coarse alluvium would be placed next to the bridge weir abutments to protect against bank erosion and damage to the abutment. This would not protect against lateral migration that occurs upstream of the bridge weir. Riprap or other bank stabilization material could be extended further up the channel to provide additional bank protection. However, this may be unnecessary as the existing bridge a short distance upstream of the proposed weir may limit future migration in the bridge weir vicinity. | |
| Operations | **Crystal Springs Hatchery Site**<br>Implement the following mitigation measures to reduce operations impacts on geology and soils at the Crystal Springs hatchery site.<br>● To protect against potential soil erosion, a Stormwater Pollution Prevention Plan that meets the Environmental Protection Agency's erosion and stormwater control best management practices would be implemented and stormwater runoff from the site would be attenuated by being channeled through a concrete dual-chambered settling pond before being combined with overflow drains that would discharge through an approximately 180-foot-long pipe into McTucker Creek.<br>● The increase in flow to McTucker Creek due to hatchery operations would be expected to result in increased overbanking and ponding of water instead of increased channel velocities with the potential to erode the channel. Channel conditions in McTucker Creek would be visually monitored during operations to ensure that no adverse erosion is occurring due to the increased discharge. If erosion is detected, then appropriate response measures would need to be developed to avoid further erosion. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Scour is unlikely to occur under Alternative 2 since no permanent weir facility would be constructed. No mitigation would be required. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | **Yankee Fork and Panther Creek Weir Facilities**<br>The potential for bridge scour would be most likely to occur during the high-flow months when Panther Creek has the most energy. During high flows the concrete weir sill and abutments would be the only part of the bridge weir in place in the channel. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. No scour analysis was performed on the design; however, this configuration of the weir foundation would minimize scour and maintain the channel at the same approximate elevation. If scour were to become problematic, then riprap or coarse alluvium could be placed on the bed to protect the sill and abutments. | |
| Section 3.4, Vegetation | | |
| Construction | Implement the following mitigation measures to reduce construction-related impacts on vegetation at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites<br>● Explain vegetation-related mitigation measures to construction contractors and inspectors during a preconstruction meeting covering environmental requirements.<br>● Restrict construction activities to the area needed to work effectively to limit disturbance of native vegetation communities to the minimum amount necessary.<br>● Prior to construction, control noxious weeds either manually, mechanically, or chemically as recommended for each species, focusing on species with small, localized infestations to reduce the potential for widespread establishment and the need for long-term management.<br>● Use vehicle and equipment cleaning stations to minimize the spread of weeds to uninfected areas during construction by cleaning vehicles and equipment prior to entering and as soon as possible after leaving each work area.<br>● Use weed-free mulch and straw where such materials are needed for erosion control. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for construction of the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

<table>
<tr><th>Environmental Resource</th><th>Alternative 1</th><th>Alternative 2</th></tr>
<tr><td></td><td><ul><li>Use local sources of rock for road construction and obtain road fill materials from noxious weed-free quarries.</li><li>Reseed disturbed areas after construction is complete, at the appropriate time period for germination, with a native seed mix recommended by BPA or the Idaho State Department of Agriculture.</li><li>Monitor vegetation cover of seeded areas with at least three field visits per year until site stabilization (defined as at least 70% cover by plant species other than Idaho State Department of Agriculture-listed noxious weeds) is achieved; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.</li><li>Approximately 1 year after construction, conduct a noxious weed survey of all areas disturbed by construction activities to determine if there are new noxious weed infestations. Implement appropriate control measures of noxious weed infestations.</li><li>Implement applicable General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs included in the USDA–Forest Service Guide to Noxious Weed Prevention Practices into the construction and operation plans.</li></ul></td><td></td></tr>
<tr><td>Operations</td><td>Crystal Springs Hatchery<br>No mitigation is recommended during operation of the Crystal Springs hatchery.<br>Yankee Fork and Panther Creek Weir Facilities<br>Implement all applicable General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs included in the USDA–Forest Service Guide to Noxious Weed Prevention Practices into the construction and operation plans, as follows:<ul><li>Practice 1. Perform environmental analysis for projects and maintenance programs to assess weed risks, analyze potential treatment—including herbicides, if needed—of high-risk sites for weed establishment and spread, and identify prevention practices. Determine prevention and maintenance needs at the onset of project planning.</li></ul></td><td>Crystal Springs Hatchery<br>No mitigation is recommended during operation of the Crystal Springs hatchery.<br>Yankee Fork and Panther Creek Weir Facilities<br>Implement the same mitigation recommended under Alternative 1 for the Yankee Fork and Panther Creek weir facilities.</td></tr>
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| Environmental Resource | Alternative 1 | Alternative 2 |
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| | • **Practice 2.** Inventory and prioritize weed infestations for treatment in project operating areas and along access routes before ground-disturbing activities begin. Identify what weeds are on site, or within reasonably expected potential invasion vicinity, and conduct a risk assessment accordingly. Control weeds as necessary.<br>• **Practice 3.** Begin project operations in un-infested areas before operating in weed-infested areas.<br>• **Practice 4.** Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules is least likely.<br>• **Practice 7.** Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal consists of bagging the seeds and plant parts and incinerating them. | |
| Section 3.5, Groundwater and Surface Water Quality and Quantity | | |
| Construction | **Crystal Springs Hatchery Site**<br>Implement the following measures to reduce impacts on water quality and water quantity during construction at the Crystal Springs hatchery site.<br>• Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and sediment-laden waters are drained 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.<br>• 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.<br>• Wash heavy equipment that may work below the ordinary high water mark elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.<br>• Inspect equipment to remove vegetation and dirt clods that | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is required as the temporary weir would be placed and removed by hand and no water would be diverted or discharged. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | may contain noxious weeds.<br>● Inspect machinery daily for fuel or lubricant leaks.<br>● 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.<br>● To the greatest extent possible, minimize the size of construction disturbance areas and the removal of vegetation.<br>● 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.<br>● Implement a Spill Prevention, Control, and Countermeasures (SPCC) plan that requires storage of fuel and other potential pollutants in a secure location at least 300 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 requires 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 regulations.<br>● Restrict refueling and servicing operations to locations at least 300 feet from streams, water bodies, and wetlands where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes); use pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.<br>● Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of 300 | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | feet away from any stream, water bodies, or wetland.<br>● Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.<br>● Reseed disturbed areas after construction and regrading are complete at the appropriate time period for germination.<br>● Monitor germination of seeded areas; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.<br>● Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion levels.<br>● Comply with the construction National Pollutant Discharge Elimination System (NPDES) permit.<br>● Train all staff in regard to chemical handling and application safety.<br>● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.<br>Modeling has indicated that the use of groundwater at the Crystal Springs hatchery site would have a low impact on the aquifers. Observations at the Crystal Springs hatchery site have noted no change in artisanal water flow from the existing wells while the Springfield Hatchery has been operational; however, once pumps are installed and operational the Tribes would conduct a pump test on the proposed wells at the Crystal Springs hatchery site to determine actual effects on the groundwater resource during periods of peak water demand for fish rearing (March).<br>If water diversions to the hatchery result in reduced surface water levels in the existing ponds from the old hatchery, pond water levels would be maintained through placement of stop logs in the existing racks at the pond outlets.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the following measures to reduce impacts on water quality and water quantity during construction at the Yankee | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | Fork and Panther Creek weir facilities.<br>● Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and sediment-laden waters are drained 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.<br>● 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.<br>● Conduct in-water work during approved in-water work windows.<br>● Wash heavy equipment that may work below the ordinary high water mark elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.<br>● Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.<br>● Inspect machinery daily for fuel or lubricant leaks.<br>● 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.<br>● To the greatest extent possible, minimize the size of construction disturbance areas and the removal of vegetation.<br>● 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.<br>● Implement a SPCC plan that requires storage of fuel and other potential pollutants in a secure location at least 300 | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | 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 requires 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 regulations.<br>● Restrict refueling and servicing operations to locations at least 300 feet from streams, water bodies, and wetlands where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes); use pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.<br>● Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of 300 feet away from any stream, water bodies, or wetland.<br>● Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.<br>● Reseed disturbed areas after construction and regrading are complete at the appropriate time period for germination.<br>● Monitor germination of seeded areas; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.<br>● Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion levels.<br>● Comply with the NPDES permit.<br>● Comply with the Total Maximum Daily Load (TMDL) allocations for the American Falls Reservoir subbasin.<br>● Comply with all chemical handling, application, and disposal regulations by USDA and Center for Veterinary Medicine (CVM) regulations and other state and federal regulations to protect human and environmental health. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ● Train all staff in regard to chemical handling and application safety.<br>● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities. | |
| Operations | **Crystal Springs Hatchery**<br>Implement the following measures to reduce impacts on water quality and water quantity during hatchery operations at the Crystal Springs hatchery site.<br>● Comply with the NPDES permit for hatchery discharges.<br>● Comply with the TMDL allocations for the American Falls Reservoir subbasin.<br>● Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.<br>● Train all staff in regard to chemical handling and application safety.<br>● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.<br>Modeling has indicated that the use of groundwater at the Crystal Springs hatchery site would have a low impact on the aquifers. Observations at the Crystal Springs hatchery site have noted no change in artisanal water flow from the existing wells while the Springfield Hatchery has been operational; however, once pumps are installed and operational, the Tribes would conduct a pump test on the proposed wells at the Crystal Springs hatchery site to determine actual effects on the groundwater resource during periods of peak water demand for fish rearing (March).<br>If water diversions to the hatchery result in reduced surface water levels in the existing ponds from the old hatchery, pond water levels would be maintained through placement of stop logs in the existing racks at the pond outlets. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is required as the temporary weir would be placed and removed by hand and no water would be diverted or discharged. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | **Yankee Fork and Panther Creek Weir Facilities**<br>Implement the following measures to reduce impacts on water quality and water quantity during weir facility operations at the Yankee Fork and Panther Creek sites.<br>● Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.<br>● Train all staff in regard to chemical handling and application safety.<br>● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.<br>● If formalin is used, insure that the concentration of formalin in the discharge is at or below 1 mg/L. | |
| Section 3.6, Wetlands and Floodplains | | |
| Construction | **Crystal Springs Hatchery Site**<br>The following measures would be implemented at the Crystal Springs hatchery to minimize impacts on wetlands and floodplains.<br>• Review water quality mitigation measures, required BMPs, and permit requirements with construction contractors and inspectors during a preconstruction meeting covering environmental requirements.<br>• Implement an erosion control and sedimentation plan, which would include sedimentation and erosion control measures, such as silt fences, straw bales, and jute matting to prevent sediment from entering waterways and wetland habitats.<br>• Implement a fugitive dust control plan including the use of water trucks or other appropriate methods to control dust during construction, the use of gravel on access road surfaces in areas of sustained wind to reduce potential dust erosion, and the establishment of a 15-mile-per-hour speed limit for construction vehicle use on unpaved roads and | **Crystal Springs Hatchery Site**<br>The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | surfaces.<br>• Install signage, fences, and flagging to restrict work areas and confine vehicles and equipment to designated routes that avoid wetlands and waterways.<br>• When working next to wetlands and waterways, limit disturbance to the minimum necessary to achieve construction objectives, minimize habitat alteration, and limit the effects of erosion and sedimentation.<br>• Implement a SPCC plan in accordance with federal, state, and local requirements. At a minimum, the SPCC should address fuel and chemical storage, spill containment and cleanup, construction contractor training, and proper spilled material disposal activities.<br>• Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of 300 feet from any wetlands, streams, or other water bodies.<br>• Inspect machinery regularly for leaks.<br>• Revegetate temporarily disturbed areas with appropriate native species.<br>• Develop and implement a work area isolation/dewatering plan for instream work that includes provisions for erosion and sediment control.<br>• Check all equipment for leaks, and, prior to entering wetlands, waterways, or floodplains, and completely clean off any external petroleum products, hydraulic fluid, coolants, and other pollutants.<br>• Re-grade disturbed areas to pre-construction contours and revegetate with appropriate native species.<br>**Yankee Fork Weir Facility**<br>Implement the same mitigation measures recommended for construction of the Crystal Springs hatchery under Alternative 1.<br>**Panther Creek Weir Facility**<br>Implement the same mitigation measures recommended for construction of the Crystal Springs hatchery under Alternative 1. In addition, stockpile wetland soils removed from Wetland | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | Panther-A at the Panther Creek weir facility during diversion channel construction and use them to re-fill the channel once construction is completed. | |
| Operations | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1. | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1. |
| Section 3.7, Fish | | |
| Construction | **Crystal Springs Hatchery Site**<br>Water quality mitigation measures to protect fish during construction would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Crystal Springs hatchery site under Alternative 1. No other mitigation would be required.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Water quality mitigation measures to protect fish during construction would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Yankee Fork and Panther Creek weir facilities under Alternative 1. Additional mitigation would include implementation and compliance with a NMFS-approved fish salvage and relocation plan. In-water construction would also occur within approved in-water work windows. | **Crystal Springs Hatchery Site**<br>The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |
| Operations | **Crystal Springs Hatchery Site**<br>Water quality mitigation measures to protect fish during hatchery operations would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Crystal Springs hatchery site under Alternative 1. No other mitigation would be required.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Water quality mitigation measures to protect fish during weir facility operations would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Yankee Fork and Panther Creek weir facilities under Alternative 1.<br>Additional mitigation would include implementation and | **Crystal Springs Hatchery Site**<br>The same mitigation measures recommended for Alternative 1 operations at the Crystal Springs hatchery would also be implemented under Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is recommended; however, the Tribes would implement and comply with NMFS-approved fish handling plans, as well as comply with the annual Idaho Scientific Collection permits and NMFS Section 10 Scientific Research permits for the weir facilities. Captured fish would be transported by truck from the weir facilities, and no holding or acclimation would be required at the Yankee Fork and Panther Creek sites. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | compliance with a NMFS-approved fish handling plan during operation. The Tribes would also operate under the annual Idaho Scientific Collection permits and the NMFS Section 10 Scientific Research permits for the weir facilities.<br>Daily monitoring for bull trout congregating above and below the weirs would be conducted daily by the Tribes. If congregations are evident, a section of the weir would be opened to facilitate migration through the weir facility.<br>If formalin treatments are necessary, the discharge would be managed to ensure 1 milligram per liter or less would be discharged to Yankee Fork or Panther Creek. | |
| Section 3.8, Wildlife | | |
| Construction | The following measures apply to construction at the Crystal Springs hatchery, Yankee Fork and Panther Creek sites.<br>● Avoid clearing trees or other vegetation that may contain nesting migratory birds during the migratory bird nesting season, which may occur as early as January (primary for owls and hawks) and continue through July of any given year. Clearing may be conducted during the nesting season if nest sites are determined to be absent by a qualified biologist, and if approved by designated Idaho Fish and Game or U.S. Fish and Wildlife Service representatives.<br>● Erect temporary fencing around areas that are not to be disturbed to protect them during construction.<br>● Develop and implement a plan to revegetate temporarily disturbed areas to provide wildlife habitats and reduce the risk of weed encroachment.<br>**Crystal Springs Hatchery Site**<br>In addition to the measures listed above, implement the following measures at the Crystal Springs hatchery site to minimize impacts on wildlife.<br>• Minimize disturbance to big sagebrush vegetation cover type.<br>• Check for nesting birds in abandoned structures and do not demolish structures when active nests are present. | **Crystal Springs Hatchery Site**<br>The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

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<tr><th>Environmental Resource</th><th>Alternative 1</th><th>Alternative 2</th></tr>
<tr><td></td><td>Yankee Fork and Panther Creek Weir Facilities<br>No site-specific measures for weir facility operations, in addition to the measures already listed above, are recommended at the Yankee Fork and Panther Creek sites under Alternative 1.</td><td></td></tr>
<tr><td>Operations</td><td>The following measures apply to operations at the Crystal Springs hatchery, Yankee Fork and Panther Creek sites.<br>● Minimize lighting and use lighting fixtures that direct light downward and not towards off-site areas to minimize disturbance to wildlife.<br>● Install fish screens at water intake structures to minimize entrainment of aquatic species.<br>● Develop and implement a plan to minimize and manage predatory wildlife being attracted to fish and other potential food sources available at the facility.<br>Crystal Springs Hatchery Site<br>No site-specific measures for hatchery operations are recommended at the Crystal Springs hatchery site under Alternative 1.<br>Yankee Fork and Panther Creek Weir Facilities<br>At the Yankee Fork and Panther Creek weir facilities, develop a plan to avoid human/wildlife conflicts prior to distributing carcasses of spawned adults.</td><td>The same mitigation measures recommended for Alternative 1 operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would also be implemented under Alternative 2.</td></tr>
<tr><td colspan="3">Section 3.9, Cultural Resources</td></tr>
<tr><td>Construction</td><td>The following mitigation measures would be implemented to avoid or minimize impacts on cultural resources during construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:<br>● Mark known cultural resource sites as avoidance areas on construction drawings and flag as no-work areas in the field prior to construction.<br>● Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan.<br>● Protect any unanticipated cultural resources discovered during construction as follows:<br>○ Stop work in the immediate vicinity of the discovery and</td><td>The same mitigation described for construction of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1 would also be implemented for Alternative 2.</td></tr>
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| Environmental Resource | Alternative 1 | Alternative 2 |
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| | protect find in place.<br>○ Notify Tribes Project Manager, BPA Archaeologist, and BPA Environmental Compliance Lead immediately; for activities on Salmon-Challis National Forest Lands, notify the Forest Archaeologist.<br>○ Implement mitigation or other measures as instructed by BPA in consultation with the Tribes, Salmon-Challis National Forest, and Idaho State Historic Preservation Office. | |
| Operations | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1. | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 2. |
| Section 3.10, Socioeconomics and Environmental Justice | | |
| Construction/ Operations | The Hatchery Program is expected to result in **low** adverse or beneficial construction- and operations-related impacts on socioeconomic resources. Therefore, no mitigation measures are recommended for Alternative 1. | The Hatchery Program is expected to result in **low** adverse or beneficial construction- and operations-related impacts on socioeconomic resources. Therefore, no mitigation measures are recommended for Alternative 2. |
| Section 3.11, Air Quality and Climate Change | | |
| Construction | **Crystal Springs Hatchery Site**<br>The Tribes would implement the following best management practices to minimize air quality impacts associated with construction at the Crystal Springs hatchery:<br>● Sequence and schedule construction work to minimize the amount of bare soil exposed to wind erosion.<br>● Use water trucks to control dust during construction, as needed.<br>● If dust-abatement additives or stabilization chemicals (typically magnesium chloride, calcium chloride salts, or lignin sulfonate) are used, the following additional measures would be implemented:<br>○ Do not apply dust-abatement additives and stabilization chemicals within at least 25 feet of surface water (distances might be greater where vegetation is sparse) and apply them so as to minimize the likelihood that they would enter the water. | **Crystal Springs Hatchery Site**<br>The same mitigation measures recommended for Alternative 1 at the Crystal Springs hatchery site would also be implemented under Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ○ Do not use petroleum-based products for dust abatement.<br>○ Avoid application of dust abatement chemicals during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to surface water.<br>○ Ensure spill containment equipment is available during application of dust abatement chemicals.<br>● Transport all vegetation or other debris associated with construction clearing to an approved landfill or composting facility, as applicable. Burning of all such material would not be done; some small-scale vegetation burning may be done for weed control on access roads.<br>● Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.<br>● Implement vehicle idling restrictions.<br>● Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.<br>● Locate staging areas in previously disturbed or graveled areas, where practicable, to minimize soil and vegetation disturbance.<br>● Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel.<br>● Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.<br>● Reduce electricity use in the construction office by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.<br>● Recycle or salvage nonhazardous construction and demolition debris where practicable.<br><br>**Yankee Fork and Panther Creek Weir Facilities** | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | The same mitigation measures recommended for construction at the Crystal Springs hatchery would be implemented at the Yankee Fork and Panther Creek weir facilities. | |
| Operations | **Crystal Springs Hatchery Site**<br>The Tribes would implement the following best management practices to minimize air quality impacts associated with operations at the Crystal Springs hatchery:<br>● Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.<br>● Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.<br>● Implement vehicle idling restrictions.<br>● Reduce electricity use during facility operation by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.<br>● Recycle or salvage waste generated during facility operation, where practicable.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>The same mitigation measures recommended for Crystal Springs hatchery operations would be implemented at the Yankee Fork and Panther Creek weir facilities. | The same mitigation measures recommended for Alternative 1 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would also be implemented under Alternative 2. |
| Section 3.12, Visual Quality | | |
| Construction | No mitigation is recommended for construction activities at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site under Alternative 1. | No mitigation is recommended for construction activities at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site under Alternative 2. |
| Operations | **Crystal Springs Hatchery**<br>*Reduce Glare from Buildings and Apply Minimum Lighting Standards.* Use of similar building materials and colors to those found in nearby development would aid in helping the facility to blend with its local surroundings and reduce the appearance of the wall surface. Walls would have low-sheen and non-reflective surface materials to reduce potential for glare. The use of smooth troweled surfaces and glossy paint would be avoided. In addition, white or light colored surfaces would be avoided for | **Crystal Springs Hatchery**<br>Refer to Alternative 1 mitigation measure, *Reduce Glare from Buildings and Apply Minimum Lighting Standards,* described for the Crystal Spring hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is recommended for operations at the Yankee Fork and Panther Creek sites under Alternatives 2. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | the Crystal Springs hatchery and Yankee Fork weir facility because the use of earth-toned colors that complement the surrounding landscape would help to reduce the effects of glare. The Yankee Fork weir facility would consider using colors that complement or match nearby historic structures, such as browns or dark tans. The exception to using white colors would be at the Panther Creek weir facility, where the use of white walls and green roofing would enable the facility to better blend with existing USFS buildings that are adjacent to the site. However, coloring the sides of the acclimation holding ponds a shade that is two to three shades darker than the general surrounding area such as a dark evergreen, black, or dark brown color would help these round structures to recede into the visual landscape, rather than stand out amongst the square and rectangular buildings. In addition, the pumping station, degas tower, and aboveground piping would be colored to match the acclimation holding ponds. Appropriate paint types would be selected for the finished material to ensure environmental safety and long-term durability of the painted surfaces. The appropriate operating agency or organization would maintain the paint color over time.<br>All artificial outdoor lighting is to be limited to safety and security requirements and would be designed using Illuminating Engineering Society's design guidelines and in compliance with International Dark-Sky Association approved fixtures. All lighting is to provide minimum impact on the surrounding environment and would utilize downcast, cut-off type fixtures that are shielded and direct the light only towards objects requiring illumination. Therefore, lights would be installed at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky. The lowest allowable wattage would be used for all lighted areas and the number of nighttime lights needed to light an area would be minimized to the highest degree possible. Light fixtures would have non-glare finishes that would not cause reflective daytime glare. Lighting would be designed for energy efficiency, use | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | high-pressure sodium vapor lights with individual photocells, and have daylight sensors or be timed with an on/off program. Lights would provide good color rendering with natural light qualities with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, would be designed to be aesthetically pleasing.<br>Lights along pathways and safety lighting at building entrances and loading areas would employ shielding to minimize off-site light spill and glare and be screened and directed away from employee housing and adjacent uses to the highest degree possible. The amount of nighttime lights used along pathways and in parking areas would be minimized to the highest degree possible to ensure that spaces are not unnecessarily over-lit. For example, the amount of light can be reduced by limiting light posts to higher use areas and by using hooded wall mounts or bollard lighting on travel way portions of pathways.<br>Technologies to reduce light pollution evolve over time and design measures that are presently available may help, but may not be the most effective means of controlling light pollution once the hatchery is designed. Therefore, all design measures used to reduce light pollution would employ the technologies available at the time of hatchery design to allow for the highest potential reduction in light pollution, which would result in low impacts from glare caused by the new facilities.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Refer to Alternative 1 mitigation measure, *Reduce Glare from Buildings and Apply Minimum Lighting Standards,* described for the Crystal Spring hatchery.<br>*Reduce Visibility of the Security Fencing.* The following mitigation measures would reduce visibility of the security fencing associated with the proposed Yankee Fork and Panther Creek weir facilities:<br>● New fencing associated with the proposed weir facilities would be designed in a manner that allows these features to blend with the surrounding built and natural environments so that the new features complement the visual landscape. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ● Any proposed fencing would be powder-coated and colored a shade that is two to three shades darker than the general surrounding area, such as a dark evergreen, black, or dark brown color. These darker colors would allow fencing to recede into the visual landscape as much as possible and allow for more transparent views through the fencing. Light or bright colors would be avoided because such colors, including the grey stainless steel associated with standard chain link fencing, creates more of a visual barrier that pulls visual focus, is less transparent, and increases glare. Appropriate paint types would be selected for the finished material to ensure environmental safety and long-term durability of the painted surfaces. The appropriate operating agency or organization would maintain the paint color over time. Fencing would be managed and maintained for a well-kept appearance.<br>● Vandalism, graffiti, or damage would be abated semi-annually to maintain the effectiveness and attractiveness of the visual mitigation prescribed herein.<br>● Interpretive signage would be posted explaining the purpose and function of the facilities. | |
| Section 3.13, Noise | | |
| Construction | **Crystal Springs Hatchery, Yankee Fork and Panther Creek Weir Facilities**<br>The Tribes would implement the following best management practices to minimize noise levels associated with construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:<br>● Schedule construction work during daylight hours between 7:00 a.m. and 9:00 p.m.<br>● Locate stationary construction equipment as far away from noise-sensitive receptors as possible.<br>● Require sound-control devices that are at least as effective as those originally provided by the manufacturer on all construction equipment powered by gasoline or diesel engines. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand. No mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ● Select pumps and backup generators that do not generate excessively high noise levels. | |
| Operations | No mitigation is recommended for operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites. | No mitigation is recommended for operations at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site. |
| Section 3.14, Public Health and Safety | | |
| Construction | **Crystal Springs Hatchery, Yankee Fork and Panther Creek Weir Facilities**<br>To minimize safety risks on workers and the public during construction of the Crystal Springs hatchery and Yankee Fork and Panther Creek permanent weir facilities, the construction contractor would implement the following BMPs:<br>● Select appropriately qualified construction workers.<br>● Hold safety meetings with construction workers at the start of each work week to review potential safety issues and concerns.<br>● Ensure that construction workers comply with federal and state safety standards<br>● Attend monthly meetings with BPA and Tribal staff to discuss safety issues.<br>● Restrict public access to active construction areas; exclude all unauthorized personnel from entry.<br>Construction activities at the Crystal Springs hatchery site would also require the use of diesel fuel, paints and solvents, and cement and asphalt. To avoid, minimize, or offset the risk of accidental spills, and ensure that any risk to public health and safety would be minimal, the construction contractor would implement the following measures:<br>● Obtain a NPDES permit for construction activities prior to any ground-disturbing activities (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*).<br>● Implement a stormwater pollution prevention plan (SWPPP), which includes implementing a SPCC plan; both the SWPPP and the SPCC plan are required under the NPDES Permit.<br>● Prepare a Safety Plan in compliance with state requirements | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand. No mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | before starting construction. Specify how to manage hazardous materials, such as fuel and any hazardous 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 it as needed. | |
| Operations | **Crystal Springs Hatchery**<br>To minimize safety risks on Crystal Springs hatchery workers, the Tribes would implement the following BMPs:<br>● Hire appropriately qualified hatchery workers.<br>● Train staff in the proper use, transport, handling, and storage of all chemicals to minimize dangers of overexposure or accidental release to the environment.<br>● Ensure that hatchery workers comply with state and federal safety standards.<br>● Provide appropriate safety equipment.<br>● Store chemicals in areas designed to contain chemicals in the event of a leak or accidental spill.<br>During normal hatchery operations, chemicals and hazardous materials would be stored at the Crystal Springs hatchery in accordance with applicable state and federal regulations, and as described in Chapter 9, *Chemical Handling Protocols*, from the draft *Crystal Springs Hatchery Fish Culture Procedures Manual*. Implementing the measures listed below—which include proper labeling, storage in a separate chemical storage area, security, and proper training of staff for safety, handling, and spill cleanup response—would reduce the risk of accidental spills, resulting in minimal potential impact on public health and safety.<br>***Labeling***<br>● Label all containers. Include chemical name, formula, expiration date, storage requirements, and primary hazards.<br>● Ensure labels are colorfast and permanent.<br>● Replace labels if they become damaged or faded.<br>***Storage***<br>● Keep containers closed with threaded caps when not in use. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the same mitigation recommended under Alternative 1 for the Yankee Fork and Panther Creek weir facilities. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | • Segregate incompatible chemicals by storing acids, bases, and flammable liquids in separate cabinets, and separating oxidizers, pure metals, and reactives from other compounds on shelves.<br>• Consult chemical supplier for suggested systems for chemical storage.<br>• Store chemicals so that labels are visible.<br>• Ensure chemicals are stored in appropriate storage cabinets.<br>• Store flammable liquids in certified flammable storage cabinets and acids in corrosion-resistant nonmetal cabinets.<br>• Store volatile chemicals requiring refrigeration in explosion-proof refrigerators. A spark from the thermostat or light switch in a traditional unit could be enough to set off volatile fumes from the chemical and cause an explosion.<br>• Store chemicals at or below eye level (but not on the floor).<br>• Never stack chemicals top of each other.<br>• Stock small quantities of chemicals. Small bottles are less likely to break than large ones.<br>• Monitor the integrity of shelves. For example, are the chemicals too heavy for the shelf? Is the shelf sagging? Do the shelves show signs of wear? Are support clips corroded?<br>• Use secondary containment for liquids in storage to contain spills. Ensure the materials in a secondary container are compatible with each other and with the containment tub.<br>• Anchor storage cabinets to walls and doors so that earthquakes or other hazards do not topple cabinets.<br>• Monitor chemical containers to ensure container integrity remains intact. Signs of wear may include bulging, cracks, leaks, or rust.<br>• Monitor container tops for cracks, especially on bottles of nitric acid. Replace if degraded.<br>***Chemical Storage Area***<br>• Acid fumes can eat away at metals. Note corrosion residue below metal shelf holders.<br>• Label all containers. Include chemical name, formula, | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | expiration date, storage requirements, and primary hazards.<br>● Monitor caps and replace when worn to prevent evaporation, leaks, and spills.<br>● Monitor volumes of chemicals. If chemical reductions are noted, this could be a sign of evaporation or theft.<br>● Monitor the stored chemicals for crystal buildup or formation of a liquid above a solid. These could indicate a leaking cap or the formation of potentially unstable and dangerous by-products.<br>● If hazardous potential is unknown, contact a local hazardous waste management company (i.e., look in the phone book under *Environmental Services*) or the State Communications Center, at (800) 632-8000, for assistance.<br>● Monitor expiration dates on chemicals. Use chemicals on a first-in, first-out basis to prevent accumulation of expired materials.<br>***Security***<br>● Lock chemical cabinets or storage rooms to prevent theft.<br>● Restrict student access to chemical cabinets and storage rooms.<br>● Monitor chemical volumes. Unanticipated reductions in volume could be a sign of theft.<br>● Conduct routine inventories of chemicals and monitor wastes.<br>● Provide copies of updated chemical inventories to school management and the local fire station.<br>***Other***<br>● Ensure that staff is trained in the hazards of chemicals, spill cleanup response, and safety procedures.<br>● Have Material Safety Data Sheets on site for all chemicals.<br>● Purge unneeded, older chemicals yearly to prevent chemical stockpiles.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Several safety risks are associated with the trapping of fish at the Yankee Fork and Panther Creek permanent weir facilities. To | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ensure worker safety, the Tribes would implement the following risk minimization strategies associated with trapping fish:<br>● Upon being hired, Tribal staff would attend a swift-water rescue course through Idaho State University to become aware of common self-rescue and assisted rescue techniques.<br>● Tribal staff would be equipped with dry suits when performing instream tasks. Personal flotation devices are not needed because the water levels in Yankee Fork and Panther Creek are relatively low; the primary concern is cold water exposure.<br>● During normal operation of the Yankee Fork and Panther Creek weir facilities, potential hazardous chemicals such as formalin would be stored according to state and federal regulations as described above. Additional measures to minimize spills and exposure to hazardous chemicals would be similar to those described above for the Crystal Springs hatchery. These measures would ensure potentially hazardous materials are properly stored and used in a manner that reduces the risk of accidental spills and exposure. These measures also require a plan for a timely cleanup response should an accidental spill occur. | |

# Chapter 1
# Purpose of and Need for Action

## 1.1 Introduction

Bonneville Power Administration (BPA) is proposing to fund construction and operation of the Shoshone-Bannock Tribes' (Tribes') Crystal Springs Hatchery Program (Hatchery Program) in Idaho (Proposed Action). Operation of the Hatchery Program would involve producing Snake River spring/summer-run Chinook salmon (Chinook salmon) for release into two locations in the Salmon River basin and Yellowstone cutthroat trout for release into a lake on the Tribes' reservation.

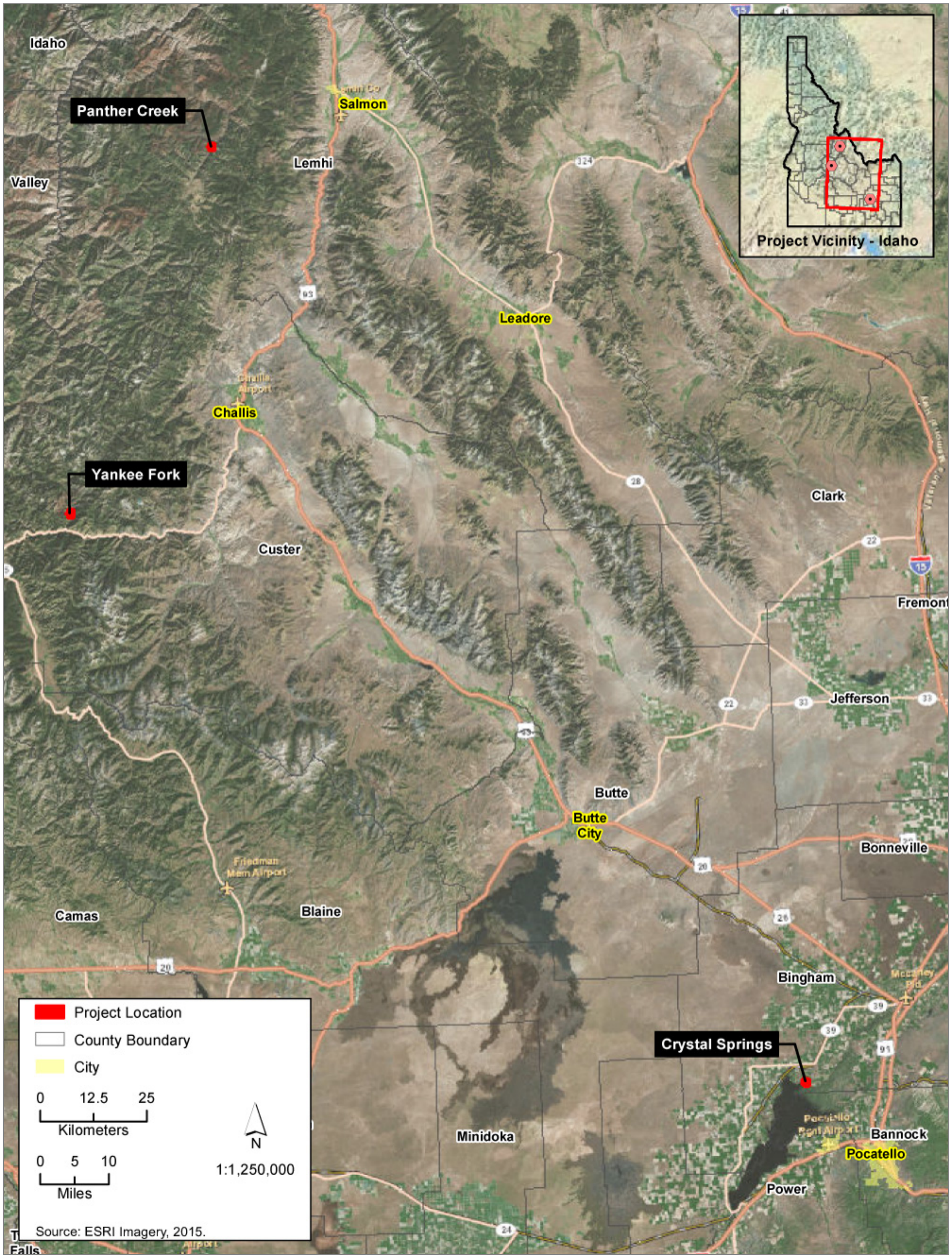
The Hatchery Program includes the Crystal Springs hatchery, which would be constructed at an obsolete trout hatchery in Bingham County, and two fish trapping (weir) facilities, which would be developed within the Salmon-Challis National Forest—one on the Yankee Fork of the Salmon River (Yankee Fork) (Custer County) and one on Panther Creek (Lemhi County) (Figure 1-1). If the hatchery and genetic management plans (HGMPs)[1] prepared to operate the Hatchery Program meet Endangered Species Act (ESA) criteria, the Hatchery Program would be permitted to produce up to one million Chinook salmon smolts and 5,000 Yellowstone cutthroat trout to provide harvest opportunities for Tribal and non-Tribal fishers in the basin. The Hatchery Program would also meet the cultural objectives of providing Tribal members with opportunities to harvest Chinook salmon using traditional and contemporary methods and observe Chinook salmon spawning naturally as a result of increased abundance of adults on the spawning grounds. Snake River spring/summer-run Chinook salmon are listed as threatened under ESA (70 FR 37160). Yellowstone cutthroat trout are not ESA-listed but are considered a species of concern by the U.S. Fish and Wildlife Service.

This Environmental Impact Statement (EIS) 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 that their actions may have on the environment. Major federal actions significantly affecting the quality of the human environment must be evaluated in an EIS. The U.S. Forest Service (USFS), National Marine Fisheries Service (NMFS), and Tribes are cooperating agencies for the development of this EIS, and their roles are described in Section 1.6, *Roles of the Cooperating Agencies*.

This chapter of the EIS describes the need for action from the perspectives of BPA, USFS, and NMFS; the purposes that BPA and the three cooperating agencies seek to achieve in addressing that need; background information related to the Proposed Action; the history of the spring/summer-run Chinook salmon and Yellowstone cutthroat trout hatchery programs in the Salmon River basin; the roles of the cooperating agencies; the decisions to be made by the cooperating agencies involved in the development of this EIS; and the public involvement and scoping process and scoping comments received.

[1] A Hatchery and Genetic Management Plan (HGMP) is a document developed by a fish management agency (such as a tribe) that describes in detail the operation of a hatchery. The information provided in the HGMP is reviewed by the National Marine Fisheries Service (NMFS) and used to determine the level of effect hatchery operations may have on listed species in the area, and ultimately allow NMFS to permit or authorize the hatchery under the federal Endangered Species Act.

**Figure 1-1. Locations of Proposed Crystal Springs Hatchery Program Facilities**



# 1.2 Need for Action

The need statements of BPA, USFS, and NMFS for the Proposed Action are described in this section.[2]

## 1.2.1 Bonneville Power Administration

BPA needs to respond to the Tribes' request to fund their proposal to construct and operate a hatchery to raise Chinook salmon. Chinook salmon would be released in the Salmon River basin and Yellowstone cutthroat trout would be released into an oxbow lake in Fort Hall Bottoms within the Tribes' Fort Hall Reservation in southern Idaho. BPA is also responding to the Tribes' request to fund the development of weir facilities at the Pole Flat Campground along Yankee Fork and at the Cobalt Ranger District administrative site along Panther Creek.

## 1.2.2 U.S. Forest Service

The USFS Salmon-Challis National Forest needs to respond to the Tribes' application for special use permits authorizing activities on national forest lands to construct and operate the Tribes' weir and fish acclimation facilities on the Yankee Fork and Panther Creek.

## 1.2.3 National Marine Fisheries Service

As described in Section 1.4.6, *Administering the Endangered Species Act*, the Tribes' HGMPs will undergo ESA review and approval by NMFS prior to implementing the Hatchery Program. Under the future proposed ESA action contemplated by NMFS, NMFS would evaluate effects of implementing the HGMPs on ESA-listed Chinook salmon and steelhead in an ESA Section 7 consultation. NMFS's need for the Proposed Action would be to ensure that hatchery production of Snake River spring/summer-run Chinook salmon comply with requirements of the ESA and would be consistent with efforts to support naturally spawning populations of Chinook salmon in the Salmon River basin.

# 1.3 Purposes for Action

Purpose statements from BPA, the Tribes, USFS, and NMFS for the Proposed Action are described in this section.

## 1.3.1 Bonneville Power Administration

In meeting the need for the Proposed Action, the alternatives considered should achieve the purposes listed below. BPA will base its choice among alternatives on how well each alternative meets these purposes.

- Support efforts to mitigate for effects of the development and operation of the Federal Columbia River Power System (FCRPS) on fish and wildlife in the Columbia River and its tributaries, including the Snake River, under the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 *et seq.*).

[2] While the Tribes are considered a cooperating agency on the development of this EIS, they are not a federal agency and, therefore, do not have a NEPA decision to make as part of this process. Therefore, the Tribes do not have a need for action.

- Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement between BPA and the Tribes (Shoshone-Bannock Tribes et al. 2008).
- Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction, which calls for protecting weak stocks—like the Snake River spring/summer-run Chinook salmon—while sustaining overall populations of fish for their economic and cultural value (BPA 2003).
- Minimize harm to natural and human resources, including species listed under the ESA.

### 1.3.2 Shoshone-Bannock Tribes

The Tribes has identified the following purposes for the Proposed Action (Shoshone-Bannock Tribes 2013a).

- The primary purpose for the Hatchery Program is to increase terminal harvest opportunities for Tribal members in the Yankee Fork and Panther Creek, with a minimum of 1,000 adult Chinook salmon in Yankee Fork, and a minimum of 800 adult Chinook salmon in Panther Creek.
- The Hatchery Program would also ensure Tribal members have the opportunity to harvest Chinook salmon using both traditional hunting methods (i.e., spearing) and contemporary methods (i.e., weirs, hook-and-line, or nets). In addition, the Hatchery Program would contribute to the Tribal goal of providing opportunities to see Chinook salmon spawn naturally by increasing the abundance of adults on the spawning grounds.
- The Hatchery Program would produce the fish required to achieve the Hatchery Program's defined purpose (i.e., harvest) on a long-term sustainable basis.
- The use of appropriate broodstock would reduce risks (e.g., from straying) to other populations associated with the evolutionary significant unit (ESU) and increase natural-origin Chinook salmon abundance in two additional streams (i.e., Yankee Fork and Panther Creek). Carcasses from natural spawning adults will also provide nutrients for other native species, thereby improving the health and abundance of these species over time.

### 1.3.3 U.S. Forest Service

USFS has identified the following purpose to meet its need for the Proposed Action.

- Ensure any special use permit issued is consistent with the Salmon-Challis National Forest plans.

### 1.3.4 National Marine Fisheries Service

NMFS has identified the following purposes to meet its need for the Proposed Action.

- Ensure the Proposed Action does not jeopardize the continued existence of ESA-listed Chinook salmon or steelhead or result in destruction or adverse modification of designated critical habitat.
- Ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon by conserving its productivity, abundance, diversity, and distribution.

# 1.4 Background Information

The following sections provide background information in support of the Proposed Action.

## 1.4.1 Northwest Power Act/Council's Fish and Wildlife Program

The Northwest Power Act directs BPA to protect, mitigate, and enhance fish and wildlife affected by the development and operation of federal hydroelectric facilities on the Columbia River and its tributaries. To assist in accomplishing this, the Northwest Power and Conservation Council (Council) makes recommendations to BPA concerning which fish and wildlife projects to fund. The Council gives deference to project proposals developed by state and Tribal fishery managers. The Tribes' proposal is one of the projects recommended to BPA by the Council (Fritsch 2012).

As part of its Fish and Wildlife Program, the Council has a three-step process for review of artificial propagation projects (i.e., hatcheries) proposed for BPA funding (NPCC 2006). Step 1 is conceptual planning, represented primarily by master plan development and approval. The master plan provides the scientific rationale for the activities proposed as part of a fish production program, and presents initial designs for proposed new facilities. Step 2 provides preliminary designs and cost estimates and environmental review. Step 3 is the final design review. The Council's Independent Scientific Review Panel (ISRP) reviews the proposed projects as they move from one stage of the process to the next.

The Council and the ISRP reviewed two drafts of the *Crystal Springs Fish Hatchery and Programs for Snake River Chinook Salmon and Yellowstone Cutthroat Trout Master Plan* (Crystal Springs Master Plan [Shoshone-Bannock Tribes 2011]), providing feedback and recommendations to the Tribes on scientific goals and methods. On August 7, 2012, the Council and the ISRP determined the proposed Crystal Springs Master Plan sufficiently met scientific review criteria to recommend that BPA and the Tribes move to Step 2 of the Council's process. In addition to meeting NEPA obligations for BPA, USFS, and NMFS, this EIS addresses the environmental review requirements of Step 2.

The Crystal Springs Master Plan is incorporated by reference in this EIS (Shoshone-Bannock Tribes 2011).[3] It includes biological data, ecological rationale, and environmental and engineering research to support much of the analysis in the EIS.

## 1.4.2 2008 Columbia Basin Fish Accords

On November 6, 2008, BPA, U.S. Bureau of Reclamation (Reclamation), and U.S. Army Corps of Engineers (Corps), signed an agreement with the Tribes to work as partners to provide tangible survival benefits for salmon recovery. The 2008 Columbia Basin Fish Accords Memorandum of Agreement between the Tribes and FCRPS Action Agencies includes an agreement to fund the proposed Hatchery Program, contingent on a favorable recommendation from the Council, site-specific NEPA, and other environmental compliance review (Shoshone-Bannock Tribes, et al. 2008).

[3] The Crystal Springs Master Plan may be found at https://www.bpa.gov/efw/Analysis/NEPADocuments/Pages/Crystal-Springs.aspx

### 1.4.3 Tribal Treaty Fishing and Management Rights under *U.S. v. Oregon*

The relationship between the federal government and the Tribes of the Fort Hall Reservation is governed by a treaty, statutes, regulations, executive orders, and judicial decisions. In the Fort Bridger Treaty of July 3, 1868, between the Tribes and the United States, the Tribes reserved the right to hunt on the unoccupied lands of the United States (Article 4), and the Treaty has been interpreted to include the right to fish. The Treaty recognized the central role salmon played in the culture, religion, health, and economic well-being of Tribal members. The Tribes' Treaty interest in fish management has been acknowledged by the federal district court in *United States v. Oregon*, which resulted in a fisheries management agreement for 2008–2017 between the parties to the lawsuit including the Tribes (2008–2017 *United States v. Oregon Management Agreement*).

### 1.4.4 Hatchery Reform

The Hatchery Scientific Review Group (HSRG), a 14-member independent scientific review panel, was charged by Congress with reviewing all state, Tribal, and federal hatchery programs in the Columbia River Basin as part of a comprehensive hatchery reform effort to:

- conserve indigenous salmonid genetic resources,
- assist with the recovery of naturally spawning salmonid populations,
- provide sustainable fisheries, and
- improve the quality of hatchery programs.

In February 2009, the HSRG published its final system-wide report. The report recommended that hatchery programs rely on comprehensive monitoring and evaluation to determine how management changes can address factors influencing fisheries. The principles underlying hatchery reform for an integrated conservation approach directed the operation and management of hatchery facilities to achieve proper genetic integration with natural-origin fish. Reform principles also stated that efforts should be made to minimize the potential for adverse interactions between hatchery and natural-origin fish, while maximizing survival of hatchery fish. Finally, reform principles promoted the local adaptation of natural and hatchery populations. Consistent with the principles of hatchery reform, hatchery programs should include adaptive management to evaluate whether and to what degree they result in a sustainable fishery, and, if needed, address subsequent actions to fully meet conservation and population goals.

### 1.4.5 Special Designations

The Yankee Fork and Panther Creek project areas are located within the Salmon-Challis National Forest, managed by the USFS, along river segments that have been determined by the USFS to be eligible for designation as Wild and Scenic Rivers under the Wild and Scenic Rivers Act. While these river segments have been determined to be eligible (meeting specific criteria and suitable for designation), they have not been designated. Designation is made by an act of Congress or a state's application to the Secretary of the Interior. Upon designation, the eligible river attains Wild and Scenic River status and the protection that law affords. Eligible rivers are not protected by the Wild and Scenic Rivers Act, but USFS policy is that a river found to be eligible must be protected as far as possible to the same extent as a congressionally designated river (USFS 1989).

Yankee Fork was determined to be eligible under the "Recreation" classification for Wild and Scenic Rivers status in 1989 (USFS 1989). Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad, and that may have some development along their shorelines or may have undergone some impoundment or diversion in the past (National Wild and Scenic Rivers System 2016). There are two eligible segments of the Yankee Fork relevant to this analysis—Segment A is the lower reach heading upstream from the mouth for 2 miles; Segment B is immediately upstream of the first and stretches for 6 miles. The Yankee Fork project area is located within Segment A, very near its boundary with Segment B. The USFS determined this segment contains the following Outstandingly Remarkable Values (ORVs): free-flowing, recreation, geology, and historic components.

Panther Creek was also determined to be eligible under the "Recreation" classification. The entire Panther Creek drainage (beginning at the mouth and extending 45 miles upstream) is considered eligible. The USFS determined that Panther Creek contains the following ORVs: free-flowing, scenery, recreation, geology, fish, and wildlife.

USFS's policy is that forest plan land management prescriptions for river corridors identified in the National River Inventory protect the river's free flowing characteristics and its ORVs; and that management and development of the identified river and its corridor not be modified to the degree that eligibility or classification would be affected (USFS 1992). This policy of protection is to be continued until a decision is made as to the future use of the river and adjacent lands (USFS 1992).

### 1.4.6 Administering the Endangered Species Act

In addition to Northwest Power Act obligations, BPA as a federal agency also must comply with the ESA (16 USC 1531 *et seq.*). A federal agency has the responsibility to ensure that any action it funds, authorizes, or carries out does not jeopardize the continued existence of ESA-listed species or result in the destruction or adverse modification of designated critical habitat. As part of this responsibility, the federal agency must consult with the Secretary of the Interior or the Secretary of Commerce (depending on the species) on any action that may adversely affect a species listed under the ESA (50 Code of Federal Regulations (CFR) 42). In this case, NMFS is the agency responsible for consulting on behalf of the Secretary of Commerce for the actions funded by BPA affecting ESA-listed salmon and steelhead.

NMFS is the agency responsible for administering the ESA as it relates to ESA-listed salmon and steelhead. Actions that may affect ESA-listed species are reviewed by NMFS under various sections of the ESA as described below. Authorizations for actions that directly take listed salmon and steelhead for artificial propagation of an ESA-listed species may be authorized under Section 10 or Section 4(d) of the ESA. In addition to authorizing the actions, NMFS may apply conditions to the approval to minimize impacts on ESA-listed salmon and steelhead. Regardless of the authorization pathway, NMFS would also analyze effects of the Hatchery Program in an ESA Section 7 consultation to determine if the action would jeopardize the continued existence of ESA-listed species or result in destruction or adverse modification of designated critical habitat.

As part of the ESA consultation, NMFS may apply any conditions deemed necessary to minimize or avoid the effects of implementing the action. The purpose of the consultation process (through ESA Section 4, Section 7, and Section 10) is to limit the application of take prohibitions described in Section 9. Each of these authorization pathways requires specific steps, which may differ slightly, and will be described in detail in the ESA documents as they are developed by NMFS.

ESA compliance would be required for the Tribes to use ESA-listed Chinook salmon for production at the proposed hatchery. This compliance would involve analyzing impacts of production on ESA-listed salmon and steelhead. Should the Hatchery Program receive funding, the Tribes would submit a request for authorization to NMFS in the form of HGMPs that describe the Tribes' hatchery production and expected effects of implementing the Hatchery Program.

HGMPs are specific to the ESA; they are the plans that describe hatchery programs. HGMPs are written to describe a proposed production plan, and include a description of the fish species propagated, the hatchery facilities used, the life stage when the fish are released, the location of fish releases, and environmental effects of the activities included in the proposed production plan. Often, several separate hatchery programs may be associated with each primary hatchery facility, since they often supply rearing space for programs with different purposes. Most HGMPs describe a single program, which is typically related to the program goals rather than to the facility. As a result, a single hatchery facility may have more than one HGMP that describes the activities that occur at that facility. In this case, the Crystal Springs Hatchery facility would produce three species: (1) Yankee Fork spring/summer-run Chinook salmon, (2) Panther Creek spring/summer-run Chinook salmon, and (3) Yellowstone cutthroat trout. Because proposed activities at Yankee Fork and Panther Creek may affect ESA-listed Snake River spring/summer–run Chinook salmon and Snake River basin steelhead, each of these programs would be supported by a separate HGMP to describe the species propagated, location of broodstock collection, location of juvenile releases, logistics of operation, and program goals and monitoring specific to each program. Because Yellowstone cutthroat trout would be collected and released outside of the range of ESA-listed salmon and steelhead, an HGMP may not be needed for a detailed ESA review and approval (i.e., two HGMPs would be submitted to NMFS for ESA review).

# 1.5 Crystal Springs Hatchery Program History

The Tribes developed the Hatchery Program to provide harvest opportunities and meet cultural goals for two native fish species of cultural and economic significance to the Tribes: spring/summer-run Chinook salmon and Yellowstone cutthroat trout. Restoration would occur in geographically distinct areas across three watersheds in Idaho. Chinook salmon produced at Crystal Springs hatchery would be acclimated and released in the Yankee Fork basin and the Panther Creek basin, both tributaries to the upper Salmon River. Yellowstone cutthroat trout produced at the Crystal Springs hatchery would be released in an oxbow lake within the Tribes' Fort Hall Reservation. The following sections describe Chinook salmon activities in the Yankee Fork and Panther Creek basin, as well as the Yellowstone cutthroat trout program administered by the Tribes.

## 1.5.1 Chinook Salmon Activities in the Yankee Fork and Panther Creek Basins

In 2008, the Tribes implemented the Yankee Fork Chinook Salmon Supplementation Project (YFCSS) in response to the declining Chinook salmon population in Yankee Fork to increase the number of adults returning to that system. The decision to supplement Yankee Fork Chinook salmon resulted from a number of factors, including those factors listed below.

1. An immediate need to prevent local extirpation.
2. The importance of the area as a Tribal subsistence fishery and the need to achieve the Tribal harvest objective of 1,000 adults.
3. The importance of recovering this population and achieving the conservation objective of 500 spawners annually.
4. The long history of introductions of out-of-basin stocks.
5. The proximity of a donor hatchery (Sawtooth Hatchery) that could provide broodstock to support a supplementation effort.
6. Regional support for the YFCSS project.

The proposed Hatchery Program would be consistent with the Tribes' existing YFCSS project in the Yankee Fork (Tardy 2010) by providing a consistent source of locally adapted spring/summer-run Chinook salmon broodstock and juveniles, and would ultimately:

- contribute to recovery of the Snake River spring/summer-run Chinook salmon ESU by restoring a locally maintained population of local spring/summer-run Chinook salmon in Yankee Fork;
- achieve a Tribal harvest of about 1,000 spring/summer-run Chinook salmon in Yankee Fork; and
- ensure the Tribal harvest in Yankee Fork can be achieved by traditional hunting or contemporary methods.

The Tribes' Fish and Wildlife Department has been actively trapping adult Chinook salmon for the YFCSS in the Yankee Fork since 2008, using temporary weir facilities under a temporary special use permit granted by the USFS. The YFCSS has also included release of eyed eggs, fry, smolts, and adult Chinook salmon using broodstock from the Idaho Department of Fish and Game Sawtooth Hatchery located near Stanley, Idaho.

Production of Chinook salmon is designed to increase the abundance of Chinook salmon in both the Yankee Fork and Panther Creek. Increasing abundance in both watersheds would provide opportunities for harvest of hatchery fish and lead to restoration of locally adapted hatchery stocks. The proposed Hatchery Program controls the natural spawning population in the Yankee Fork and Panther Creek by managing adult returns at the trapping facilities in an effort to eventually contribute to recovery goals in both systems. Contributing to Chinook salmon recovery efforts continues to be an important long-term objective of the Tribes' management strategies. Species recovery efforts have been largely directed at other systems in the upper Salmon River; therefore, Yankee Fork and Panther Creek are suitable locations to establish populations that can support treaty-reserved Tribal harvest and public harvest, while also contributing to species conservation goals (Shoshone-Bannock Tribes 2013a). In addition to meeting HSRG and Tribal cultural and harvest objectives, Chinook salmon broodstock for the Hatchery Program would be obtained from within the major population group, accelerating the process of local adaptation and ultimately contributing to recovery of Chinook salmon in the long term.

The successful restoration of Chinook salmon will depend on the Tribes' proposed Hatchery Program as well as implementation of habitat improvements. Substantial water quality improvement measures have been completed at some former mine sites in the Yankee Fork, and the Tribes is engaged in restoration activities in the Yankee Fork to address habitat-limiting factors. Collaboration is also ongoing with the Trustees of the Blackbird Mine Settlement Agreement (Blackbird Mine Site Consent Decree, 1995, Consolidated Case No. 83-4179(R), U.S. District Court-District of Idaho) to help meet population and habitat restoration goals in Panther Creek. BPA and the Tribes have met with the Trustees to discuss the proposed Hatchery Program, and how it might help meet the population and habitat restoration goals of the Settlement Agreement. When fully implemented, these complementary efforts would restore conditions that could sustain healthy populations of fish and wildlife to these watersheds. Habitat restoration work has already been completed under the 2008 Fish Accord in both watersheds that includes development of side channel habitat along the Yankee Fork, and installation of a series of livestock exclosure fences along the upper main channel of Panther Creek.

### 1.5.2 Yellowstone Cutthroat Trout

Yellowstone cutthroat trout is a culturally important species to the Tribes, and much of the focus of its program since the early 1990s has been on trout habitat restoration and enhancement activities. These efforts have included the removal of non-native species, planting "pure" (not hybridized with rainbow trout) Yellowstone cutthroat trout into suitable, underutilized or under-occupied habitat, and habitat improvements such as streamside stabilization, modification to grazing practices, and livestock fencing along the spring-fed streams in the Fort Hall Bottoms area where reintroduction could occur.

Production of Yellowstone cutthroat trout is designed to provide additional Yellowstone cutthroat trout catch and harvest opportunities for both Tribal and sport anglers. Annual hatchery production goals are approximately 5,000 sub-catchable sized (5 to 6 inches) Yellowstone cutthroat trout for release into a spring-fed 16-acre oxbow lake located within the Fort Hall Reservation.

Surveys indicate the oxbow lake is moderately eutrophic and would provide excellent rearing conditions for Yellowstone cutthroat trout. These fish are expected to exhibit fast growth rates and should produce a trophy fishery within one to two years after initial stocking. This lake fishery would complement the existing trophy stream fishery currently in place in the Fort Hall Bottoms.

# 1.6 Roles of the Cooperating Agencies

This EIS was prepared pursuant to regulations implementing 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. BPA is the lead agency responsible for NEPA analysis of the Proposed Action to fund construction and operation of the Tribes' Hatchery Program. Additionally, three cooperating agencies—the Tribes, USFS, and NMFS—are participating in development of the EIS as allowed under 40 CFR 1501.6. The role for each agency is described below.

- The Tribes is a cooperating agency to support development of the EIS by supplying technical information relevant to the Hatchery Program, other alternatives, and environmental consequences.
- The USFS is a cooperating agency assisting with development of this EIS to support its consideration of the issuance of special use permits for the Yankee Fork and Panther Creek weir facilities proposed on USFS-managed land.
- NMFS is a cooperating agency assisting with the development of the EIS to support its consideration of future ESA compliance for hatchery production. The alternatives and analyses in this EIS contemplate future NEPA review required after the Tribes submit its ESA compliance request in the form of HGMPs to NMFS under ESA Section 10(a)(1)(A) or Section 4(d). As a consequence of its role as a cooperating agency in development of this EIS, NMFS will consider adopting this analysis for its NEPA compliance requirements when analyzing the environmental consequences of the Tribes' implementation of the HGMPs. If needed, NMFS may supplement this EIS analysis based on information in the HGMPs submitted to NMFS, and will prepare its own Record of Decision (ROD).

# 1.7 Decisions to be Made

The following sections describe the decisions to be made by BPA and the three cooperating agencies for the Proposed Action.

## 1.7.1 Bonneville Power Administration

The decision to be made by BPA for this Proposed Action is whether BPA will provide funding to the Tribes for its proposal to construct and operate the Hatchery Program. 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. Based on this analysis, BPA would issue a ROD documenting its decision on whether to provide the requested funding.

### 1.7.2 Shoshone-Bannock Tribes

The Tribes is a cooperating agency because of its special expertise in Salmon River basin fisheries management, and assisted with the preparation of this EIS. The Tribes must decide whether BPA's ROD for the Hatchery Program is consistent with Tribal resource management objectives in the Salmon River basin and other treaty and trust obligations.

### 1.7.3 U.S. Forest Service

As the federal land-managing agency responsible for the property at both the Yankee Fork weir facility and Panther Creek weir facility, the USFS would require the Tribes obtain a special use permit prior to construction and operations of the Yankee Fork and Panther Creek weir facilities. The USFS issuance of a special use permit would be subject to NEPA review. To fulfill its obligations under NEPA, the USFS has agreed to participate as a cooperating agency in the preparation of this EIS. USFS will independently evaluate the analyses and conclusion in this EIS and prepare a ROD documenting its decision on whether to provide the permits.

### 1.7.4 National Marine Fisheries Service

The decision to be made by NMFS would require the evaluation of effects of the construction and operations of the Hatchery Program on ESA-listed species. This would involve evaluating effects to ESA-listed Snake River spring/summer-run Chinook salmon and Snake River basin steelhead as described in Section 1.4.6, *Administering the Endangered Species Act*. The decision to issue Section 10 permits or approval of a Section 4(d) limit would be accompanied by an ESA Section 7 consultation, which would authorize the Tribes to collect, handle, transport, produce, and release ESA-listed spring/summer-run Chinook salmon. To fulfill its obligations under NEPA for potential future authorizations listed above, NMFS has agreed to participate as a cooperating agency in the preparation of this EIS. NMFS will independently evaluate the analyses and conclusion in this EIS and prepare a ROD documenting its decision on whether to provide the permits.

## 1.8 Public Involvement and Scoping

BPA, the Tribes, and USFS conducted a series of public meetings in the area to provide project-related information and to solicit public input regarding the issues and alternatives to be addressed in the EIS being prepared for the Hatchery Program. NMFS was not yet involved in the project at the time these meetings were held, and therefore did not participate. The meetings were held at the following locations and dates:

- Fort Hall Reservation, Idaho – June 10, 2014
- Salmon, Idaho – June 11, 2014
- Challis, Idaho – June 12, 2014

These meetings included presentations by Tribal and BPA staff, open question-and-answer sessions, and opportunities for the public to provide comments on the proposed Hatchery Program. Twenty-eight people attended the public meetings and 11 people submitted written comments either through the project website or by mail.

A complete listing of the comments and questions presented at these public meetings and received in letters is included in Appendix A. Where relevant, these comments and questions have been reflected in the text of this EIS. The issues raised during public scoping, as well as where these issues are addressed in this EIS, are presented in Table 1-1.

**Table 1-1. Issues Raised during Public Scoping and Where These Issues are Addressed in the EIS**

| Topic | Issues | Where Addressed in the EIS |
|---|---|---|
| Purpose and Need | The new hatchery should be managed for conservation, as well as for harvest | Section 1.5.2, *Chinook Salmon Activities in the Yankee Fork and Panther Creek Basins* |
| Description of Action | Numbers of fish raised | Section 2.1, *Hatchery Program with Permanent Weir Facilities*<br>Section 2.1.3.1, *Crystal Springs Hatchery* |
| | Source of funding for construction | Section 1.1, *Introduction* |
| | Numbers and salaries of hatchery employees | Section 2.1.3.1, *Crystal Springs Hatchery*, describes employees; salaries not stated |
| | Sources of hatchery water and water rights | Section 3.5, *Groundwater and Surface Water Quality and Quantity* |
| | Anticipated fish survival rates | Section 2.1.3.2 *Yankee Fork Chinook Salmon*<br>Section 2.1.3.3, *Panther Creek Chinook Salmon* |
| | Hatchery construction and operation timeframes | Section 2.1.1.6, *Construction*<br>Section 2.1.3.1, *Crystal Springs Hatchery* |
| | Location of new facilities relative to existing facilities | • Section 2.1.1.1, *Hatchery Site*<br>• Section 2.1.2.1, Yankee Fork Weir Facilities<br>• Section 2.1.2.2, Panther Creek Weir Facilities |
| | Timing of fish collection and release | • Section 2.1.3.2, Yankee Fork Chinook Salmon<br>• Section 2.1.3.3, Panther Creek Chinook Salmon<br>• Section 2.1.3.4, Yellowstone Cutthroat Trout Program |
| | Proposed fish marking techniques | • Section 2.1.5.1, *Yankee Fork*<br>• Section 2.1.5.2, *Panther Creek* |
| | Hatchery capacity | • Section 2.1.1.2, Hatchery Elements<br>• Section 2.1.3.1, Crystal Springs Hatchery |
| | Invasive species control plans | • Section 3.4, *Vegetation* |
| | Protocol for release of non-target fish species | • Table 2-5, Description of Yankee Fork Weir Facilities under Alternative 1 and Alternative 2<br>• Section 3.7.2, Environmental Consequences |

| Topic | Issues | Where Addressed in the EIS |
|---|---|---|
| | Details of construction monitoring | • Section 2.1.2, Fish Trapping Weirs |
| | Relations of the Proposed Action to the HSRG recommendations | • Section 1.4.4, Hatchery Reform<br>• Section 2.1.3.2, Yankee Fork Chinook Salmon<br>• Section 2.1.3.3, Panther Creek Chinook Salmon |
| | Hatchery effectiveness criteria | • Section 2.1.3, Program Operations |
| | Disposition of facilities at the end of the Hatchery Program | • Section 2.1, Alternative 1: Hatchery Program with Permanent Weir Facilities<br>• Section 2.2, Alternative 2: Hatchery Program with Temporary Weir Facilities |
| Alternatives | Yellowstone cutthroat trout program that raises 10,000 trout | • Section 1.5.3, Yellowstone Cutthroat Trout<br>• Section 2.1.3.4, Yellowstone Cutthroat Trout Program |
| | Temporary holding facilities associated with the temporary weirs alternative | • Section 2.2.1, Yankee Fork Weir Facilities<br>• Section 2.2.2, Panther Creek Weir Facilities |
| | Relative maintenance requirements of permanent versus temporary facilities | • Section 2.2.3, Similarities and Differences between Alternative 1 and Alternative 2 |
| | Preferred alternative | The preferred alternative will be identified in the Final EIS. |
| Environmental Issues/Concerns | Status of mining releases in the watersheds | Section 3.5, *Groundwater and Surface Water Quality and Quantity* |
| | Effect of mining on anticipated number of fish returning to the system; fish movement timeframes | Section 3.7, *Fish*<br>*Section 3.17, Cumulative Impacts* |
| | Effects on threatened, endangered, Region 4 Forest Service Sensitive species, Salmon-Challis National Forest Management Indicator Species, migratory birds, and other species of concern identified throughout the scoping process | Section 3.8, *Wildlife* |
| | Effects on cultural resource at USFS sites | Section 3.9, *Cultural Resources* |
| | USFS visual resource requirements | Section 3.12, *Visual Quality* |
| | Wild and scenic river status of Panther Creek (and Yankee Fork) | Appendix D, *Wild and Scenic Rivers Analysis* |
| Other Issues, Questions, and Information | Other hatcheries being proposed | Section 3.17, *Cumulative Impacts* |
| | Protect wild fish rather than produce hatchery fish | Section 3.7, *Fish* |

| Topic | Issues | Where Addressed in the EIS |
|---|---|---|
| | Consider both Salmon and Challis forest management plans | Table 2-7, *Comparison of Alternatives by Purpose* |
| | Non-Tribal harvest allowed in Panther Creek | Chapter 2, *Alternatives, Including the Proposed Action*<br>Section 3.1, *Land Use and Recreation* |
| | Contact County commissioners regarding the Hatchery Program | Section 1.8, *Public Involvement and Scoping* |
| | How citizens can support the Hatchery Program | Not discussed; however, the public may submit comments on this Draft EIS, during the 45-day public review and comment period. |
| | Yellowstone cutthroat trout element of the Hatchery Program will not be considered in the USFS action on the overall Hatchery Program | Not discussed; the Yellowstone cutthroat trout element of the Hatchery Program is not associated with USFS land and, therefore, does not require a permit action on behalf of the USFS and will not be a component of USFS's NEPA decision. |
| | USFS does not consider scoping to end by a specified time | Comment acknowledged. Please note the public scoping period for the Proposed Action ended on July 7, 2014. |

In response to public scoping comments, BPA, the USFS, and the Tribes met with Lemhi and Custer County commissioners to present the proposed Hatchery Program and respond to any questions or comments they might have. These meetings occurred on the following dates:

- March 23, 2015: USFS and the Tribes met with the Lemhi County Commissioners to discuss the Panther Creek portion of the proposed Hatchery Program.
- April 13, 2015: BPA, USFS, and the Tribes met with Custer County Commissioners to discuss the Yankee Fork portion of the proposed Hatchery Program.
- July 1, 2015: USFS and the Tribes performed a site visit with the Lemhi County Commissioners to view the current operations at Yankee Fork temporary weir facility.

Following the public scoping period, BPA prepared this Draft EIS, which BPA published and circulated on May 12, 2017, for a 45-day public review and comment. BPA will accept comments on this Draft EIS until June 26. After the comment period on the Draft EIS has ended, BPA will prepare and circulate a Final EIS. The Final EIS will address comments received on the Draft EIS. BPA will also identify the preferred alternative in the Final EIS based on the Draft EIS analysis and comments received from agencies, tribes, and the public. The Final EIS will support BPA's decision on whether to fund the Proposed Action. Upon completing the Final EIS, BPA will prepare and publish a ROD to document BPA's decision to fund the Proposed Action. The ROD will conclude BPA's NEPA process.

# Chapter 2
# Alternatives, Including the Proposed Action

This chapter describes the Proposed Action, including construction and operation of the Crystal Springs hatchery and permanent weir facilities on the Yankee Fork and Panther Creek, tributaries to the Salmon River in Idaho (Alternative 1). This chapter also describes an alternative that includes the hatchery and temporary weir facilities on Yankee Fork and Panther Creek (Alternative 2), as well as the No Action Alternative. Under Alternative 1 and Alternative 2, two production level options at the Crystal Springs hatchery are considered for Chinook salmon: the proposed production level (up to 1 million smolts of Chinook salmon) and a 50% production level of Chinook salmon. Both alternatives would also produce Yellowstone cutthroat trout.

This chapter also presents options considered in the Crystal Springs Master Plan, describes the alternatives considered but eliminated from detailed study, compares the alternatives, summarizes the environmental effects for each alternative, and lists the mitigation measures recommended for Alternative 1 (the Proposed Action) and Alternative 2.

## 2.1 Alternative 1: Hatchery Program with Permanent Weir Facilities

Under Alternative 1 (the Proposed Action), Bonneville Power Administration (BPA) would fund the Shoshone-Bannock Tribes' (Tribes') construction and operation of the Crystal Springs hatchery to produce Snake River spring/summer-run Chinook salmon and Yellowstone cutthroat trout. The Crystal Springs Hatchery Program (Hatchery Program) would be consistent with and has been developed from the Tribes' Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011). The Hatchery Program would include construction of a new hatchery facility at Crystal Springs in Bingham County, Idaho, and two fish trapping weirs in the Salmon-Challis National Forest—one at the U.S. Forest Service (USFS) Cobalt District Ranger Station on Panther Creek (a tributary of the Salmon River in Idaho) and one at Pole Flat Campground in the Yankee Fork (also a tributary to the Salmon River in Idaho) (see Figure 1-1). If the hatchery and genetic management plans (HGMPs) receive Endangered Species Act (ESA) authorization through issuance of Section 10 permits (Section 1.2.3, *National Marine Fisheries Service*), the Hatchery Program would involve the collection of Chinook salmon broodstock at the weirs and production of up to one million Chinook salmon smolts for release in Yankee Fork (up to 600,000) and Panther Creek (up to 400,000) to provide harvest opportunities for Tribal and non-Tribal fishers in the basin, and to restore naturally spawning salmon populations.[1] The funding would also support the production of 5,000 Yellowstone cutthroat trout for planting within the Tribes' reservation in southern Idaho.

Decommissioning of the hatchery and weir facilities proposed under Alternative 1 is not described in this EIS. Decommissioning of the facilities would occur in the distant future (more than 20 years

[1] Note that because natural-origin returns of Chinook salmon to Yankee Fork and Panther Creek are so low (less than 50 fish annually), taking fish out of these low populations for broodstock would not leave enough natural-origin fish for spawning. Consequently, a phased broodstock collection would be implemented under all alternatives (Shoshone-Bannock Tribes 2010a).

from now) and is too speculative to describe accurately. Such an action, if and when it occurs, will be subject to a separate evaluation under NEPA to determine its environmental impacts and appropriate mitigation, if required.

## 2.1.1 Crystal Springs Hatchery

### 2.1.1.1 Hatchery Site

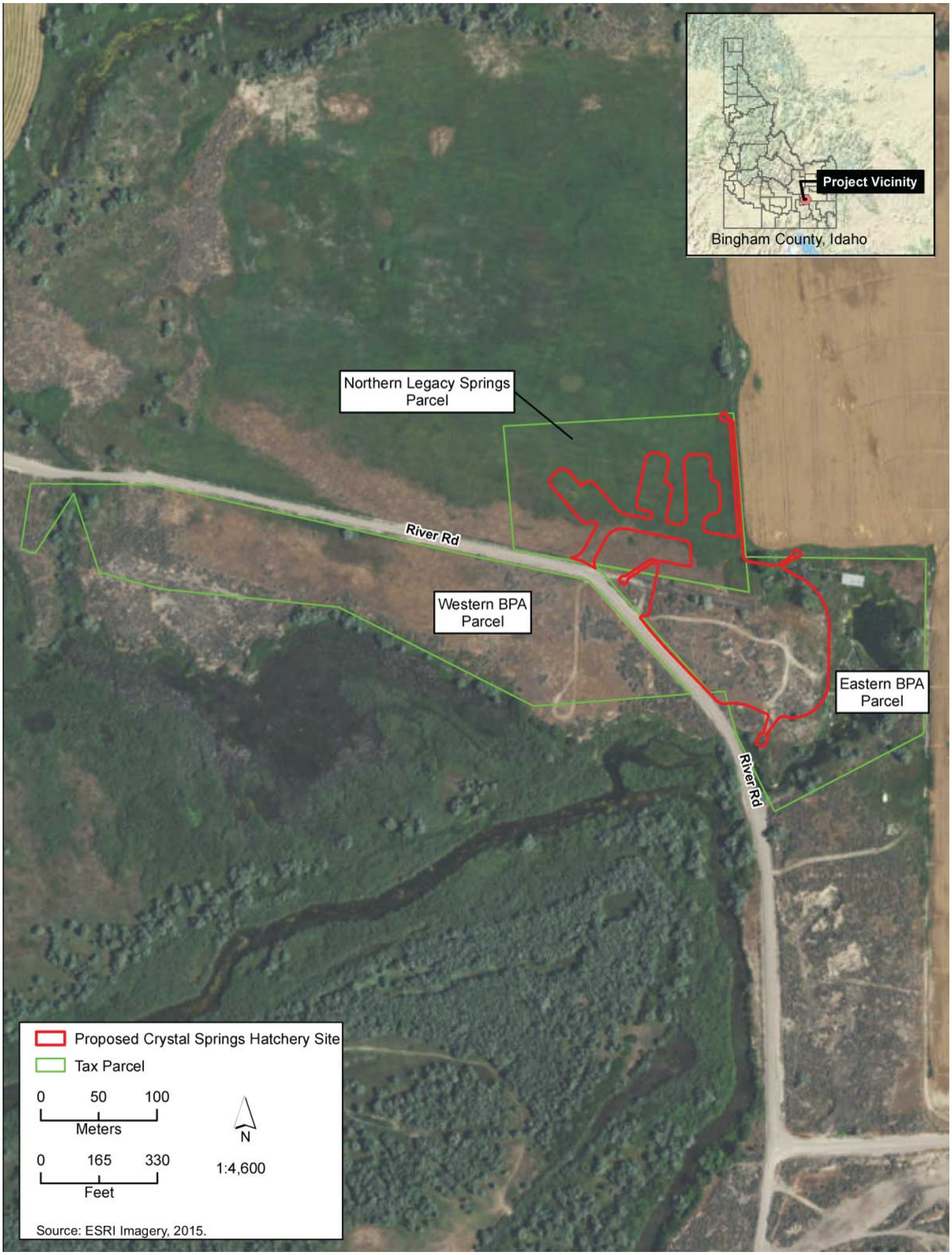
The proposed hatchery would be located in Bingham County, 2.9 miles southeast of the town of Springfield in southern Idaho. The site is adjacent to McTucker Creek and consists of three parcels: the east parcel (approximately 9 acres) on which the proposed hatchery facilities and wells would be located, the north Legacy Springs parcel (approximately 6.5 acres of the 660-acre Legacy Springs Wildlife Area, owned by the Tribes and on which BPA holds a conservation easement) on which the hatchery staff residences would be located, and the south parcel (approximately 10.7 acres) proposed for management as wildlife habitat (Figure 2-1). These parcels, which BPA purchased for the hatchery, are bordered by private land to the east and Bureau of Reclamation property to the south.

The Legacy Springs parcel is north of and adjacent to the east parcel, where the proposed fish hatchery would be located. The south parcel is located south of the site on the south side of River Road. A conservation easement covers the Legacy Springs parcel that precludes construction of residences directly on the property. However, a land management swap between the Legacy Springs parcel and the south parcel would allow residences to be built on the northern Legacy Springs parcel adjacent to the hatchery while ensuring that a conservation easement of commensurate size would be retained on the south parcel. Should a land management swap between the Legacy Springs parcel and the south parcel not be feasible, alternative locations for the residences would be explored and evaluated.

The east parcel has a former commercial trout hatchery on site that consists of a small building, six artesian wells in which naturally pressurized groundwater comes to the surface, some deteriorated outdoor concrete raceways, and a series of ponds fed by water discharged from the wells. There are no structures on the south parcel or the north Legacy Springs parcel.

Topography of the property slopes gradually from higher ground on the north and west property boundary to a series of wetland ponds along the south and east boundaries. The ponds, which collect flow from artesian wells and potentially from subsurface flow, are connected by short channels extending from north to south. An existing 36-inch culvert conveys water from the ponds beneath River Road, where it flows into McTucker Creek, a tributary to American Falls Reservoir in the Snake River basin. The old trout hatchery facilities are not usable. Because they are located in wetland areas, they would be left in place so as not to impact the existing wetlands.

**Figure 2-1. Proposed Crystal Springs Hatchery Site**



### 2.1.1.2 Hatchery Elements

The proposed new hatchery infrastructure would encompass about 6.25 acres of the approximately 9-acre eastern parcel, and 3.75 acres of the approximately 6.5-acre northern parcel for the hatchery staff residences, and would consist of the following elements:

- A single story, 15,600-square-foot hatchery building
- An 1,800-square-foot vehicle maintenance and shop building
- Fifteen outdoor, 30-foot-diameter circular rearing ponds
- Three new groundwater wells and retrofitting of two existing wells
- A concrete settling pond, about 12 feet wide by 30 feet long by 3 feet deep
- A 24-inch diameter, 180-foot-long effluent pipe from the settling ponds to McTucker Creek
- Three residential houses for employees
- Four septic systems and drain fields
- Reuse and reroute of an existing powerline
- Relocation of an existing private irrigation line serving a neighbor's land
- Parking lot and turn around area

A new hatchery building, approximately 15,600 square feet in size, would be constructed on the central portion of the hatchery site. The facility would be divided into two separate zones constructed with different materials. One zone would consist of a wood framed 3,850-square-foot administrative area containing offices and work stations for hatchery staff along with support spaces including a copy area, conference/break room, mud rooms, restrooms, and visitor functions.

The second zone would be an 11,750-square-foot main hatchery area which, due to its wetter environment, would be constructed of noncombustible, moisture resistant materials. The largest spaces in the hatchery building would be used for incubation and indoor rearing and would include rectangular and circular fiberglass fish tanks and incubators, grated floor trenches, and overhead water supply piping. Feed storage, dry storage, chemical storage, incubation and water treatment rooms would also be included. The feed storage room would include a walk-in freezer.

An 1,800-square-foot shop building would have two rooms—one for vehicle and equipment maintenance activities, and the other for shop activities such as metal and wood fabrications.

The 15 outdoor rearing ponds would be cast-in place concrete or fiberglass 3,800-cubic-foot circular ponds, 30 feet in diameter, and 6 feet average depth. Nine of the fifteen ponds would be dedicated to the Yankee Fork weir facility, with the remaining six ponds dedicated to the Panther Creek weir facility.

Approximately 630 gallons per minute of groundwater would be supplied to each pond (see Section 2.1.1.3, *Water Supply*). A metal roof structure with open sides covered by bird netting would be constructed over the outdoor ponds to provide shade and predator protection and to reduce algal growth in the ponds. The outdoor ponds would utilize a dual drain system. Approximately 85% of the drain water would overflow through a sidewall drain box. This clarified water would discharge through the outfall to McTucker Creek. The remaining 15% of the drain water would flow through a center bottom drain, which would concentrate fish wastes and uneaten feed into a separate piped system that flows by gravity to the settling pond (see Section 2.1.1.4, *Effluent Treatment Facilities*).

The three new residences for hatchery staff would be modular 2,000-square-foot homes, located to the north of the hatchery building on the northern Legacy Springs parcel. Each three-bedroom residence would have its own driveway and detached garage (Figure 2-2). Each residence and the hatchery would have a separate septic tank and a 100-foot-long, 3-foot-wide, 4-foot-deep drain field for domestic water uses.

Electrical service for the hatchery and the residences would be provided by Idaho Power via an existing overhead three-phase powerline that currently bisects the proposed outdoor pond area. This powerline would be re-routed to the proposed facility. A new pad-mounted transformer and three-phase underground electrical service would be provided to the new buildings and well pumps. The Tribes have discussed the project with Idaho Power, which is willing to work with the Tribes once permissions are granted for the construction of the hatchery facilities.

A total of 15 9-foot-by-9-foot parking spaces are proposed within the hatchery property for visitor parking.

The hatchery and residences would be fenced with a Class A, four-wire perimeter livestock exclusion fence with two 20-foot-wide entrance gates to control vehicle site access.

#### 2.1.1.3 Water Supply

Water for hatchery operations, as well as potable water for both the residences and the hatchery administrative office areas, would be provided from groundwater wells (Figure 2-3). Hatchery operations would require a peak demand of 23.2 cubic feet per second (cfs). The former trout hatchery had a 24.7 cfs water right that would be used for the new hatchery. A preliminary review of water rights indicates that the existing water right is designated for beneficial use on the eastern parcel only and would be used to supply water to the hatchery. Water use by residences proposed for construction on the northern Legacy Springs parcel would require a formal water right transfer or new water right.

Water demand varies depending on water use requirements for fish production during the year. As the fish grow larger through the year, more water is required for rearing. Table 2-1 illustrates projected monthly water requirements for the proposed hatchery.

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**Figure 2-2. Proposed Crystal Springs Hatchery Facilities**

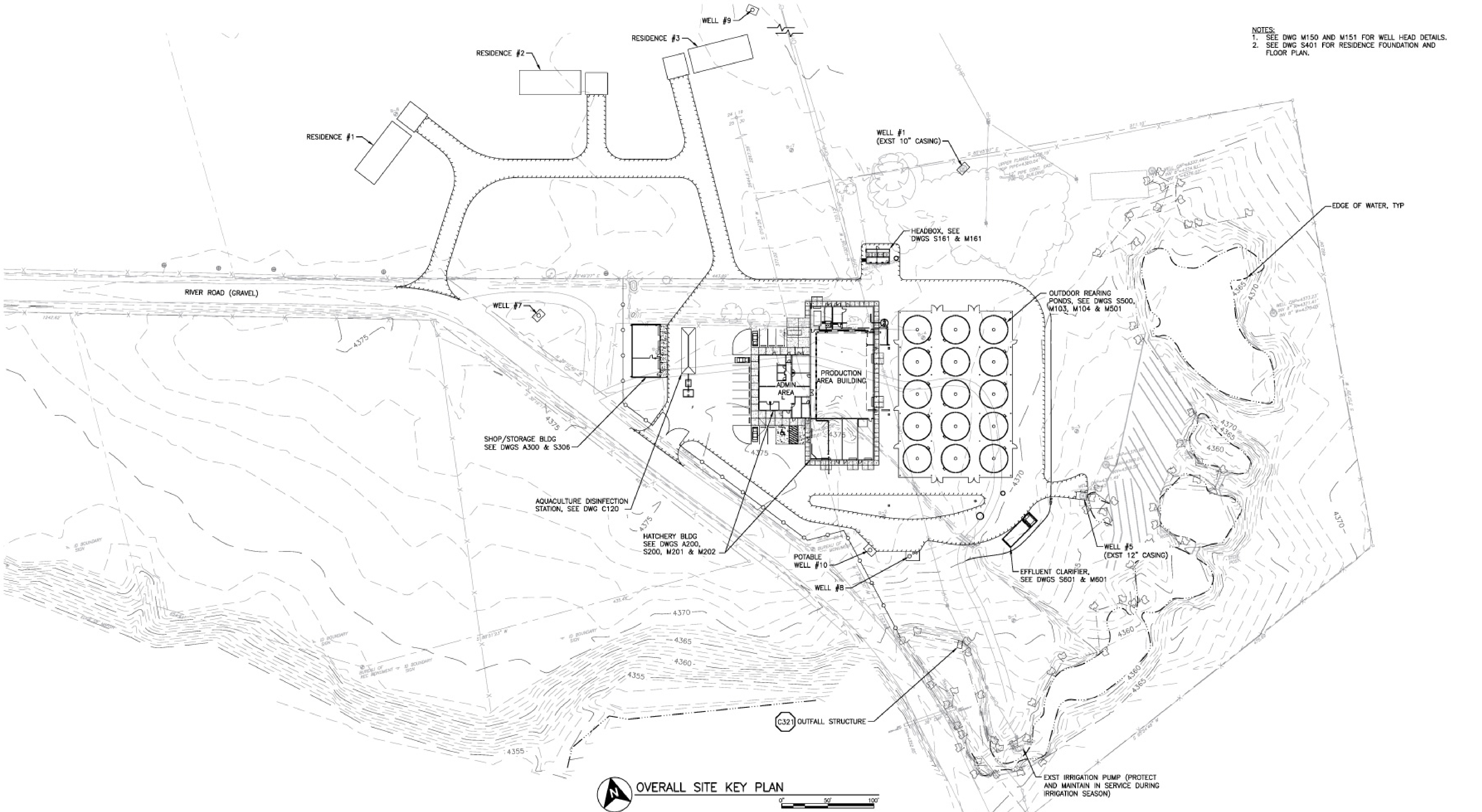

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**Figure 2-3. Wells at the Crystal Springs Hatchery Facility**

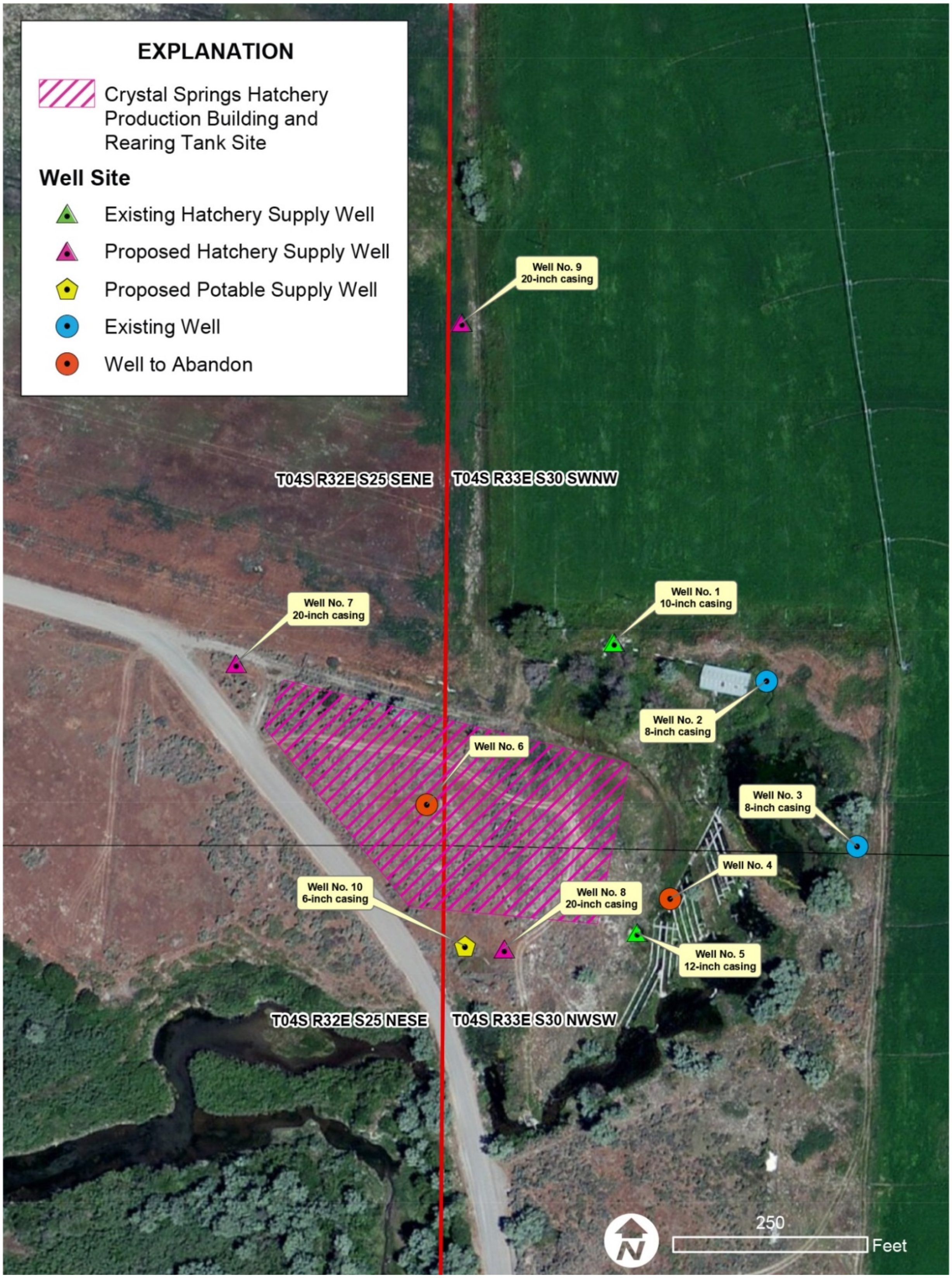


**Table 2-1. Projected Monthly Water Requirements for Crystal Springs Hatchery**

| Month | Water Requirement (cubic feet per second) |
|---|---|
| January | 17.3 |
| February | 20.7 |
| March | 23.2 |
| April | 3.1 |
| May | 4.1 |
| June | 5.2 |
| July | 6.3 |
| August | 8.0 |
| September | 9.5 |
| October | 11.3 |
| November | 13.1 |
| December | 15.1 |

Water would be obtained via three new wells and two existing wells (Figure 2-3). The remaining four existing wells cannot be used because two are within the footprint of the hatchery construction and have to be abandoned, and the other two are not appropriately cased or fitted with pumps to accommodate the increased water demand at the hatchery facility. In addition, the latter two wells would require a great deal of energy to pump water to the hatchery headbox before distribution of the water through the hatchery system. The proposed wells provide for the most energy and cost efficient configuration for the proposed hatchery.

The three new wells (Wells No. 7, No. 8, and No. 9) would be 20- to 24-inch diameter wells with filter packed casings and stainless steel well screens (Figure 2-2). The wells would be about 160 to 280 feet deep and each well would be designed to produce up to 10 cfs, or nearly half of the projected total peak demand of hatchery operations. The two existing artesian wells (Well No. 1 and Well No. 5), would produce a combined capacity of 2.6 cfs and would be fitted with pumps to help meet peak flows when needed.

Appendix E of the Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011) provides a detailed report on well development and pump selections. Separate groundwater transmission pipelines would be routed underground from each well to the central headbox with flow metering and control valves to help match flow and demand. Artesian pressure is sufficient to deliver some of the required flow to the hatchery, rearing ponds, and raceways without pumping. Obtaining peak flow rates needed in February and March (prior to smolt outplantings) would require pumping to deliver a sufficient water supply to the hatchery.

#### 2.1.1.4 Effluent Treatment Facilities

Hatchery effluent, including stormwater runoff from the site, would be channeled through a concrete dual-chambered settling pond, before being combined with overflow drains that would discharge through an approximately 180-foot-long pipe into McTucker Creek.

The effluent treatment system has been designed to filter then settle out solids from the cleaning operations in the hatchery building and concentrated wastes from the outdoor rearing pond bottom drains. The configuration of the rearing ponds and the settling pond has been designed to produce effluent that will meet discharge limitations that will be required under the General National Pollutant Discharge Elimination System Permit (NPDES) for Aquaculture Facilities in Idaho subject to wasteload allocations (Idaho NPDES General Permit No. 130000; EPA 2007).[2]

The settling pond would be approximately 12 feet wide by 30 feet long. The chamber bottom would be 3 feet deep and flat along the bottom. As suspended solids settle in the chamber bottom, the clarified water would flow to the drain piping system for the hatchery, which discharges to McTucker Creek. Any accumulated sludge would be pumped from the treatment system on a semiannual basis while still saturated and distributed as a fertilizer to the nearby Legacy Springs Wildlife Area.

This type of dual drain rearing pond has been found to concentrate approximately 90% of total suspended solids in the 15% of the flow leaving the ponds continuously through the bottom drains. The bottom drain flow rate of 100 gallons per minute per pond results in a normal peak flow of 1,500 gallons per minute to the waste drain system, which would receive treatment prior to discharge from the facility into McTucker Creek. The proposed treatment system consists of a micro-strainer rated for 60 micron particle removal followed by a settling basin to treat the concentrated wastes resulting from the micro-strainer backwash process.

The design follows the guidelines of the Idaho Department of Environmental Quality and the U.S. Environmental Protection Agency (EPA) for confined animal feeding operations. Effluent limitation guidelines and standards for aquaculture facilities apply to the discharge of pollutants from a concentrated aquatic animal production facility that produces 20,000 pounds of fish or more per year are outlined in the NPDES permit.

#### 2.1.1.5 Yellowstone Cutthroat Trout Facilities

The Yellowstone cutthroat trout facilities proposed at the Crystal Springs hatchery would include small-scale adult fish holding tanks for broodstock, one stack of incubation trays, and several round tanks for early rearing. A 1,600-square-foot room at the south end of the hatchery production building would be dedicated to Yellowstone cutthroat trout production. This room would have four incubation stacks, two 6-foot-diameter tanks for adult holding, and six 8-foot-diameter tanks for rearing fish to sub-catchable size (5 to 6 inches). Supply piping would be routed to the necessary Crystal Springs hatchery water in a floor trench that would also serve as the main drain from the incubation stacks and rearing vessels. Each stack and vessel would have an isolation valve for flow control. The circular tanks would have external standpipes for water level control. These facilities would occupy space adjacent to the Chinook salmon early rearing spaces inside the proposed hatchery building. To reduce disease concerns, the Yellowstone cutthroat trout room is designed and would be managed as a biosecure area (i.e., appropriate work practices and suitable protective equipment and clothing would be used to prevent disease transmission) from the Chinook salmon incubation and start-up rearing areas. Both water supplies and effluent would be separate from the Chinook piping systems.

[2] See Chapter 4 for detailed summaries of applicable existing regulations.

#### 2.1.1.6 Construction

For construction of the hatchery, outdoor rearing ponds and raceways (approximately 6.25 acres of the 9-acre eastern parcel) would be stripped of organic materials to a shallow depth in preparation for gravel bases and concrete foundations using heavy equipment such as excavators and loaders. Gravel would be imported for the base and surfacing for access roads, driveways, and parking and circulation areas. Geotextile would be used during construction at the hatchery site to prevent the migration of soil. Some rock excavation would be required due to the presence of a bedrock shelf that underlies the hatchery building and outdoor rearing pond areas. Initial site grading and preparation would occur during the dry season of June through October to minimize stormwater runoff to surface waters and include several construction best management practices (BMPs). The BMPs (described in Chapter 3, *Affected Environment and Environmental Consequences*, and listed in Table 2-9) would include a spill containment plan (i.e., spill pollution, control, and countermeasures plan; see Section 3.5, *Groundwater and Surface Water Quality and Quantity*), invasive species control plan (see Section 3.4, *Vegetation*), and erosion control plan (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*) for all areas disturbed by construction activities.

Depending on weather conditions and the start of construction, the hatchery facility could be completed in fourteen months; however, an eighteen month timeline has been developed as a reasonable estimate for the total construction time frame if the hatchery is built.

On the northern Legacy Springs parcel, approximately 3.75 acres of the 6.5-acre parcel would be disturbed for construction of staff housing. The site would consist of three residences, and their associated garages, septic fields, and driveways.

### 2.1.2 Fish Trapping Weirs

The Tribes are proposing to develop permanent fish trapping weirs in two locations—Yankee Fork and Panther Creek—to catch, hold, and spawn adult Chinook salmon to obtain eggs and milt for the hatchery, manage returning adult Chinook salmon, and monitor Hatchery Program success in meeting production and adult return numbers. In comparison to temporary weirs, permanent weirs would be expected to operate for longer periods without failing and, thus, more efficiently capture returning adult salmon. Weirs would be designed in coordination with the National Marine Fisheries Service (NMFS) to meet fish passage criteria (NMFS 2011a). The Tribes currently use the Yankee Fork location for trapping fish with a temporary weir, which is placed in the river only during the upstream Chinook salmon run (mid-June through early September).

#### 2.1.2.1 Yankee Fork Weir Facility

Under the Proposed Action, a new permanent fish trapping weir and fish holding, spawning, and juvenile fish acclimation facilities would be built at the Yankee Fork location. The weir site on the Yankee Fork would be on USFS-managed land at Pole Flat Campground (Figure 2-4). Several factors were considered in siting the proposed facilities at this location. First, the Tribes currently use this location and have set up a temporary weir and a temporary field station on opposite sides of the heavily used Yankee Fork Road. At the weir site, the road is immediately adjacent and parallel to the top of the left bank (eastern bank) of the Yankee Fork. This creates a safety hazard to hatchery personnel as the road is wide and straight, and much of the current traffic travels along this road at a high rate of speed, which poses a hazard to both field personnel and to recreational users (e.g., at the Pole Flat Campground). The proposed design includes a curve in the road that will serve as a traffic calming feature, and will create a safer intersection for access to both the proposed weir facilities and the Pole Flat Campground.

The existing onshore work area for the weir (fish handling area) is on the opposite side of the road from the weir. The proposed facilities would include the weir, adult fish holding and handling facilities, juvenile acclimation facilities, and crew and equipment accommodations (Figure 2-5). Eggs would be transported from the Yankee Fork weir facility to the Crystal Springs hatchery for hatching and rearing. Once the Chinook salmon are ready for release, they would be transported by truck back to the Yankee Fork weir facility for acclimation and release in Yankee Fork.

**Figure 2-4. Proposed Site for the Yankee Fork Weir Facility**

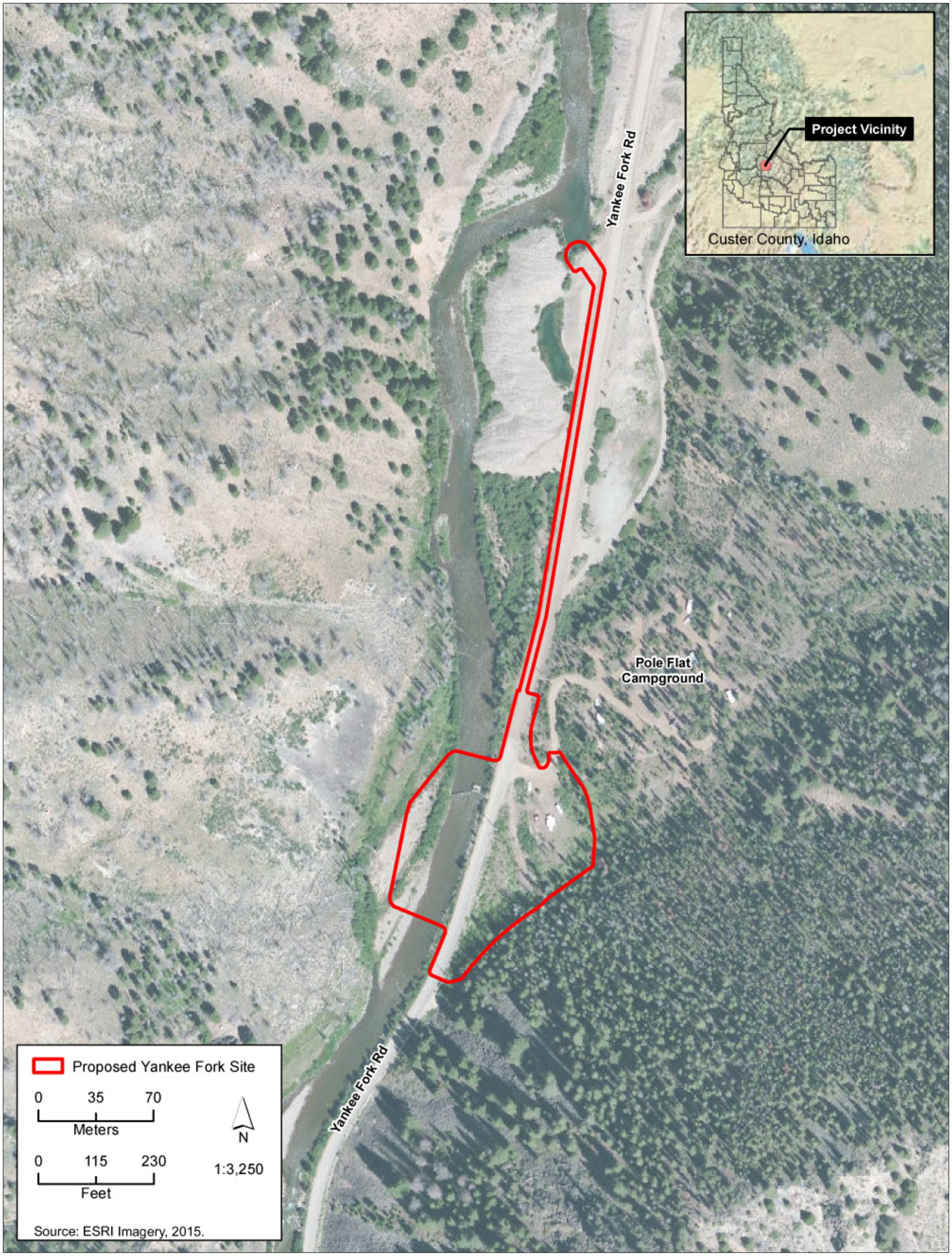
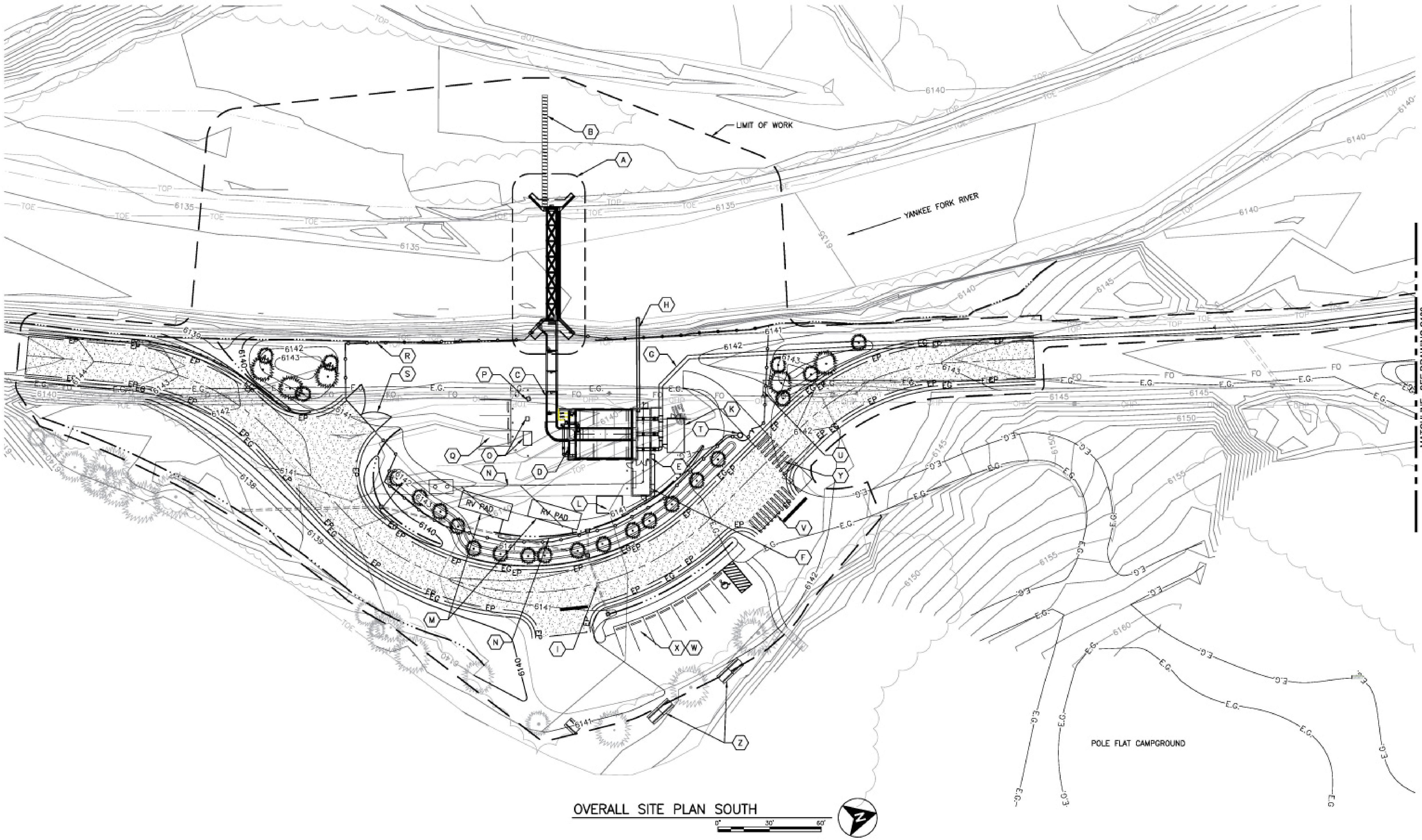


**Figure 2-5. Proposed Yankee Fork Weir Facility**




SHEET KEY NOTES:

A. BRIDGE WEIR, SEE DWGS S120–S135.
B. TEMPORARY PICKET WEIR BY OWNER.
C. FISH LADDER, SEE DWGS S140–S152.
D. ADULT HOLDING PONDS, SEE DWGS S144–S147.
E. SPAWNING AREA, SEE DWGS S153–S154.
F. EGG PREP AREA, SEE DWGS S153–S154.
G. SITE PIPING, SEE DWG M103.
H. FISH RETURN PIPE.
I. STORM WATER SYSTEM.
J. NOT USED.
K. CHEMICAL STORAGE SHED.
L. PRE-ENGINEERED METAL BUILDING MECHANICAL STORAGE SHED.
M. RV PADS WITH HOOK-UPS FOR WATER, POWER, SEWER (30' X 10').
N. SITE UTILITIES, SEE DWG C130.
O. ELECTRICAL GENERATOR SET, POWER PANELS AN METER.
P. ELECTRICAL SERVICE (EXISTING POWER POLE).
Q. PARKING.
R. SECURITY FENCE.
S. SECURITY GATE.
T. DOMESTIC WELL.
U. RELOCATED FIBER OPTICS LINE.
V. CAMPGROUND ENTRANCE.
W. CAMPGROUND PARKING.
X. VISITOR PARKING.
Y. PEDESTRIAN ACCESS.
Z. RELOCATED PICNIC TABLES.

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## Construction Components

### Bridge Weir

A new 65-foot-long bridge weir is proposed to be located a short distance downstream of the existing temporary weir site in order to locate the ladder entrance at a more defined stream bottom near the left bank of Yankee Fork. This weir would allow water to flow through, but would limit fish passage and direct fish toward the fish ladder. On the left bank looking downstream (eastern bank), the embankment for Yankee Fork Road is approximately 2 feet above the 100-year floodplain. On the right bank (western bank), lower lying ground could result in flood events occasionally bypassing around the right bank bridge weir abutment. In the event of a high-flow event resulting in the Yankee Fork overtopping its bank, Tribal operators may need to deploy a temporary picket weir to extend the weir on the right bank to seal off fish passage.[3] Prior to construction, the weir design will be reviewed by NMFS to ensure compliance with fish passage criteria (NMFS 2011a).

The bridge weir would be supported by concrete abutments extending down to a foundation on each side of the stream channel. The weir sill would utilize U-shaped pre-cast concrete sections excavated approximately 7 feet into the stream bottom. The U-sections would be backfilled with cobbles and gravel and would then receive a topping slab (a flat segment of concrete) to create the sill. Gates to control stream flow elevations would be mounted onto the concrete weir sill at the stream bed elevation up to the walkway. The bridge portion of the weir would be steel construction, spanning the width of the Yankee Fork. Rotating picket panels would attach to the upstream edge of the bridge and drop into place to seal against the concrete sill. Chain link fences and gates would be used to prevent public access to the bridge structure. Signage would be provided to indicate a portage around the right abutment for water craft floating the river.

Examples of a bridge weir fully constructed and a bridge weir in operation are presented in Figures 2-6a and 2-6b.

[3] Deployment of this temporary picket weir would be limited to high flow events (when the Yankee Fork overtops its bank) during the early June Chinook salmon trapping season. It is anticipated that this would be an extremely rare occurrence and is included in the design in the event of an unusual water year.

**Figure 2-6a. Example of Bridge Weir Fully Constructed (South Fork Salmon River Bridge Weir)**

**Figure 2-6b. Example of Bridge Weir in Operation (South Fork Salmon River Bridge Weir)**

### Jib Crane

A jib crane is a permanent crane that would be installed adjacent to the bridge weir and used to remove debris from the weir and possibly for lifting fish for transfer to transport trucks or from a live box to the holding pools if the fish ladder is not effective at attracting fish during certain times (e.g., during low flow).

### Fish Ladder

A fish ladder is a structure on or around a natural or artificial barrier that helps fish to naturally migrate upstream or downstream of the artificial barrier. A half-Ice Harbor fish ladder design[4] would be used because of the relatively constant flow of water that would be available. This type of ladder uses both openings and weirs to draw fish into the ladder. The 2-foot-by-3-foot ladder entrance would be built into a precast concrete weir abutment, just downstream of the weir picket panels. A vertical bar gate would control access into the fish ladder. A canal gate would also be installed to control water flow and completely isolate the ladder from the river for maintenance purposes. On average the ladder pools would be 12 feet long and 5 feet wide with a water depth of 5 feet. The Yankee Fork ladder would consist of 5 pools terminating at the finger weir into the pre-sort holding pond for the collected adult salmon. The ladder would function within the range of high and low water elevations of 6,139.0 and 6,135.0 feet above mean sea level, respectively. During high flows, the ladder pools would be backwatered by the river but would not affect the function of the ladder. Prior to construction, the ladder design will be reviewed by NMFS to ensure compliance with fish passage criteria (NMFS 2011a).

### Adult Holding Ponds

Holding ponds for the collected adult salmon would be constructed adjacent to the weir on the east bank of the Yankee Fork. The ponds would be made of reinforced concrete walls and slabs. Fish migrating up the ladder would pass over a finger weir that would separate fish between the fish ladder and the pre-sort holding pond, preventing the fish from returning to the ladder. The pre-sort pond would be 6 feet wide and would be dedicated to holding adult fish prior to sorting. After sorting, fish would be placed in one of the two post-sort holding ponds. Pass-through gates would be provided in the pre-sort pool walls to minimize the amount of lifting required to move fish for the pre-sort to post-sort pools.

### Egg Collection and Preparation Structures

Adjacent to the three adult fish holding ponds, a three-sided structure would be built for collecting, fertilizing, and disinfecting eggs from the adult fish and a fully enclosed metal-sided one-story structure would be built for temporary egg storage prior to transport.

### Chemical Storage

A 10-foot-by-20-foot pre-fabricated chemical storage building containing built-in spill containment and explosion-proof construction would be installed adjacent to the fish holding ponds (to the north) to hold formalin and iodophor. Formalin would be used for adult salmon treatments during

[4] This design consists of one weir barring upstream migration, a fish ladder to move adults into the fish trap, a pre-sort holding pool (the terminus of the fish trap), two adult holding ponds (one on either side of the pre-sort pool), and a return pipe upstream of the weir for any natural-origin fish to return directly to the river.

holding and sorting, and iodophor would be used to disinfect eggs after spawning and fertilizing for transport to the hatchery facility (see Section 3.5, *Groundwater and Surface Water Quality and Quantity,* for more information on formalin and iodophor). The formalin would be pumped from barrels in the chemical storage shed underground to the water supply in the post-sort holding ponds. The chemical storage shed would hold an entire operating season's quantity of formalin (eight 55-gallon barrels) and iodophor (5 liters), as well as the pumping and distribution piping. At the end of each season, the storage container would be removed and inspected prior to being deployed the next season. A chemical storage and containment plan would be developed as part of the Hatchery Program.

#### Hopper Structure

A fish hopper is a holding box and piping structure that aids in the transfer of fish from one holding pond to another. The hopper would measure approximately 6 feet by 6 feet.

#### Collection Facilities

At the Yankee Fork adult collection facilities, sorting and processing activities would primarily take place in the spawning area. The egg preparation building would be utilized to store the eggs after spawning, along with egg transportation equipment. Both facilities would be located adjacent to the upstream end of the pre-sort and post-sort holding ponds.

#### RV Pads

Two 30-foot-by-10-foot areas would be graded and graveled to be able to park two RVs that would house employees during the adult trapping season. Human waste would be collected in a holding tank and would be pumped out as needed (i.e., disposed of off site at an RV septic service or through a disposal service used by the USFS to service the Pole Flat Campground).

#### Yankee Fork Road Alignment

About 425 feet of the existing paved road would be removed and a new 675-foot section of road would be constructed to the east and curved to circumvent the weir site. According to the Tribes' discussions with Custer County Commissioners, the road realignment and construction would likely require additional evaluation for their approval (pers. comm. Stone 2016a). The road would consist of the same look and materials as the existing road section and would include landscaping berms and signage to increase the safety of the road features and minimize visual effects. It would provide three new access points to the lands adjacent to the road; one would access the facility, one would access a new public parking area for visitors to the facility, and one would provide a new entrance to Pole Flat Campground, adjacent to the site. Once the new section of road was completed, the traffic would be rerouted to the new section, and the old road section would be converted to use for the Yankee Fork weir facility (most of the road would be removed; some portions would remain for facility use). The speed limit for the new, curved section of road would be set at 20 miles per hour. Construction BMPs would be implemented to minimize the potential for stormwater runoff to surface waters (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*). The realignment would be designed to provide a safe work environment by routing through-traffic around the trapping facility and the holding ponds. The design would meet state highway standards, and would meet appropriate code requirements for horizontal and vertical curves, sight distances, and roadway design.

### Water Source

If approved for construction, the Tribes would apply for a non-consumptive water right from the Idaho Department of Water Resources to operate the Yankee Fork weir facility. The water would flow through the facility back to the river without loss. The distance between the intake and the discharge through the fish ladder is approximately 1,260 feet. It is anticipated that the water required for the facility would be 10 cfs, approximately less than 5% of average stream flow. Potable water for the RV units would be provided by a small domestic well and would also be brought in by staff from one of the other Tribal facilities in the area (Clayton or Stanley).

### Water Discharge

The water used at the facility would pass through the holding ponds, collect into the fish ladder, and discharge back to Yankee Fork through the ladder entrance. Chemicals that would be used for operations would include iodophor (a chemical containing iodine used to disinfect fish eggs), or formalin (to prevent fungus growth on the eggs). During adult holding, individual fish may be given injections of Erythromycin-200, oxytetracycline, or other prophylactic treatments to counter specific diseases. 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 (EPA 2006). These chemicals would be stored in a chemical storage shed that would hold an entire operating season's quantity of formalin and iodophor, as well as the pumping and distribution piping. At the end of each season, the storage container would be removed and inspected prior to deploying it the next season.

### Water Intake

A gravity-flow intake for the collection facility water supply would be located approximately 1,100 feet upstream of the site. The proposed intake screen would be a self-cleaning cone screen installed in a pre-cast concrete structure built into the stream bank in order to protect the screen from vandalism and to provide maintenance access. The intake screens would meet NMFS criteria for juvenile fish protection (NMFS 2011a). The intake site would be on a large eddy, isolated from the stream thalweg (line of lowest elevation within a stream). Angled wingwalls would provide for sweeping velocity across the screen face during high water when juvenile fish are most likely to be migrating downstream. A 24-inch supply pipeline would be buried a minimum of 36 inches subsurface and would route from the intake screen to the facility along the west side of Yankee Fork Road. The pipeline would discharge into the holding tank diffusers. The water would pass through the holding pools and ultimately collect into the fish ladder. The water would discharge back to Yankee Fork through the ladder entrance. The majority of the existing fill would be removed during stripping of topsoil (if any is encountered) at the Yankee Fork site. Any excavated topsoil would be removed and stockpiled for reuse as landscape fill during the revegetation phase of construction, where native plants would be placed along the disturbed areas.

### Juvenile Acclimation Pond

Existing off-channel ponds located on USFS land about 0.25 mile upstream of Pole Flat Campground, adjacent to the Yankee Fork, would be used to acclimate juvenile fish prior to release (Figure 2-7). These ponds would receive juvenile fish trucked in from the hatchery for short-term acclimation and stress relief. The Yankee Fork ponds would provide short-term holding of at least 165,000 fish at 10 fish per pound.

**Figure 2-7. Yankee Fork Fish Acclimation Ponds**

### Construction Activities

All facilities would be constructed during the work window for in-water work during a single season (likely in late summer or early fall, depending on ESA consultation outcome), and during the dry season of June through October for the upland work. Road grading and re-alignment would occur in close coordination with Custer County and the USFS to avoid any unnecessary complications with visitors to the Yankee Fork or local residents. In total, the proposed construction period would not exceed four months, depending on weather conditions, including mobilization and road realignment.

Materials staging and stockpile locations are not yet determined, but would be sited within the project work area, either on developed surfaces (e.g., parking areas) or in areas to be disturbed for facilities construction.

The construction would entail re-routing the main Yankee Fork Salmon River channel during fall base flows via a temporary channel for approximately two weeks. The temporary channel would be used to allow for sufficient de-watering to occur at the construction location using a sand or soil bag coffer dam and temporary pump system to clear the site and allow for anchors to be placed for the pre-cast concrete sill and abutments. A fish rescue and relocation plan approved by NMFS and the Idaho Department of Fish and Game (IDFG) would be implemented during dewatering to protect aquatic species. Upon abandonment of the temporary channel, all native plants would be returned to the disturbed area if viable, or replanted to maintain the character of the disturbed area. Construction BMPs include sediment and silt fencing downstream of the construction area and daily turbidity monitoring throughout the placement of in-stream structures.

### Operations

The Yankee Fork weir facility would be staffed by two individuals in the May-to-October period to operate the fish weir. The weir would be operated in June through September for Chinook salmon broodstock collection for the Crystal Springs hatchery. The weir would allow upstream and downstream passage by all fishes in the stream, though passage would vary depending on weir operation. During times of non-use, the weir panels would be rotated up and out of the water to avoid any possibility of interference with fish movement or flow variations. During weir use, small fish may pass through weir pickets, and any fish too large to pass on their own would be physically passed by trained staff within 24-hours using standard fish handling protocols.

Although not proposed as part of the Hatchery Program, the weir could be operated in May and June for collection of steelhead broodstock for the Sawtooth Hatchery. The collection of steelhead would not be funded as part of the Proposed Action, but through other federal or state sponsors such as IDFG. If proposed at a later date, this activity would be reviewed and analyzed under a separate environmental review process by the operators of the steelhead program. It is currently not safe to collect steelhead using temporary weirs because of river conditions (high, turbid water) during the steelhead adult migration, but it would be feasible with a permanent weir in place.

## 2.1.2.2 Panther Creek Weir Facility

BPA and the Tribes have worked with Blackbird Mine Trustees and the USFS to develop the proposal for hatchery supplementation in the Panther Creek system in an effort to restore runs of once-abundant anadromous fish. Design work is similar to the Yankee Fork trapping facility, albeit on a smaller scale due to the hydrologic conditions of the system, with a bridge supported bar-rack weir system and adult holding system. The facilities have been proposed at the USFS Cobalt District

Ranger Station administrative site, just upstream of Blackbird Creek on the mainstem Panther Creek (Figure 2-8).

The Panther Creek weir facility would consist of a bridge picket weir, a fish ladder, adult holding ponds, a spawning and egg preparation structure, acclimation ponds, pump station and valve vault, and an in-stream intake structure (Figure 2-9). Existing RV pads would be repurposed to support use by field personnel. The Panther Creek weir facility would be designed for up to 220 adult Chinook salmon. Top-hinged bridge weirs would be constructed to direct fish into a fish ladder that brings fish into a pre-sort holding pool. The ladder design flow is 10 cfs for this site. Holding pools are sized for long-term holding at 0.75 cubic feet per pound of fish, with water supply flow of 2.0 gallons per minute per pound of fish. Gravel access roads would service the fish trap infrastructure. The proposed construction components and construction activities are further described below.

## Construction Components

### Bridge Weir

A bridge weir is proposed for Panther Creek. It would be similar to the Yankee Fork weir, except that the span would be shorter, approximately 38 feet in length. Pre-cast sill, abutments, and fish ladder elements would be incorporated. The weir would consist of a pedestrian bridge spanning the stream, supported by pre-cast concrete abutments on each bank. Top-hinged rotating picket panels would be fastened to the upstream side of the bridge deck. The panels would sit on a pre-cast concrete sill to seal off uncontrolled fish passage.

### Jib Crane

A jib crane is an option included at the Panther Creek weir facility. The jib crane would be adjacent to the bridge weir. It would be used for debris management and possibly for lifting fish for transfer to transport trucks or from a live box to the holding pools if the fish ladder is not effective at attracting fish at critical collection times (i.e., during low flow).

### Fish Ladder

The ladder would be the same design as the Yankee Fork weir facility. The entrance and exit include the same design components as discussed above. The 4 ladder pools are 8 feet long and travel the required distance and elevation to the pre-sort holding pool. The Panther Creek ladder is also designed for 10 cfs flows over a range of creek elevations from 5,226 to 5,229 feet above mean sea level. The design of these pools and height of ladder allows fish to pass at different life stages. The ladder would be supported by a reinforced concrete slab extending from the east abutment sloping up to the adult holding tanks. Prior to construction, the ladder design will be reviewed by NMFS to ensure compliance with fish passage criteria (NMFS 2011a).

**Figure 2-8. Proposed Site for the Panther Creek Weir Facility**

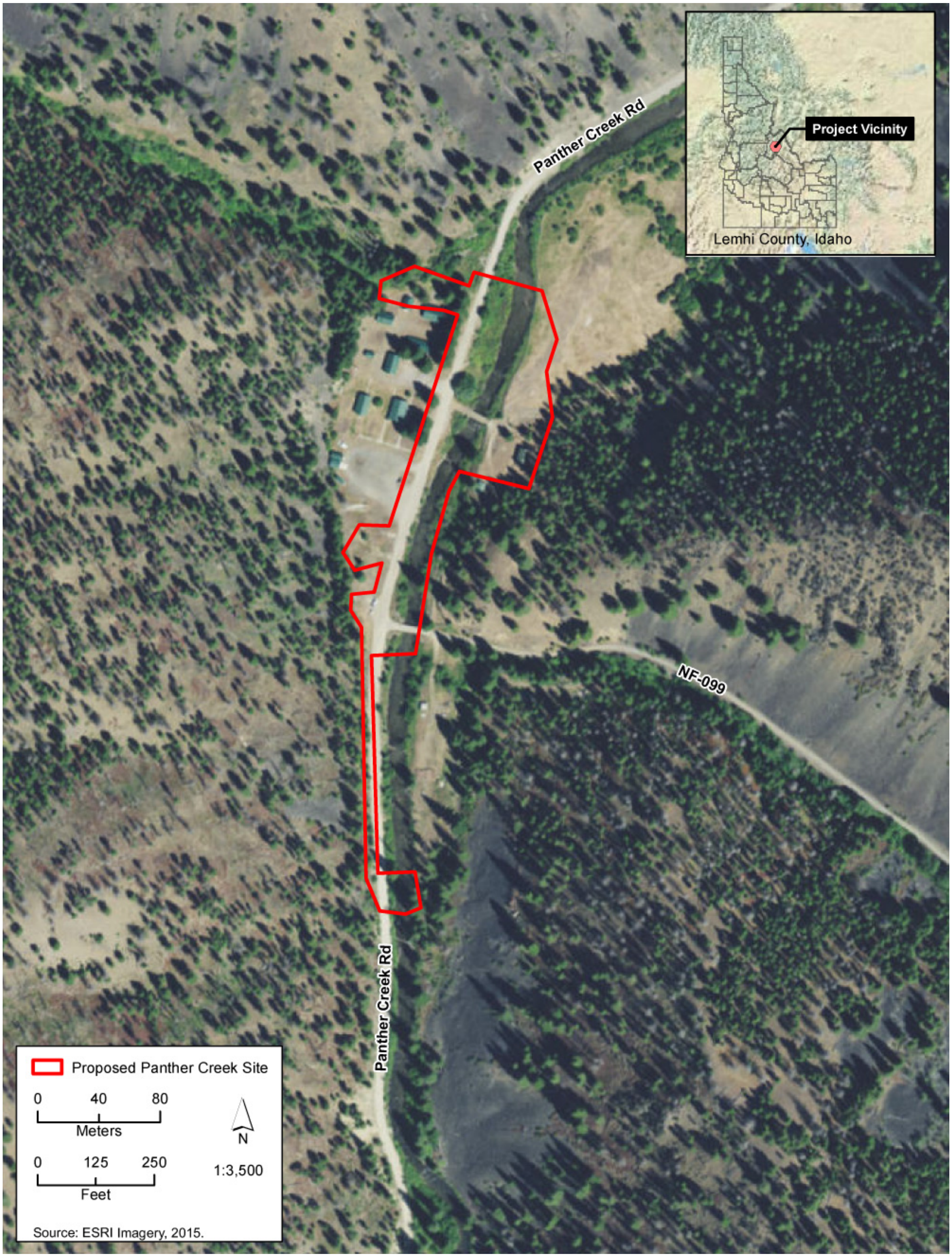
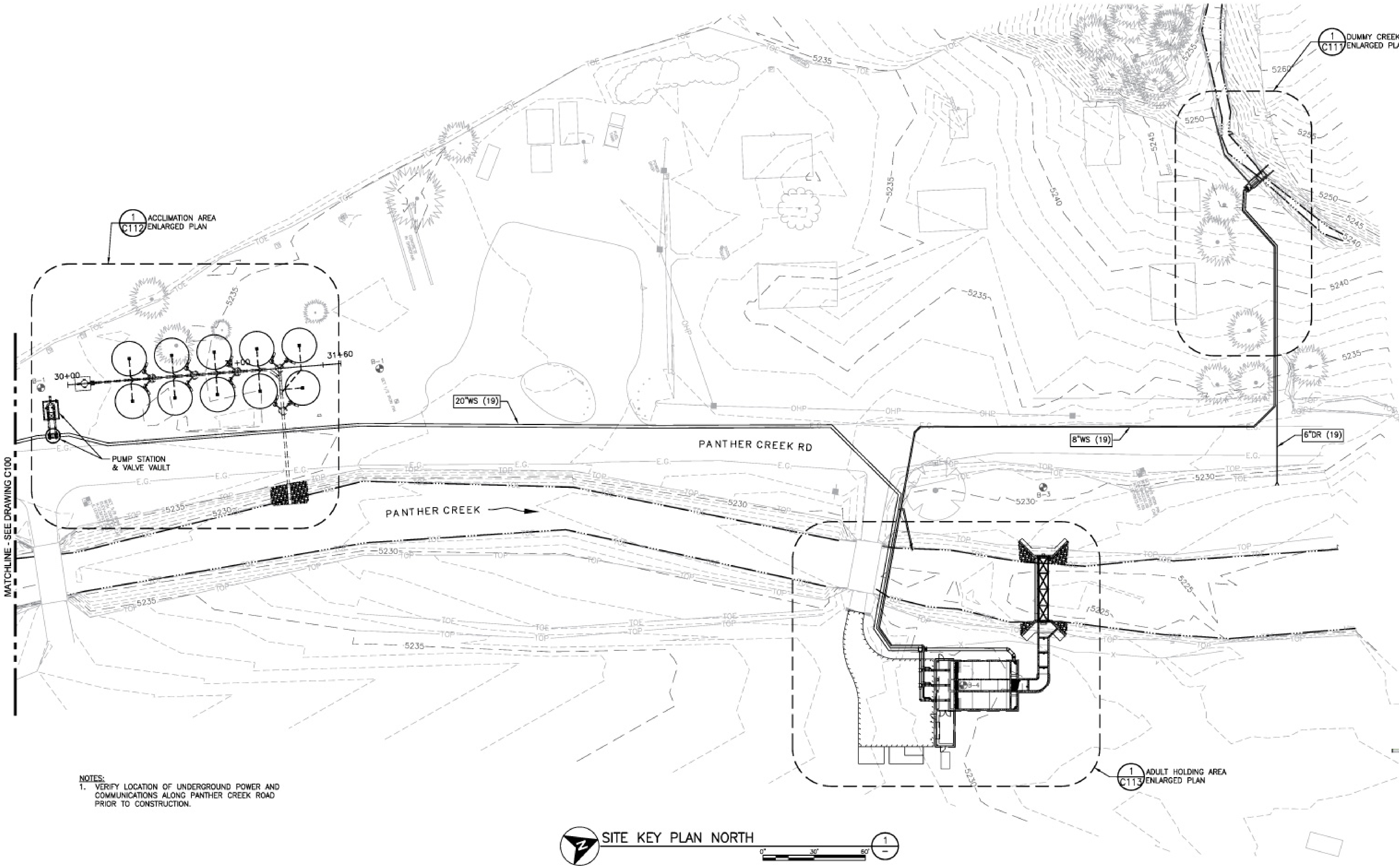


**Figure 2-9. Proposed Panther Creek Weir Facility**



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### Adult Holding Ponds

A finger weir would separate fish between the fish ladder and the pre-sort holding pond. The pre-sort pond would be 6 feet wide and dedicated to holding fish prior to sorting. After sorting, fish would be placed in one of the two 10-foot-wide post-sort holding ponds. Pass-through gates would be provided in the pre-sort pool walls to minimize the amount of lifting required to move fish from the pre-sort to post-sort pools. The ponds would be 32 feet long and designed with a 5-foot water depth. The concrete bottom of the pond would be at a similar elevation as the fish ladder, and would hold approximately 4.5 feet of water.

### Spawning and Egg Preparation Structure

The spawning structure would be three-sided and the egg preparation structure would be a fully enclosed steel structure. During high water events, primarily during peak spring run-off periods, the fish ladder would be partially submerged, and the holding ponds would need to be pumped down to allow manual crowding and sorting of the fish. A pump station with two low head/high flow pumps would be located at the downstream end of the holding ponds. The utility water pump would also be located at this pump station. Fish sorting data collection (size, weight, sex, tissue samples) and spawning activities would primarily take place in the spawning area. The egg preparation building would be utilized to fertilize, disinfect, and store the eggs along with egg transportation containers and equipment. Both facilities would be located adjacent to the upstream end of the holding ponds. Both areas would have electrical outlets, radiant heaters and hydrants supplying river water for wash down and cleaning. The spawning area would have a fish return pipe to transport native fish back to the river upstream of the weir.

### Chemical Storage

Aquaculture disinfection would be achieved through the use of formalin dosing. Formalin would be pumped from barrels in the chemical storage shed underground to the water supply in the post-sort holding ponds. The chemical storage shed would hold an entire operating season's quantity of formalin (two 55 gallon barrels), as well as the pumping and distribution piping. Fewer barrels of formalin are needed at Panther Creek because the water is colder, the holding period is shorter, and the Tribes would hold 50% fewer fish at this location under the Proposed Action.

### Access Roads

Access roads to the Panther Creek weir facility would be gravel surfaced.

### Water Source

Water would be supplied through an intake structure in Panther Creek. The water would flow though the facility and discharge back to the creek approximately 1,250 feet downstream through the fish ladder. Additional water would be supplied by an intake on Dummy Creek, to provide a colder water source for the adult holding pond as described below. If approved for construction, the Tribes would apply for a non-consumptive water right from the Idaho Department of Water Resources to operate the Panther Creek weir facility.

### Water Discharge

The water used at the facility would pass through the holding pools, collect into the fish ladder, and discharge back to Panther Creek through the ladder entrance. Chemicals that would be used for operations would include iodophor (a chemical containing iodine used to disinfect fish eggs), or formalin (to prevent fungus growth on the eggs). During adult holding, individual fish may be given injections of Erythromycin-200, oxytetracycline, or other prophylactic treatments to counter specific diseases. 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 (EPA 2006). These chemicals would be stored in a chemical storage shed that would hold an entire operating season's quantity of formalin and iodophor, as well as the pumping and distribution piping. At the end of each season, the storage container would be removed and inspected prior to deploying it the next season.

### Water Intake

A pre-fabricated cone screen would be anchored to the streambed on the left bank of Panther Creek approximately 1,250 feet upstream of the proposed weir and acclimation pond to provide a 10 cfs water supply to the adult holding tanks and acclimation ponds. An additional intake structure would be located on Dummy Creek to the west of the holding tanks and provide a 1 cfs water supply to the holding tanks only. Both of these water supplies would be provided by gravity flow. Dummy Creek water is colder than Panther Creek in the late summer and would be used to improve holding conditions for broodstock during that time period. Water temperature can affect salmonid health, and using colder water could reduce the need for chemical treatment of bacterial infections in the salmon being held. The proposed Panther Creek intake screen would be a self-cleaning cone screen installed in a precast concrete structure, and would meet NMFS criteria for juvenile fish protection (NMFS 2011a). A 24-inch supply pipeline would be buried a minimum of 36 inches subsurface and would route water from the intake screen to the fish holding tank along the west side of Panther Creek Road. Approximately 1,150 feet downstream of the intake, a 3 cfs duplex pump station would be constructed on the 24-inch pipeline to lift water into the acclimation ponds during the early spring. During the late summer to early fall adult return season, the pipeline would discharge into the holding tank. The water would pass through the holding pools and then collect into the fish ladder. The water would discharge back to Panther Creek through the ladder entrance. An 18-inch bypass pipe would allow up to 7 cfs of Panther Creek water to be routed directly to the fish ladder in order to increase the ratio of Dummy Creek water used in the holding pools. A small intake structure on Dummy Creek would consist of a screened intake in the bottom of the creek channel, wing wall abutments, and a cut-off wall to stabilize the right bank of the creek upstream of the diversion structure, and would meet NMFS criteria for juvenile fish protection (NMFS 2011a).

### Juvenile Acclimation

The acclimation of juvenile fish would occur in early spring at Panther Creek. Modular portable raceways or circular ponds would be utilized to receive juvenile fish which would be trucked in from the hatchery for short term acclimation and stress relief. The Panther Creek weir facility would be designed for up to 135,000 fish at 10 fish per pound. Water supply flows would be approximately 3 cfs at Panther Creek. Batches of fish would be acclimated and released every week or two until the stocking goals are met (maximum smolt release of 400,000 smolts annually).

#### Pump Station and Valve Vault

The lift station would be approximately 9 feet below existing grade and would pump water for the acclimation ponds.

### Construction Activities

During construction of the bridge weir, Panther Creek stream flow would be diverted away from the deep excavations for the concrete weir foundation. The depth to groundwater during field exploration in October 2012 was 4 to 6.5 feet below the ground surface at the boring locations. The groundwater level would be maintained via dewatering to a minimum of 2 feet below foundation subgrade. A NMFS/IDFG-approved fish rescue and relocation plan would be implemented during dewatering to protect aquatic species.

The majority of the existing fill would be removed during stripping of topsoil at the Panther Creek site. Topsoil was encountered in the majority of borings from October 2012 to a depth of 3 to 6 inches below existing grades. Topsoil and soil-containing vegetation and organics would not be suitable for use as structural fill or to bear structures over. As such, it would be excavated, removed, and stockpiled for reuse as landscape fill during the revegetation phase of construction where native plants would be placed along the disturbed areas.

Materials staging and stockpile locations are not yet determined, but would be sited within the project work area, either on developed surfaces (e.g., parking areas) or in areas to be disturbed for facilities construction.

All facilities would be constructed during the in-water work window (third week of July through second week of August for in-water work [Upper Salmon Basin Watershed Project Technical Team 2005]). Site grading and construction would occur in close coordination with Lemhi County and the USFS to avoid any unnecessary complications with visitors to Panther Creek or residents and would occur in the dry season (June through October). In total, the proposed construction period would not exceed four months, depending on weather conditions, including mobilization and site rehabilitation.

### Operations

The Panther Creek weir facility would be staffed by two individuals in the May-to-October period to operate the fish weir. The weir would be operated in June through September for Chinook salmon broodstock collection for the Crystal Springs hatchery. The weir would allow upstream and downstream passage by all fishes in the stream, though passage would vary depending on weir operation. During times of non-use, the weir panels would be rotated up and out of the water to avoid any possibility of interference with fish movement or flow variations. During weir use, small fish may pass through weir pickets, and any fish too large to pass on their own would be physically passed by trained staff within 24-hours using standard fish handling protocols.

Although not proposed as part of the Hatchery Program, the weir could be operated in May and June for collection of steelhead broodstock for the Sawtooth Hatchery. The collection of steelhead would not be funded as part of the Proposed Action, but through other federal or state sponsors such as IDFG. If proposed at a later date, this activity would be reviewed and analyzed under a separate environmental review process by the operators of the steelhead program. It is currently not safe to collect steelhead using temporary weirs because of river conditions (high, turbid water) during the steelhead adult migration, but it would be feasible with a permanent weir in place.

## 2.1.3 Program Operations

Hatchery production would involve artificial propagation of Chinook salmon and Yellowstone cutthroat trout. The specific methods and descriptions for Hatchery Program operations would be described in detail in the HGMPs, but in general, would include: (1) collection of eggs and milt from adult fish caught at the fish trapping facilities (this includes fertilization, disinfection of all eggs before transport to Crystal Springs hatchery), (2) transport of eggs to Crystal Springs hatchery, (3) incubation and hatch and alevins care, (4) rearing of fish within the hatchery to a release-ready stage, and (5) transport of fish to acclimation sites, and releasing of juvenile fish into the wild.

For Chinook salmon, during all life history stages (egg incubation, hatch, and juvenile rearing), eggs would be raised to the juvenile stage separately at Crystal Springs hatchery according to the water body they originated from (Yankee Fork or Panther Creek). Juvenile fish would be trucked back to the acclimation ponds near the weir sites, and then released into either Yankee Fork or Panther Creek, as appropriate, based on origin.

Yellowstone cutthroat trout production would involve incubating and raising Yellowstone cutthroat trout at the Crystal Springs hatchery in a biosecure room separate from the Chinook salmon. Catchable-sized fish reared at Crystal Springs hatchery would be trucked to an oxbow lake on the Fort Hall Reservation and released.

### 2.1.3.1 Crystal Springs Hatchery

The Crystal Springs hatchery would produce up to one million Chinook salmon smolts for release in the Yankee Fork and Panther Creek.

The preliminary operations schedule would be driven by several factors, including water temperature (a species-specific condition factor for Chinook salmon), density and flow indices. Water temperature is the primary determining factor in the development and growth rate of fish. The groundwater supply to be used for all stages of incubation and fish rearing would provide relatively constant year round water temperatures. A chilled water temperature of 4.5° C (40° F) was assumed for the winter incubation period and 10° C (50° F) was used for the early rearing and juvenile rearing periods. Table 2-1 (above) provides the schedule of water use by month.

The preliminary operations schedule covers a two-year period in order to understand and incorporate overlapping water requirements for juvenile fish (reared to a smolt stage) from two brood years on site at one time. Adult holding is an existing component of the Hatchery Program that begins each August and runs continuously through the end of October. In summary, the functions proposed at the hatchery would occur as follows:

- Egg incubation and hatch would extend from mid-August through March
- Early rearing in indoor troughs would begin in late March to April and extend through July
- Outdoor juvenile rearing would begin in August and extend through the following April

The resulting water requirements are for a peak flow of 23.2 cfs to the outdoor rearing facilities in March for a given brood year, and a demand of 4.1 cfs for early rearing supply to the successive brood year in April of each year.

The hatchery would be staffed by three full-time aquaculturists, and one administrative person. Three temporary employees would be used for approximately four months each year for adult capture, holding, sorting and spawning, and egg fertilization, disinfection, and transport.

## 2.1.3.2 Yankee Fork Chinook Salmon

### Yankee Fork Broodstock Development

The Yankee Fork Chinook salmon production would require time to transition from its current practice of using Sawtooth Hatchery stock to use of Chinook salmon captured and spawned at the Yankee Fork in order to achieve the desired adult run size goal for the Yankee Fork. A transition from Upper Salmon broodstock is preferred for the Yankee Fork for two primary reasons. First, the low abundance of adult Chinook salmon led to a management action to promote an adult return by using the nearest available stock, Upper Salmon, to develop a supplemented population using this genetic source as a donor stock. Next, the purpose of the consistent Hatchery Program is to develop a locally adapted broodstock in Yankee Fork that is distinct from the donor stock by using locally returning adult salmon to propagate the Hatchery Program's smolt releases. Engaging in this transition will allow for a locally adapted stock to be developed through the Hatchery Program that maintains a distinct relationship to its donor stock.

In an effort to start production in Yankee Fork, the Tribes have been outplanting up to 1,500 surplus Sawtooth Hatchery adult Chinook salmon to the Yankee Fork until the combined hatchery (Crystal Springs) and natural-origin adult run size is greater than 1,000 adults. It is difficult to determine when run sizes would reach this goal due to the many factors that influence run size (i.e., ocean and river conditions), but it is anticipated that it would likely be a minimum of 10 years. When more than 1,000 adults return, the Hatchery Program would use only locally returning adults for hatchery broodstock. The conservation objective, developed in coordination with NMFS, is to achieve a population with a minimum of 500 naturally spawning adults. This population would be managed as a required population for a stable broodstock source in the Yankee Fork. The harvest and cultural objective is to produce 1,000 adults for harvest by Tribal fishers using traditional and modern harvest techniques. An outline of Hatchery Program components is presented below:

- Establish a minimum natural escapement objective of 500 Chinook salmon; however, broodstock collection would be prioritized for returning adults.
- Terminate the outplanting of surplus Sawtooth Hatchery adults to the Yankee Fork and terminate the use of Sawtooth broodstock for the Hatchery Program when the natural-origin adult run size exceeds 1,000 adults.
- Collect all Yankee Fork broodstock at the Pole Flat weir. Collect a total of 358 natural-origin adult males and hatchery-origin adults at random over the entire migration run. During the run, the fish traps would be operated 24 hours per day. Jacks (male Chinook salmon that return to their freshwater stream one or two years earlier than their counterparts) would be incorporated into the broodstock at a rate determined to be appropriate as described in the HGMP in development by the Tribes and NMFS. Spawned adult carcasses would be returned to the Yankee Fork River as a nutrient source. Marine-derived nutrients in salmon carcasses have been shown to provide substantial ecological benefits to riverine ecosystems, such increasing production of native fish species, and fertilizing riparian plant communities (Naiman et al. 2009).

- Adults would be held in the proposed Yankee Fork adult holding facility, at the existing IDFG-operated East Fork Salmon River facility located 18 miles up the East Fork Salmon River from its confluence with the Salmon River, or at Sawtooth Hatchery depending on their availability to hold adults related to the Hatchery Program.

## Yankee Fork Chinook Salmon Production

The Chinook salmon Hatchery Program proposed for Yankee Fork would be implemented to achieve harvest and cultural objectives. Harvest rates would range from 1% to 8% when the total adult run-size is less than 500 fish (hatchery plus natural-origin returns). Harvest rates would increase as run size exceeds 500 adults as approved in the Tribal Resource Management Plan, which has been approved by NMFS, and is evaluated in its Biological Opinion (NMFS 2013) for the plan. A primary objective is to maintain a minimum natural escapement of 500 adults whenever possible.

The proposed Hatchery Program would be implemented in two phases, with the possibility of a third phase if sufficient numbers of natural-origin adults return to Yankee Fork. The actions proposed in each phase are described below. Though described here in some detail, final hatchery operations would be described in the HGMP for the Yankee Fork Chinook salmon program, and may be modified slightly during the future ESA review and consultation process or through adaptive management.

### Phase 1: Develop Local Broodstock.

Phase 1 of the program would emphasize the development of local broodstock. Specific adult management criteria and adult use priorities would be developed during the ESA review and consultation process or through adaptive management. Preliminary Phase 1 components are as follows:

- Outplant up to 1,500 surplus adults and release a minimum of 200,000 smolts from Sawtooth Hatchery into the Yankee Fork. Local broodstock (i.e., adults returning to Yankee Fork) would be used as broodstock, and adult returns to Sawtooth Hatchery would also be collected, as needed to supplement the Yankee Fork broodstock collection. Since Chinook salmon return to the Yankee Fork in a bi-modal run (i.e., two peaks each year, one in July, one in August), broodstock would be collected in proportion to their arrival timing at the weir so that the adult broodstock collected best represents all Chinook salmon returning to the Yankee Fork.
- Once the Crystal Springs hatchery is operational, production may be scaled up to 600,000 smolts if sufficient local and Sawtooth Hatchery broodstock (358 adults from the combined sources) is available. Of these, 200,000 would be reared at the Sawtooth Hatchery and 400,000 at the Crystal Springs hatchery.

- No integrated hatchery program objectives would be applied at this phase. The contribution of straying hatchery-origin fish (all hatchery programs combined) to natural spawning populations outside of the Yankee Fork would be maintained to less than 5%, as proposed in the guidelines of the Hatchery Scientific Review Group (HSRG) (HSRG 2004a).[5]
- Escapement priorities are: (1) hatchery broodstock, and (2) Tribal harvest and natural spawning.
- The Tribal harvest rate would be up to 8% of adult returns when the run size (at the Yankee Fork weir facility) is less than 108% of the broodstock target of 358 Chinook salmon. The harvest rate increases when the run size exceeds 108% of the broodstock target. A 108% target accounts for the potential for mortalities occurring throughout the rearing cycles in the hatchery environment. These harvest rates were established for the Salmon River basin hatchery programs in the Shoshone-Bannock Tribal Resource Management Plan (Shoshone-Bannock Tribes 2010a, Section 2.4.3), and were approved by NMFS in its Biological Opinion (NMFS 2013) of the Tribal Resource Management Plan (Appendix B). Harvest rate management included in the plan guides broodstock and escapement objectives for Chinook salmon in the analysis area.

**Phase 2: Discontinue Use of Sawtooth Hatchery Smolts Adults and Use Locally Adapted Brookstock.**

Phase 2 would be triggered when the 5-year running geometric mean return to Yankee Fork increases to 1,000 Chinook salmon (natural-origin plus hatchery-origin). Adult run sizes would be monitored at the weir. In Phase 2, the program would shift to the use of only locally returning adults for hatchery broodstock. Approximately 358 adults would be needed for hatchery broodstock to produce 600,000 smolts. Phase 2 Chinook salmon program components would be as follows:

- Escapement priorities are: (1) hatchery broodstock, and (2) Tribal harvest and natural spawning. Specific adult management criteria and adult use priorities would be developed during the future ESA review and consultation process or through adaptive management.
- Produce 1,000 Chinook salmon (natural-origin plus hatchery-origin) for Tribal harvest and 500 Chinook salmon (natural-origin plus hatchery-origin) for natural spawning. Terminate outplanting surplus Sawtooth Hatchery adults to the Yankee Fork and terminate the use of Sawtooth broodstock for this program if and when this goal is achieved. If adult returns are below 400 adults for two consecutive years, the program will return to Phase 1 management.
- A return to Phase 1 management allows for the use of Sawtooth Hatchery adults for broodstock for releases of juvenile Chinook salmon to the Yankee Fork.
- Collect all Yankee Fork broodstock at the Pole Flat weir. Collect natural-origin and hatchery-origin adults (358 needed) over the entire migration run in proportion to their arrival timing at the weir. Jacks would be incorporated into the broodstock at a rate not to exceed 10%, according to the HSRG guidelines (HSRG 2004a).
- No integrated hatchery program objectives would be applied to this phase. The contribution of straying hatchery-origin fish (all hatchery releases combined) to natural spawning populations

[5] Program fish and those released from other hatchery programs that are not integrated with a population must make up less than 5% of the natural spawning escapement, according to the HSRG recommendations (2004a). Because fish from multiple programs may contribute to escapement, coordination will be needed among hatchery programs to achieve the 5% stray rate criterion.

outside of Yankee Fork would be maintained at less than 5%, per HSRG guidelines (Paquet et al. 2011:551), through coordination with other hatchery programs.

- Harvest rates would be managed according to a set of decision rules (Appendix B) to ensure that broodstock, harvest, and natural spawning objectives are met.

**Phase 3: Develop an Integrated Harvest Program.** Phase 3 is possibleif habitat improvements proposed in the upper Salmon River and in the Columbia and Snake River basins result in substantially increased population productivity and abundance over time. While highly desirable, this is not deemed very likely in the foreseeable future. In Phase 3, the Yankee Fork component of the Crystal Springs program would be operated as an integrated harvest program consistent with HSRG guidelines for a contributing population (these guidelines reflect the conservation importance of a population within the evolutionarily significant unit [ESU], from most important [Primary], to moderately important [Contributing] to least important [Stabilizing]) (Paquet et al. 2011).

The trigger used to determine if Phase 3 would be implemented would be the 5-year running average (geometric mean) natural-origin returning adult escapement to the Yankee Fork. Phase 3 would be initiated when natural-origin returning adult escapement exceeded 750 adults.

Once this trigger is met, the Tribes would consult with NMFS to determine if managing Yankee Fork Chinook salmon as a Contributing population is needed to meet recovery objectives for the Snake River spring/summer-run Chinook salmon ESU. Regardless of the need to achieve ESU objectives, elimination of the hatchery program would be considered if the 5-year running average (geometric mean) natural-origin returning adult escapement to the Yankee Fork exceeded 2,000 adults.

With an average run-size of 2,000 natural-origin returning adults, the need for a hatchery program would be reconsidered because run-size would be sufficient to achieve all current conservation, harvest and cultural objectives identified in the Tribes' Tribal Resource Management Plan (Shoshone-Bannock Tribes 2010a). Continuation of the program might be warranted if harvest objectives are updated, particularly for Tribal communal and sport harvest.

## Yankee Fork Smolt Releases

Up to 600,000 yearling Chinook salmon smolts produced at the hatchery would be transported to the Pole Flat Campground area by a fish tanker truck, and held in acclimation ponds on site for volitional release in the spring. The smolts would be forced out after a minimum of 5 days of acclimation. On rare occasions, Chinook salmon smolts may be directly released into the river depending on conditions in the river at the time of release (presence of ice at the volitional release site).

## Yankee Fork Broodstock Collection

The Yankee Fork weir would be operated in June through September for Chinook salmon broodstock collection for the Crystal Springs hatchery. The Yankee Fork weir facility would be staffed by two individuals in the May to October period to operate the fish weir, evaluate redd counts and spawning activities and support the evaluations of juveniles in the watershed.

The weir could also be operated in May and June for collection of steelhead broodstock for the Sawtooth Hatchery, if separate funding is available and environmental compliance is completed (collection of steelhead broodstock is not included in the Proposed Action).

### Yankee Fork Adult Outplants

The broodstock selection of Upper Salmon River stocks derived from the Sawtooth Fish Hatchery offer an opportunity to outplant adult, hatchery-origin Chinook into the upper reaches of the Yankee Fork Salmon River for volitional spawning. These outplants of hatchery stocks would only be performed when abundance at the Sawtooth Fish Hatchery exceeds the harvest and broodstock needs from the returning adults annually. The Yankee Fork is currently operating a temporary picket weir to collect returning adults. The Tribes have been performing ongoing genetic evaluations to determine the contribution of these volitionally released adults to the population in Yankee Fork.

### Yankee Fork Other Operations Activity

On a day-to-day basis during active facility operations, two technicians would check the pre-sort holding pool; weigh, measure, and mark hatchery-origin fish; and transfer them to a holding pond based on gender. Natural-origin fish would be returned to the water to spawn volitionally.

The technicians would determine the need for chemical treatments (iodophor) of adult fish based on the presence of fungus or disease. Treatments, when needed, are administered directly into the holding pools.

Annually, the holding pools would be cleaned out thoroughly and flushed with clean water before drying them completely. This work would be performed late in the season, before frost sets in.

The site would have an informational kiosk, located at Pole Flat Campground, describing facility operations for visitors.

## 2.1.3.3 Panther Creek Chinook Salmon

### Panther Creek Broodstock Development

The initial Chinook salmon broodstock for the Panther Creek program would originate from the Pahsimeroi Hatchery on the Pahsimeroi River, north of Challis, Idaho. Pahsimeroi stock is within the same major population group (Upper Salmon spring/summer-run Chinook major population group) as Panther Creek. This facility is operated by IDFG. The program would begin converting to locally adapted broodstock when adult returns (both natural and hatchery) to Panther Creek average 1,000 fish over a 4- to 5-year period. At that time, surplus hatchery adults from outside the subbasin no longer would be stocked into the system unless average run size drops below 250 adults. Approximately 214 adults would be needed for hatchery broodstock to ensure that the goal of releasing 400,000 smolts to Panther Creek is achieved. They would be collected randomly from Panther Creek throughout the entire adult migration period. The weir would be operated between the first week of June and the last week of August, 24 hours per day during this period. Spawned adult carcasses would be returned to the creek as a nutrient source.

The conservation objective is to achieve a minimum natural escapement of 500 adults that would be managed for broodstock. The Tribal harvest objective is to achieve an annual harvest of 800 Chinook salmon adults.

## Panther Creek Chinook Salmon Production

The Chinook salmon hatchery program proposed for Panther Creek would be implemented to accelerate re-colonization of habitat that was destroyed by historical mining activities in the basin. Over time, this habitat has been, and is continuing to be restored with an aggressive and closely monitored habitat improvement program (not funded under the Proposed Action). In Panther Creek, the Tribes have actively protected over 5 miles of Chinook salmon spawning habitat as part of livestock fencing and restoration efforts from 2010 to 2012.

The hatchery program is designed to achieve Tribal conservation, harvest, and cultural goals in Panther Creek. The Tribes' conservation objective is to achieve a local population in Panther Creek. The harvest objective is to achieve an annual harvest rate of 500 Chinook salmon adults in Phase 1 and 800 adults in Phase 2. Though described here in some detail, final hatchery operations would be described in full in the HGMP for the Panther Creek Chinook salmon program, and may be modified slightly during the ESA review and consultation process or through adaptive management.

### Phase 1: Develop Local Broodstock

Phase 1 of the program would focus on developing local Chinook salmon broodstock. An outline of Phase 1 components is provided below:

- Escapement priorities are: (1) hatchery broodstock, and (2) after broodstock needs have been met, Tribal harvest and natural spawning. Specific adult management criteria and adult use priorities would be developed during the future ESA review and consultation process or through adaptive management.
- Initially, up to 200,000 Chinook salmon smolts would be released annually into Panther Creek. Broodstock would be obtained from Pahsimeroi Hatchery, based on the recommendation from NMFS.
- Prior to the construction of hatchery facilities, certified disease-free eyed-eggs from Pahsimeroi Hatchery would be planted in remote egg incubators or egg-boxes spread throughout Panther Creek. When the Crystal Springs hatchery becomes operational, it would produce up to 400,000 smolts for release in Panther Creek. Any continuation of egg-plants following construction of the hatchery would be determined based on information collected by the monitoring and evaluation of stocking success.
- Local broodstock collection (i.e., adults returning to Panther Creek) would be initiated during Phase 1. Broodstock would be collected at the new Panther Creek weir. The broodstock source during this period is expected to transition from Pahsimeroi Hatchery adults to an increasing percentage of adults collected from Panther Creek returns.
- No integrated hatchery program objectives would be applied during this phase. The contribution of straying hatchery-origin fish (all hatchery programs combined) to natural spawning populations outside of Panther Creek would be maintained at less than 5%, per HSRG guidelines (Paquet et al. 2011:551).
- The Tribal harvest rate would be up to 8% of adult returns when the run size is less than 108% of the broodstock target of 214 Chinook salmon. The harvest rate increases when the run size exceeds 108% of the broodstock target. A set of decision rules was developed based on the harvest rates established for the Salmon River subbasin hatchery programs in the Shoshone-Bannock Tribal Resource Management Plan (Shoshone-Bannock Tribes 2010a; see Section

2.4.3) and was approved by NMFS in its Biological Opinion (NMFS 2013) of the Tribal Resource Management Plan (Appendix B ).

**Phase 2: Discontinue Use of Pahsimeroi Hatchery Broodstock and Convert to Locally Adapted Broodstock**

Phase 2 would be triggered when the 5-year running geometric mean return to Panther Creek increases to 1,000 Chinook salmon (hatchery-origin plus natural-origin returning adult). Adult run sizes would be monitored at the Panther Creek weir. Under this phase, local broodstock would be used. Specific adult management criteria and adult use priorities will be developed during the future ESA review and consultation process or through adaptive management. A preliminary description of the Phase 2 program is as follows:

- Escapement priorities are: (1) hatchery broodstock (approximately 214 adults needed to produce 400,000 smolts), and (2) Tribal harvest and natural spawning.
- Collect 358 returning adults for broodstock. Achieve returns of 800 Chinook salmon (natural-origin plus hatchery-origin returning adults) for Tribal harvest and 500 Chinook salmon (natural-origin plus hatchery-origin returning adults) for natural spawning.
- Collect all Panther Creek broodstock at the weir. Collect natural-origin and hatchery-origin returning adults at random over the entire migration run. Jacks would be incorporated into the broodstock at a rate not to exceed 10%, according to the HSRG guidelines (HSRG 2004b).
- No integrated hatchery program objectives would be applied to this phase. The contribution of straying hatchery-origin fish (all hatchery releases combined) to natural spawning populations outside of Panther Creek would be maintained at less than 5% (HSRG 2004a).
- Harvest rates would be managed according to a set of decision rules set out in the Tribal Resource Management Plan (Appendix B) to ensure that broodstock, harvest, and spawning objectives are met, on average, over the long term.
- The program may return to Phase 1 management if adult returns to Panther Creek (natural-origin plus hatchery-origin returning adults) are less than 250 Chinook salmon for two years in a row. A return to Phase 1 management allows for the use of Pahsimeroi Hatchery adults for broodstock.

Program objectives may be revised in the future if a determination is made that an additional viable (Contributing) population is needed to recover the ESU. Such a decision would not affect the implementation of Phase 1 and Phase 2. Consultation with NMFS would be triggered when the 5-year running average (geometric mean) of natural-origin fish escapement in Panther Creek exceeds 750 adults. If and when this number is achieved, the Tribes would request a status review of the Panther Creek population to determine if the Panther Creek program could be converted to an integrated hatchery program designed to achieve criteria for a Contributing population as recommended by the HSRG[6] (HSRG 2004a).

[6] HSRG criteria for hatchery influence on contributing populations: the proportion of effective hatchery-origin spawners should be less than 10% of the naturally spawning population, unless the hatchery population is integrated with the natural population; for integrated populations, the proportion of natural-origin adults in the broodstock should exceed the proportion of effective hatchery-origin spawners, corresponding to a proportionate natural influence value of 0.50 or greater and a proportion of effective hatchery-origin spawners less than 30%.

### Panther Creek Smolt Releases

Approximately 400,000 yearling Chinook salmon smolts produced at the hatchery would be transported to Panther Creek in a fish tanker truck to an acclimation pond for volitional release in the spring. The smolts would be forced out after a minimum of five days of acclimation. On rare occasions, Chinook salmon smolts may be directly released into the river depending on conditions in the river at the time of release (presence of ice at the volitional release site).

### Panther Creek Broodstock Collection

The Panther Creek weir would be operated in June through September for Chinook salmon broodstock collection for the Crystal Springs hatchery. The Panther Creek weir facility would be staffed by two individuals in the May to October period to operate the fish weir, evaluate redd counts and spawning activities and support the evaluations of juveniles in the watershed.

### Panther Creek Adult Outplants

Until the pathogen risk of outplanting adults from an out-of-basin stock are adequately evaluated, all Chinook salmon stocking in Panther Creek would consist of egg outplants and smolt releases.

The Panther Creek weir facility would be staffed by two individuals in the May to October period to operate the weir and acclimation facility.

### Panther Creek Other Operations Activity

On a day-to-day basis during active facility operations, two technicians would check the pre-sort holding pool, weigh, measure, and mark hatchery-origin fish, and transfer them to a holding pond based on gender. Natural-origin fish would be returned to the water to spawn volitionally.

The technicians would determine the need for chemical treatments of hatchery adult fish (formalin) based on the presence of fungus or disease. Treatments, when needed, would be administered directly into the holding pools.

Annually, the holding pools would be cleaned out thoroughly and flushed with clean water before drying them completely. This work would be performed late in the season, before frost sets in.

The site would have an informational kiosk describing facility operations for visitors. The Cobalt District Ranger Station administrative site could safely accommodate tours or visitors away from the roadside on each day of operation, although no such tours are proposed to occur.

## 2.1.3.4 Yellowstone Cutthroat Trout Program

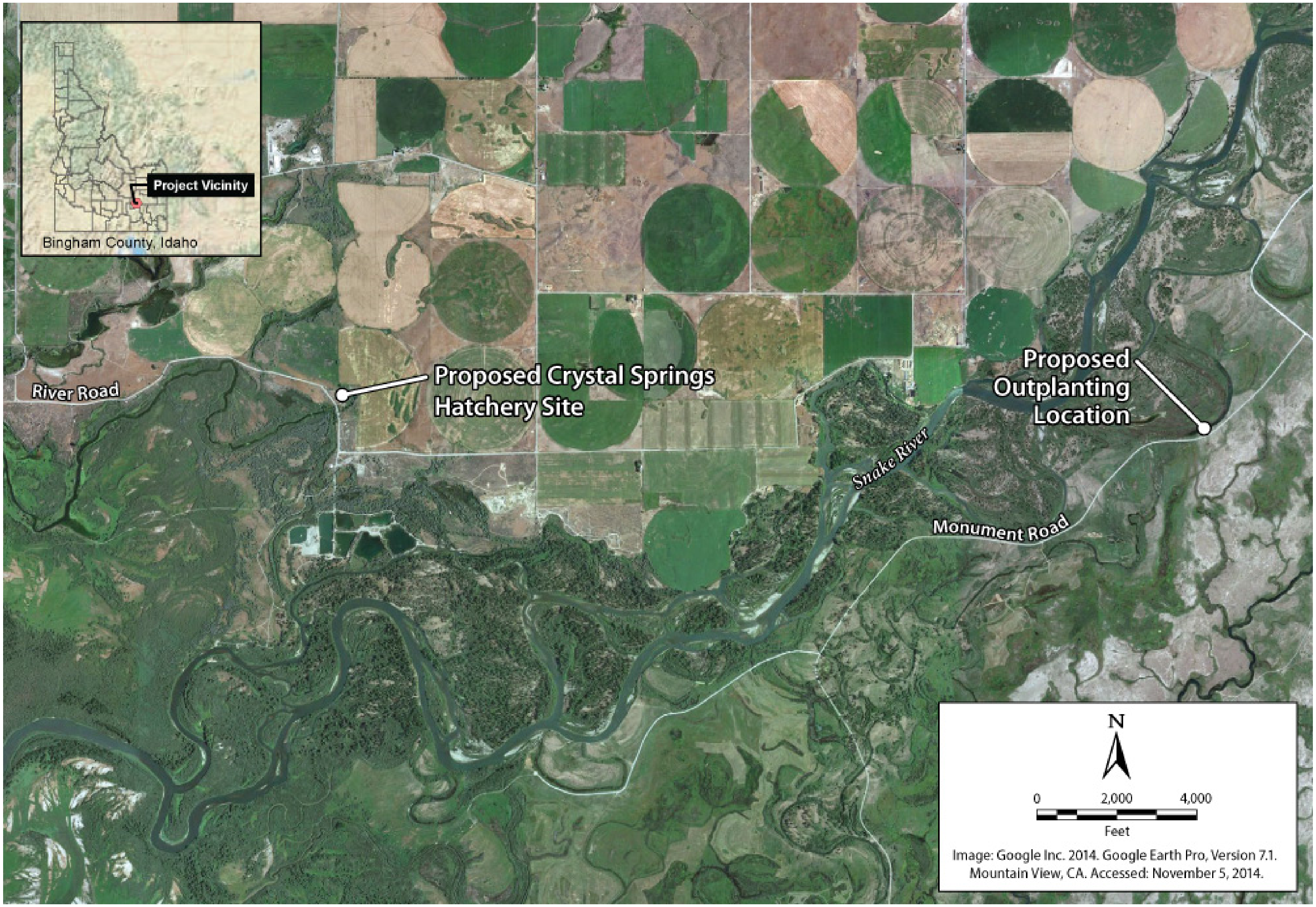
Native populations of Yellowstone cutthroat trout have declined substantially due to habitat degradation and the introduction of non-native salmonids. In 1998, Yellowstone cutthroat trout were petitioned for listing as threatened under the ESA. The U.S. Fish and Wildlife Service (USFWS) determined that subspecies listing was “not warranted” in a 90-day finding (USFWS 2001) and a full status review finding (USFWS 2006). Yellowstone cutthroat trout are listed as a Sensitive Species or Species of Special Concern by the USFS, the American Fisheries Society, and in all states (Idaho, Wyoming, Montana, Utah, and Nevada) that they inhabit. The IDFG has developed a *Management Plan for Conservation of Yellowstone Cutthroat Trout in Idaho* (IDFG 2007). The goal of the plan is to provide a management framework to ensure the long-term persistence of the subspecies at levels capable of providing angling opportunities.

Yellowstone cutthroat trout is a culturally important species to the Tribes, and several self-sustaining populations of this species are found on the Fort Hall Reservation. Habitat restoration and enhancement actions to benefit Yellowstone cutthroat trout have been, and are currently being implemented on the Fort Hall Reservation and on nearby federal, state and private lands (Osborne 2009). A variety of methods are being used to remove non-native salmonids that compete with the Yellowstone cutthroat trout. In addition to these ongoing restoration activities, the Tribes seek to provide more opportunities for Tribal and sport anglers to catch and harvest Yellowstone cutthroat trout without risk to native trout populations. The fishery would be located on the Fort Hall Reservation in an oxbow lake (see description below) that does not contain native trout.

The program would rear up to 5,000 fish too small to catch, 5 to 6 inches long, for release into a spring-fed 16-acre oxbow lake located on the Fort Hall Reservation (Figure 2-10). Surveys indicate that the oxbow is moderately eutrophic (rich in nutrients) and would provide excellent rearing conditions for planted fish. These fish are expected to exhibit fast growth rates and should produce a trophy fishery (larger fish valued by fishers) within one to two years after initial stocking. The lake fishery would complement the existing trophy stream fishery currently in place in the Fort Hall Bottom.

Initial production goals of 5,000 cutthroat may be adjusted up or down depending upon whether project objectives are being met. There are several self-sustaining populations of Yellowstone cutthroat trout on the Fort Hall Reservation that could be used to develop broodstock for the proposed program. Genetic surveys conducted during the 2012 field season are currently being evaluated by the USFWS for their potential use as a broodstock source for the Hatchery Program. The USFWS also operates a Yellowstone cutthroat trout program at the Jackson Lake Fish Hatchery (Wyoming) that could serve as a potential source of viable eggs to start the Hatchery Program. The sources of broodstock would be confirmed prior to initiation of the Yellowstone cutthroat trout program. The program would require between 100 and 200 adults to produce the juvenile release numbers (5,000) identified for the program (fecundity varies widely by fish size and there may be issues with fish health that require a larger broodstock group).

**Figure 2-10. Proposed Yellowstone Cutthroat Trout Outplanting Location**



### 2.1.3.5 Operations: 50% Production of Chinook Salmon Option

A second option has been developed for the Proposed Action that considers a 50% reduced production of Chinook salmon option for both the Yankee Fork weir facility and the Panther Creek weir facility (the Yellowstone cutthroat trout program would not be reduced in size). The Crystal Springs Master Plan considered a reduced production option that would focus on a higher ESA conservation value for recovery in Yankee Fork than what is proposed under the Proposed Action. Modeling of this option suggested that the lower production numbers required would not provide enough returning adults to support both a natural population and hatchery broodstock (Shoshone-Bannock Tribes 2011). Expected changes to the Chinook salmon population associated with the full production and the 50% production options are shown in Table 2-2 and Table 2-3.

The primary purpose for engaging in production actions in both the Yankee Fork and Panther Creek watersheds is to increase abundance to support Tribal treaty harvest. By reducing production by 50%, the number of returning adults would be reduced accordingly. The Tribes would set lower harvest limits through the Tribal Resource Management Plan harvest framework. The 50% production option would, therefore, not support the Tribes' purpose and need to recolonize habitat by increasing the abundance of natural spawners in Yankee Fork and Panther Creek. Further, it would not meet NMFS' purpose and need to ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon because the natural-origin abundance would be reduced by taking broodstock from lower adult returns.

**Table 2-2. Number of adult spring/summer-run Chinook salmon produced in Yankee Fork with and without the proposed Crystal Springs Hatchery Program.**

| | Number of Chinook Adults Without Program | | | Number of Chinook Adults With Program | | | Number of Chinook Adults With 50% Reduction to Program | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameters | Max | Min | Avg | Max | Min | Avg | Max | Min | Avg |
| Natural-origin spawning escapement[1] | 51 | 2 | 9 | 386 | 43 | 104 | 285 | 27 | 74 |
| Hatchery-origin spawning escapement[2] | 45 | 8 | 15 | 1,572 | 273 | 514 | 808 | 140 | 264 |
| Total natural escapement (natural-origin and hatchery-origin) | 95 | 10 | 24 | 1,957 | 324 | 619 | 1,092 | 174 | 338 |
| Total harvest | 61 | 2 | 11 | 3,819 | 644 | 1,224 | 2,020 | 333 | 638 |
| Hatchery broodstock | 0 | 0 | 0 | 358 | 357 | 358 | 179 | 179 | 179 |
| Surplus at hatchery | 0 | 0 | 0 | 893 | 0 | 98 | 447 | 0 | 49 |
| Total run size[3] | 142 | 0 | 21 | 7,012 | 1,303 | 2,284 | 3,724 | 664 | 1,190 |

Notes

[1] Natural production estimate is based on assumed adult productivity and capacity values of 1.45 and 600, respectively. Estimates were taken from the Hatchery Scientific Review Group population report for the Yankee Fork (HSRG 2008b).

[2] The smolt-to-adult survival rate used to model hatchery-origin fish was that observed for the Sawtooth Hatchery spring Chinook program (i.e., 0.29%).

[3] Sawtooth Hatchery strays that enter the Yankee Fork are not removed in calculating total run-size.

**Table 2-3. Number of adult spring/summer-run Chinook salmon produced in Panther Creek with and without the proposed Crystal Springs Hatchery Program.**

| | Number of Chinook Adults Without Program | | | Number of Chinook Adults With Program | | | Number of Chinook Adults With 50% Reduction to Program | | |
|---|---|---|---|---|---|---|---|---|---|
| Parameters | Max | Min | Avg | Max | Min | Avg | Max | Min | Avg |
| Natural-origin spawning escapement[1] | 22 | 1 | 5 | 622 | 65 | 167 | 427 | 41 | 114 |
| Hatchery-origin spawning escapement[2] | 10 | 2 | 3 | 1,151 | 200 | 377 | 580 | 101 | 190 |
| Total natural escapement (natural-origin and hatchery-origin) | 32 | 3 | 8 | 1,773 | 277 | 544 | 1,006 | 149 | 304 |
| Total harvest | 26 | 1 | 6 | 3,257 | 534 | 1,023 | 1,768 | 281 | 548 |
| Hatchery broodstock | 0 | 0 | 0 | 214 | 214 | 214 | 107 | 107 | 107 |
| Surplus at hatchery | 0 | 0 | 0 | 720 | 0 | 99 | 361 | 0 | 50 |
| Total run size[3] | 55 | 1 | 11 | 5,961 | 1,009 | 1,877 | 3,239 | 526 | 1,006 |

Notes

[1] Natural production estimate is based on assumed adult productivity and capacity values of 2.2 and 1,200, respectively. Estimates were taken from the Hatchery Scientific Review Group population report for the Panther Creek (HSRG 2008a).

[2] The smolt-to-adult survival rate used to model hatchery-origin fish was that observed for the MCall Chinook program (i.e., 0.32%).

[3] Strays that enter Panther Creek naturally are not removed in calculating total run-size.

Under the 50% production option, fewer fish would be produced, but most aspects of the Proposed Action would remain unchanged. The Crystal Springs hatchery would be the same size and would have the same water supply; the excess production capacity could be used in the future for expansion of either Chinook salmon or Yellowstone cutthroat trout production, or possibly addition of another program, subject to appropriate legal and regulatory process requirements.

Under the 50% production option, the Yankee Fork and Panther Creek weir facilities would be the same size, would entail the same staffing, and would be operated for the same period of time each year, as under the full production option. The facilities would be the same size because facility size is primarily determined by the size of the stream where the facility is sited. Facility staffing would be the same because, for safety reasons, the Tribes always use at least two personnel to staff an operational fish facility. Two staff would be present during facility operations under either the full production or the 50% production option. The facilities would be operated for the same duration because the genetic makeup of the broodstock must be representative of the genetic makeup of the natural-production fish population. Thus the weir should be in place prior to the beginning of the run and sampling should occur throughout, until the end of the run. Sampling for a reduced period would bias the sampling toward fish with a more limited run timing. Also, staff must be present at all times that the weir is in place to ensure minimal delay in upstream passage by non-target fish such as bull trout. Water volumes diverted at each site would also remain the same, as would amounts of aquaculture treatment chemicals used to treat those diversion volumes.

The following aspects of the program would change under the 50% production option:

- Water demand at the Crystal Spring Hatchery would be less than under the full production option by approximately 12 to 14 cfs. There would be a proportionate reduction in the use of aquaculture treatment chemicals.
- Fewer smolts would be delivered to the Yankee Fork and Panther Creek weir facilities, reducing the number of trips to approximately two trips for each site.
- A smaller program would employ one less full-time aquaculture specialist and fewer temporary technicians at the Crystal Springs hatchery facility.

All hatchery facilities described under the previous two alternatives (Alternatives 1 and 2) would remain intact under the reduced production option. The phases and operations would be the same as described above. The only change, other than what is listed above, would be a reduction in production goals.

## 2.1.4 Monitoring and Evaluation

### 2.1.4.1 Yankee Fork and Panther Creek Monitoring and Evaluation

The proposed monitoring and evaluation for the Chinook salmon programs in the Yankee Fork and Panther Creek would focus on five areas:

1. Determining if program conservation and harvest objectives are being achieved
2. Ensuring that hatchery culture practices meet identified standards
3. Quantifying hatchery fish performance as they migrate to and from the ocean
4. Documenting hatchery-origin adult stray rates to other out-of-basin streams
5. Tracking natural fish population abundance, productivity, life history diversity, and spatial structure

The proposed monitoring program builds upon the monitoring and evaluation work currently being implemented to evaluate the Yankee Fork Chinook Salmon Supplementation Program. The major proposed addition to the Yankee Fork Chinook Salmon Supplementation monitoring and evaluation program is to evaluate harvest levels, hatchery culture practices, hatchery fish performance, and the stray rates of hatchery-origin fish in comparison to other populations in the basin. The overall goal is to determine if program conservation and harvest objectives can be achieved in both Panther Creek and the Yankee Fork.

If the 5-year running average of native-origin Chinook salmon escapement to the Yankee Fork exceeds 750 adults, the Tribes would consult with NMFS to determine if managing Yankee Fork Chinook salmon as a contributing population is needed to meet recovery objectives for the Snake River spring/summer-run Chinook Salmon ESU. With an average run-size of 2,000 natural-origin returning adults, the need for a hatchery program would be reconsidered because run-size would be sufficient to achieve all current conservation, harvest, and cultural objectives. Continuation of the program might be warranted if harvest objectives are updated, particularly for Tribal communal and sport harvest.

### 2.1.4.2 Yellowstone Cutthroat Trout Monitoring and Evaluation

The Yellowstone cutthroat trout program is designed to have a catch goal of 0.5 fish per hour of fishing effort, regardless of size. The oxbow lake that would receive the initial stocking is easily accessible and catch, effort, size, and other attributes of harvested fish would be straightforward to monitor using creel surveys (monitoring the catch of fishers at the lake). In addition, the lake would be monitored for water quality, fish abundance, and fish condition each year to refine stocking densities over time. A monitoring and evaluation plan is presented in the Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011 [see Section 4.6 of the Master Plan]). The Tribes' Step 2 and Step 3 documents for the Council's hatchery evaluation program (see Section 5.4 of the Master Plan) identify program goals and would be used to guide adaptive management of the program to ensure that harvest objectives are being met.

The biological objectives identified for Yellowstone cutthroat trout that would be monitored include the following:

- Ensure collection of an adequate number of Yellowstone cutthroat trout to begin a captive broodstock program to minimize risk of genetic issues, including founder effect (the chance of loss of genetic variation that occurs when a new population is started from a few individuals from a larger population) and in-breeding depression (reduced biological fitness as a result of inbreeding) that can occur when the broodstock population does not have sufficient genetic diversity.
- Ensure use of genetically pure strains of Yellowstone cutthroat trout to produce approximately 5,000 catchable Yellowstone cutthroat trout annually for release into the oxbow lake in Fort Hall Bottoms to achieve harvest objectives and to minimize risk of using fish that have hybridized with other populations, or lack the necessary genetic diversity.
- Hatchery staff would be responsible for monitoring all phases of hatchery production. The key attributes to be monitored are listed below.
    - Number of adults collected for broodstock
    - Sex, age, and fecundity of broodstock
    - Compliance with genetically-based mating protocol
    - Number of fingerlings and catchable yearlings reared and released
    - In-hatchery survival rates by life stage
    - Mark rate for all hatchery releases
    - Compliance with NPDES permit(s)

## 2.1.5 Adaptive Management of the Chinook Salmon Programs

The proposed Chinook salmon programs would use management triggers based on adult abundance to confirm or alter program direction and objectives. If adult returns increase to the identified trigger levels, hatchery production may be reduced or eliminated. The program would thus adapt to the number of adults returning to each targeted subbasin (Table 2-4).

**Table 2-4. Adaptive Management Triggers for the Chinook Salmon Programs**

| Trigger | Rationale | Production Level from Crystal Springs Hatchery |
|---|---|---|
| Phase 1 – Colonization Decision Framework | | |
| *Yankee Fork Salmon River Chinook* | | |
| When the combined NOR and HOR adult run-size to the Yankee Fork exceeds 1,000 adults, the program would begin converting to the use of locally adapted broodstock. | A run size of 1,000 fish indicates that adult abundance is sufficient to allow some fish to be removed for broodstock without seriously affecting natural production and can sustain hatchery production without relying on Sawtooth origin stocks for broodstock. | During Phase 1, the production from Crystal Springs would be targeted to produce up to 600,000 smolts to increase abundance in the Yankee Fork watershed. The trapping facility would maximize broodstock capture from hatchery-origin stocks, but might require some production and use of Sawtooth origin adults. |
| *Panther Creek Chinook* | | |
| When the combined NOR and HOR adult run-size to Panther Creek exceeded 1,000 adults, the program would begin converting to the use of locally adapted broodstock. | A run-size of 1,000 fish indicates that adult abundance is sufficient to allow some fish to be removed for broodstock without seriously affecting natural production. | During Phase 1, the production from Crystal Springs would be targeted to produce up to 400,000 smolts to increase abundance in the Panther Creek watershed. The trapping facility would maximize broodstock capture from hatchery-origin stocks, but might require the use of Pahsimeroi-origin eggs. |
| Phase 2 – Local Adaptation Decision Framework | | |
| *Yankee Fork Salmon River Chinook* | | |
| The program would be managed as a harvest program with an emphasis on natural production above the trapping facility. If the 5-year running average NOR escapement exceeded 750 adults, the program would be evaluated for Phase 3. | The program would be managed to provide harvest objectives using only locally adapted broodstock while maintaining or reducing hatchery influences on natural production above the trapping facility. If fewer than 400 adults return to the weir for two consecutive years then Sawtooth origin broodstock will be used to meet production demands for the program. | During Phase 2, the production from Crystal Springs would remain up to 600,000 smolts, but broodstock would primarily be collected from the Yankee Fork facility. |
| *Panther Creek Chinook* | | |
| The program would be managed | The program would be managed | During Phase 2, the production |

| Trigger | Rationale | Production Level from Crystal Springs Hatchery |
|---|---|---|
| as a harvest program with an emphasis on natural production above the trapping facility. If the 5-year running average NOR escapement exceeded 750 adults, the program would be evaluated for Phase 3. | to provide harvest objectives using only locally adapted broodstock while maintaining or reducing hatchery influences on natural production above the trapping facility. If fewer than 250 adults return to the weir for two consecutive years Pahsimeroi-origin broodstock will be used to meet production demands for the program. | from Crystal Springs would remain up to 400,000 smolts, but broodstock would primarily be collected from the Panther Creek weir facility. |
| Phase 3 – Integrated Harvest Program | | |
| *Yankee Fork Salmon River Chinook* | | |
| The program would be managed as an integrated harvest program with an emphasis on natural production above the trapping facility | If NOR escapement exceeds 750 adults then adequate natural production exists to sustain a genetically diverse population while providing for hatchery-origin fisheries below the trapping facility. | During Phase 3, the production from Crystal Springs would be managed as an integrated harvest program with an emphasis on natural production above the trapping facility. If the 5-year running average NOR escapement exceeds 2,000 adults, the program may be eliminated. |
| *Panther Creek Chinook* | | |
| The program would be managed as an integrated harvest program with an emphasis on natural production above the trapping facility. | If NOR escapement exceeds 750 adults then adequate natural production exists to sustain a genetically diverse population while providing for hatchery-origin fisheries below the trapping facility. | During Phase 3, the production from Crystal Springs would be managed as an integrated harvest program with an emphasis on natural production above the trapping facility. If the 5-year running average NOR escapement exceeds 2,000 adults, the program may be eliminated. |

Notes:
NOR = natural-origin return
HOR = hatchery-origin return

#### 2.1.5.1 Yankee Fork

Juveniles would be released directly to the stream or held in existing ponds constructed by the Tribes next to the stream channel prior to release (Figure 2-7). All fish in each group of hatchery juveniles would be marked by clipping their adipose fin (to visually indicate they are hatchery fish), and up to 5% of all fish in each group would also be marked with coded-wire tags, so that they may be evaluated based on the release strategy (age, size, or acclimation period) as they return as adults. Stream surveys would be used to enumerate the tags and the results used to alter release strategies (i.e., change when or how they were released). To determine the source of the difference in survival rates, a portion (15%) of the juveniles would be tagged with Passive Integrated Transponder tags to monitor adult and juvenile migration and survival through the Federal Columbia River Power System. Tag monitoring can also help identify the number of returning adult Chinook salmon that are collected or detected at weirs and hatcheries wherever tag readers are used. This information can be used to identify problems with migration or mortality specific to individual programs, and can be used to adapt release strategies.

#### 2.1.5.2 Panther Creek

All fish in each group of hatchery juveniles released at the Panther Creek weir site would be marked by clipping their adipose fin (to visually indicate they are hatchery fish), and up to 5% of all fish in each group would also be marked with coded-wire tags, so that they may be evaluated based on the release strategy (age, size, or acclimation period) as they return as adults.

The number and origin of adults returning to Panther Creek would inform the Tribes about what is possible from both conservation and harvest perspectives. For example, if natural-origin returning adult abundance is greater than expected, program focus may shift more to conservation. This may require that the monitoring and evaluation program expand to determine if performance standards critical to the success of a conservation program are being achieved. Broodstock collection strategies would be altered to properly integrate the program, and the number of hatchery fish released may have to be altered to meet performance standards and aid in determining if decision triggers (i.e., meet criteria to move forward into an integrated hatchery program) are reached (Section 2.1.3.3, *Panther Creek Chinook Salmon*).

## 2.2 Alternative 2: Hatchery Program with Temporary Weir Facilities

A second alternative has been developed for this EIS, which is capable of accomplishing the goals for the Hatchery Program. All hatchery facilities described for the Proposed Action (Alternative 1)would remain intact under this alternative, including both the full production and the 50% production of Chinook salmon options. The production goals, phases, and operations would be the same as described above. The only changes from the Proposed Action would be to the adult trapping and holding facilities at Yankee Fork and Panther Creek. Therefore, the description of this alternative presented below focuses on changes to the Yankee Fork and Panther Creek weir facilities as compared to the Proposed Action.

Decommissioning of the hatchery and weir facilities proposed under Alternative 2 is not described in this EIS. Decommissioning of the facilities would occur in the distant future (more than 20 years from now) and is too speculative to describe accurately. Such an action, if and when it occurs, will be subject to a separate evaluation under NEPA to determine its environmental impacts and appropriate mitigation, if required.

### 2.2.1 Yankee Fork Weir Facility

A temporary picket weir would continue to be installed in the Yankee Fork at Pole Flat Campground and be operated by the Tribes to capture adult Chinook salmon returning from approximately June through Mid-September. In addition, a temporary campsite would be designated for Tribal use at Pole Flat Campground during the field season. The program components for the Yankee Fork weir facility are described below.

**Picket Weir.** A temporary picket weir would continue to be installed on the Yankee Fork when flows are beneath 400 cfs and debris flows are not a substantial risk to the structure. Several hundred pickets would be inserted into panel bars to span 60 feet of the Yankee Fork adjacent to Pole Flat Campground. This weir would effectively stop adult Chinook salmon from bypassing the trap. The picket weir would be installed in early June and removed in mid-September after the Tribes have calculated a 99% adult passage rate for Chinook salmon. Figure 2-11 shows what a temporary picket weir would look like at the Yankee Fork weir facility.

**Adult Trap.** A temporary adult trap would be attached to the picket weir. It would be approximately 12 square feet in area, with a recovery area approximately 3 feet by 12 feet for adult Chinook salmon. An angled entrance would allow adult Chinook salmon to enter the trap until they were monitored and removed to the off-site holding area at the East Fork Salmon River facility operated by IDFG.

**Juvenile Acclimation.** Smolts would be released into Pond Series 1, 4, or both (existing ponds near the facility that connect to the Yankee Fork) and would be allowed to volitionally emigrate into the main stem after several days of acclimation.

**Yankee Fork Road Alignment.** Under this alternative, the realignment of Yankee Fork Road would not occur; therefore the existing alignment would be retained.

**East Fork Salmon River Facility.** The East Fork Salmon River facility is an existing facility located approximately 18 miles upstream of the confluence of the East Fork Salmon River with the mainstem Salmon River. This facility has been used for Yankee Fork Chinook salmon adult holding and spawning and may provide back-up holding capabilities for the Hatchery Program under this alternative.

**Figure 2-11. Example of a Temporary Weir Structure Proposed at the Yankee Fork and Panther Creek Weir Facilities under Alternative 2**

## 2.2.2 Panther Creek Weir Facility

On Panther Creek at the USFS Cobalt District Ranger Station, a temporary picket weir would be installed and operated by the Tribes to capture adult Chinook salmon returning from approximately June through mid-September. In addition, a temporary campsite would be designated for Tribal use at the Cobalt District Ranger Station during the field season. The program components for the Panther Creek weir facility under this alternative are described below.

**Picket Weir.** A temporary picket weir would be installed on Panther Creek when flows are less than 200 cfs and debris flows are not a substantial risk to the structure. Several hundred pickets would be inserted into panel bars to span 40 feet of Panther Creek at Cobalt District Ranger Station. This weir would effectively stop adult Chinook salmon from bypassing the trap. The picket weir would be installed in early June and removed in mid-September after the Tribes have calculated a 99% adult passage rate for Chinook salmon. Figure 2-11 shows what a temporary picket weir would look like at the Panther Creek weir facility.

**Adult Trap.** A temporary adult trap would be attached to the picket weir. The trap would be approximately 12 square feet in area, with a recovery area approximately 3 feet by 12 feet for adult Chinook salmon. An angled entrance would allow adult Chinook salmon to enter the trap until they were monitored and removed to an off-site holding area at the East Fork Salmon River facility (described below).

**Juvenile Acclimation.** A temporary acclimation facility would be established as described in the Proposed Action above. The water supply for this facility would be the same as described for the Proposed Action; it would be used to establish a temporary adult holding location with removable fiberglass tanks during the trapping period from June through September.

**East Fork Salmon River Facility.** The East Fork Salmon River facility is located approximately 18 miles upstream of the confluence of the East Fork Salmon River with the main stem of the Salmon River. The East Fork facility has been used for Yankee Fork Chinook salmon adult holding and spawning and may provide back-up holding capabilities for the Hatchery Program under this alternative.

### 2.2.3 Differences and Similarities between Alternative 1 and Alternative 2

Alternative 1 and Alternative 2 are identical with regard to construction and operation of the Crystal Springs hatchery. Tables 2-5 and 2-6 compare Alternative 1 to Alternative 2 for the Yankee Fork and Panther Creek weir facilities. As shown in the tables, timing of activities at the Yankee Fork and Panther Creek weir facilities would be essentially the same under both Alternatives, as would staffing of the facilities. Most other aspects of the facilities differ between the Alternatives.

**Table 2-5. Description of Yankee Fork Weir Facility under Alternative 1 and Alternative 2.**

| Yankee Fork Weir Facility | Alternative 1 | Alternative 2 |
|---|---|---|
| Picket Weir Description | Permanent bridge-supported weir system, with rotating picket panels | Temporary picket weir with picket panels installed manually each year |
| Construction Timing | In-water construction from mid-July through mid-August; upland construction from June through October. | No construction proposed. |
| Operations | | |
| Weir Installation | Picket panels rotated into place under the bridge structure in early June (depending upon river conditions and timing of the Chinook salmon run). Picket panels rotated out of river in early September. | Weir installed approximately early June but timing may vary year-to-year based on safety concerns, flow rates, and debris load in the river. Weir removed mid-September. |
| Weir Maintenance | Picket panels would be cleaned of debris from the bridge daily using hand tools. Large debris would be cleared by rotating the picket panels under the bridge and removing the obstruction with hand tools from the river channel if necessary. | Staff will work from the river channel to clear debris daily from the face of the temporary picket weir. Large debris will be cleared by disassembling the affected pickets and removing the obstruction with hand tools from the river channel. |
| Staffing | Two staff. Staff are located off the river channel and primarily work near the adult holding ponds to perform fish handling and to evaluate weir performance and presence of target and non-target species. | Two staff. Staff are located in the river channel and primarily work in the temporary trap box to perform fish handling. |
| Adult Trap | Fish ladder access into permanent adult holding ponds for sorting and collecting broodstock. | Temporary picket trap box, in the stream channel, installed with the temporary picket weir each year. Adult fish are collected and sorted daily directly from the temporary trap box. |

| Yankee Fork Weir Facility | Alternative 1 | Alternative 2 |
|---|---|---|
| Adult Holding/Spawning | Adults are sorted daily and held on-site in permanent adult holding ponds until spawning commences. Natural-origin fish are immediately passed upstream of the fish weir. | Adults are collected from the temporary trap daily, sorted, and transported to the East Fork Salmon River facility. Natural-origin fish are immediately passed upstream of the fish weir. |
| Juvenile Acclimation | Occurs in existing ponds at the site from the last week in March through the second week in April (although times could vary slightly by one week depending on annual weather patterns). | Occurs in existing ponds at the site from the last week in March through the second week in April (although times could vary slightly by one week depending on annual weather patterns). |
| Yankee Fork Road Realignment/Accessibility | Approximately 425 feet of existing paved road would be removed and a new 675-foot section of road would be constructed east of current roadway. Three new access points (one to weir facility, one to public parking area, and one to Pole Flat Campground) would be created. Speed limit would be reduced from 35miles per hour (mph) to 20 mph. | Road realignment activities would not occur; new access points would not be constructed, and 35 mph speed limit would be retained. |
| Use of Therapeutic Chemicals | At both Yankee Fork and Panther Creek, therapeutic chemicals could be used consistent with EPA (2006) regulations. | No therapeutic chemicals would be used. |
| 50% Production of Chinook Salmon Option | Same as described above, except approximately 50% fewer smolts would be delivered to the Yankee Fork and Panther Creek weir facilities. | Same as described above, except approximately 50% fewer smolts would be delivered to the Yankee Fork and Panther Creek weir facilities. |

**Table 2-6. Description of Panther Creek Weir Facility under Alternative 1 and Alternative 2**

| Panther Creek Weir Facility | Alternative 1 | Alternative 2 |
|---|---|---|
| Picket Weir Description | Permanent bridge-supported weir system, with rotating picket panels | Temporary picket weir with picket panels installed manually each year |
| Construction Timing | In-water construction from mid-July through mid-August; upland construction from June through October. | No construction proposed. |
| Accessibility | Construction of the proposed facilities would take place along Panther Creek road in the summer during the weekdays. | No construction proposed as the temporary weir would be installed by hand during early June. |
| Operations | | |
| Weir Installation | Picket panels rotated into place under the bridge structure in early June (depending upon river conditions and timing of the Chinook salmon run). Picket panels rotated out of river in early September. | Weir installed approximately early June but timing may vary year-to-year based on safety concerns, flow rates, and debris load in the river. Weir removed mid-September. |
| Staffing | Two staff. Staff are located off the river channel and primarily work near the adult holding ponds to perform fish handling and to evaluate weir performance and presence of target and non-target species. | Two staff. Staff are located in the river channel and primarily work in the temporary trap box to perform fish handling. |
| Adult Trap | Fish ladder access into permanent adult holding ponds for sorting and collecting broodstock. | Temporary picket trap box, in the stream channel, installed with the temporary picket weir each year. Adult fish are collected and sorted daily directly from the temporary trap box. |
| Adult Holding/Spawning | Adults are sorted daily and held on site in permanent adult holding ponds until spawning commences. Natural-origin fish are immediately passed upstream of the fish weir. | Adults are collected from the temporary trap daily, sorted, and transported to the East Fork Salmon River facility |
| Juvenile Acclimation | Occurs at the Cobalt District Ranger Station administrative site in removable fiberglass tanks from the last week in March through the second week in April (although times could vary slightly by one week depending on annual weather patterns). | Occurs at the Cobalt District Ranger Station administrative site in removable fiberglass tanks from the last week in March through the second week in April (although times could vary slightly by one week depending on annual weather patterns). |
| Use of Therapeutic Chemicals | At both Yankee Fork and Panther Creek, therapeutic chemicals could be used consistent with EPA (2006) regulations. | No therapeutic chemicals would be used. |
| 50% Production of Chinook Salmon Option | Same as described above, except approximately 50% fewer smolts would be delivered to the Yankee Fork and Panther Creek weir facilities. | Same as described above, except approximately 50% fewer smolts would be delivered to the Yankee Fork and Panther Creek weir facilities. |

# 2.3 No Action Alternative

Under the No Action Alternative for the project, BPA would not fund the proposed program including the construction of the hatchery and weir facilities. The Crystal Springs program would not produce Chinook salmon smolts for the Yankee Fork Salmon River or Panther Creek, or produce Yellowstone cutthroat trout for release within the boundaries of the Fort Hall Reservation. No new construction would take place on USFS land within the Panther Creek watershed in connection with the Hatchery Program. On-going actions at the temporary satellite facility on the Yankee Fork Salmon River would continue to operate under the existing authorization through 2016. USFS has temporarily allowed for continued operation in 2017while this EIS is in process. Under the No Action alternative, the Tribes would seek an alternative location for operation or re-submit a Special Use Permit application to USFS. Current Chinook salmon production not associated with the proposed Hatchery Program would continue through separate Tribal programs as funding or excess stock is available for release of hatchery fish to the Yankee Fork Salmon River or Panther Creek.

# 2.4 Options Considered in the Crystal Springs Master Plan

The Crystal Springs Master Plan, prepared by the Tribes in 2011, considered a number of options for the Yankee Fork and the Panther Creek Chinook salmon programs (see Crystal Springs Master Plan pages 50-56 in Volume 1; Shoshone-Bannock Tribes 2011). The options included 800,000 annual juvenile releases into the Yankee Fork; an adult outplant program and smolt program that would eventually transition into a local smolt program (releasing smolts where adult collection would occur); an alternate Yankee weir location; 94,000 annual juvenile releases into Panther Creek; and a program that didn't rely on hatchery fish. These options were eliminated through the Crystal Springs Master Plan process and were therefore eliminated from detailed evaluation in this EIS.

# 2.5 Alternatives Considered but Eliminated from Detailed Study in this EIS

## 2.5.1 Alternatives Proposed During Scoping

During the EIS public scoping process, a commenter recommended production of 10,000 Yellowstone cutthroat trout at the new hatchery for release in the Fort Hall Bottoms (a wetlands area popular with fishermen) rather than the proposed 5,000. This alternative was considered but not pursued in this EIS because it would exceed the stocking capacity of the oxbow lake that is desired to produce the size of fish sought for this program. Studies by the Tribes indicated a stocking density of 5,000 fish would be optimum for this rearing location.

## 2.5.2 Other Alternatives Considered

The Tribes could have proposed to use alternate sources for broodstock for the Yankee Fork or Panther Creek programs to either increase production in the short-term or to mimic the fish that are naturally returning to these areas. Though other spring Chinook salmon hatchery programs may have surplus fish that could be used for these program, they would be non-native to this area and, thus, inconsistent with NMFS' purpose and need to support the Snake River spring/summer-run Chinook Salmon ESU for the purposes of recovery of the ESA-listed species.

Alternatively, the Tribes could have proposed to use only fish that are currently returning to Yankee Fork and Panther Creek. As noted in Section 2.1, *Alternative 1: Hatchery Program with Permanent Weir Facilities*, because natural-origin returns to these areas are so low (less than 50 fish annually), taking fish out of these low populations for broodstock would not leave enough natural-origin fish for spawning. Therefore, this would not support the Tribes' objective to recolonize habitat by increasing the abundance of natural spawners in the Yankee Fork and Panther Creek. The Tribes had contacted NMFS prior to developing these programs to determine what broodstock would be suitable for use in these areas to support recovery of ESA-listed Snake River spring/summer-run Chinook salmon, and selected broodstock for these programs based on those discussions. As a result, both of these alternatives were eliminated from detailed study in the EIS.

# 2.6 Comparison of Alternatives in this EIS

Table 2-7 compares how well Alternative 1 (Proposed Action), Alternative 2, and the No Action Alternative meet BPA's purposes as listed in Chapter 1, Section 1.3, *Purposes for Action*. For Alternative 1 and Alternative 2, Table 2-7 also describes how each alternative meets the purposes with full production of Chinook salmon and with only 50% production of Chinook salmon.

**Table 2-7. Comparison of Alternatives by Purposes**

| Purpose | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| Purposes Identified by Bonneville Power Administration | | | |
| Support efforts to mitigate for effects of the development and operation of the Federal Columbia River Power System on fish and wildlife in the Columbia River and its tributaries, including the Snake River, under the Pacific Northwest Electric Power Planning and Conservation Act of 1980. | ***Full Production:*** Funding provided by BPA for the proposed Crystal Springs Hatchery Program would support mitigation efforts to improve spring/summer-run Chinook salmon runs in the Yankee Fork and Panther Creek. BPA funding would also support Yellowstone cutthroat trout release within the Fort Hall Reservation.<br><br>***50% Production Option:*** The Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011) determined an appropriate level of production based on attributes of the biological system in the Salmon River basin. Producing 50% fewer Chinook salmon would result in reduced mitigation effectiveness, fewer fish to sustain natural production, as well as fewer fish for the Tribes to harvest. | ***Full Production:*** Funding provided by BPA for the proposed Crystal Springs Hatchery Program would support mitigation efforts to improve spring/summer-run Chinook salmon runs in the Yankee Fork and Panther Creek. BPA funding would also support Yellowstone cutthroat trout release within the Fort Hall Reservation.<br><br>***50% Production Option:*** The Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011) determined an appropriate level of production based on attributes of the biological system in the Salmon River basin. Producing 50% fewer Chinook salmon would result in reduced mitigation effectiveness, fewer fish to sustain natural production, as well as fewer fish for the Tribes to harvest. | Funding would not be provided by BPA; therefore, mitigation efforts to improve spring/summer-run Chinook salmon runs and Yellowstone cutthroat trout would not be supported or implemented. Ongoing production actions funded by BPA at Yankee Fork would cease. Current Chinook salmon production not associated with the proposed Crystal Springs Hatchery Program would continue through separate Tribal programs to the extent that authorizations and funding may support release of hatchery fish to the Yankee Fork or Panther Creek. |
| Assist in carrying out commitments related to proposed hatchery actions stated in the 2008 Columbia Basin Fish Accords Memorandum of Agreement between BPA and the Tribes. | ***Full Production:*** The Columbia Basin Fish Accords identify the Crystal Springs hatchery for funding. BPA funding for the proposed Crystal Springs Hatchery Program would meet the commitment made to the Tribes in the Memorandum of Agreement. | ***Full Production:*** The Columbia Basin Fish Accords identify the Crystal Springs hatchery for funding. BPA funding for the proposed Crystal Springs Hatchery Program would meet the commitment made to the Tribes in the Memorandum of Agreement. | Funding would not be provided by BPA; therefore, the commitment made to the Tribes in the Columbia Basin Fish Accords Memorandum of Agreement would not be met. |

| Purpose | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| | ***50% Production Option:*** The 50% production option would still provide mitigation obligations detailed in the Fish Accord, but would not meet the conceptual framework approved in the Crystal Springs Master Plan. | ***50% Production Option:*** The 50% production option would still provide mitigation obligations detailed in the Fish Accord, but would not meet the conceptual framework approved in the Crystal Springs Master Plan. | |
| Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction which calls for protecting weak stocks, like the Snake River spring/summer-run Chinook salmon, while sustaining overall populations of fish for their economic and cultural value. | ***Full Production:*** Snake River spring/summer-run Chinook salmon would be protected by producing up to 1 million spring/summer-run Chinook salmon smolts for release in Yankee Fork (up to 600,000) and Panther Creek (up to 400,000).<br><br>***50% Production Option:*** Reduced production of Chinook salmon would not increase abundance of spring/summer-run Chinook salmon to thresholds where the run provides adequate harvest and cultural values for each watershed. | ***Full Production:*** Snake River spring/summer-run Chinook salmon would be protected by producing up to 1 million spring/summer-run Chinook salmon smolts for release in Yankee Fork (up to 600,000) and Panther Creek (up to 400,000).<br><br>***50% Production Option:*** Reduced production of Chinook salmon would not increase abundance of spring/summer-run Chinook salmon to thresholds where the run provides adequate harvest and cultural values for each watershed. | Weak stocks of Snake River spring/summer-run Chinook salmon would not receive any additional protection through BPA. |
| Minimize harm to natural and human resources, including species listed under the ESA. | ***Full Production/50% Production Option:*** Under both full production of Chinook salmon and the 50% production option, facility designs and mitigation measures would minimize harm to natural and human resources, including ESA-listed species. | ***Full Production/50% Production Option:*** Under both full production of Chinook salmon and the 50% production option, facility designs and mitigation measures would minimize harm to natural and human resources, including ESA-listed species. | No construction impacts would occur; harm to natural and human resources, including ESA-listed species, would not occur. |

| Purpose | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| Purposes Identified by Shoshone-Bannock Tribes | | | |
| Increase terminal harvest opportunities for Tribal members in the Yankee Fork and Panther Creek | ***Full Production:*** Terminal harvest opportunities are governed by the Tribal Resource Management Plan to reduce harvest impacts on natural-origin stocks. Under full production, hatchery-origin stocks would be provided consistent with the objectives of the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011), thereby reducing overall impact rates to natural-origin stocks.<br>***50% Production Option:*** Terminal harvest opportunities would improve, but not to the extent intended under the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011). | ***Full Production:*** Terminal harvest opportunities are governed by the Tribal Resource Management Plan to reduce harvest impacts on natural-origin stocks. Under full production, hatchery-origin stocks would be provided consistent with the objectives of the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011), thereby reducing overall impact rates to natural-origin stocks.<br>***50% Production Option:*** Terminal harvest opportunities would improve, but not to the extent intended under the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011). | Terminal harvest opportunities would not increase. Tribal harvest would continue to make an extremely small contribution to Tribal member diets. |
| Ensure Tribal members have the opportunity to harvest Chinook salmon using both traditional hunting methods and contemporary methods | ***Full Production:*** Tribal members would achieve harvest opportunities consistent with the Tribes' intent in undertaking the proposed program.<br>***50% Production Option:*** Tribal members would achieve improved harvest opportunities, but not to the extent envisioned by the Tribes in undertaking the proposed program. | ***Full Production:*** Tribal members would achieve harvest opportunities consistent with the Tribes' intent in undertaking the proposed program.<br>***50% Production Option:*** Tribal members would achieve improved harvest opportunities, but not to the extent envisioned by the Tribes in undertaking the proposed program. | Harvest opportunities would not increase, and would remain very limited. |
| Produce the fish required to achieve the Hatchery Program's defined purpose (i.e., harvest) on a long-term sustainable basis | ***Full Production:*** Fish production would improve consistent with the objectives of the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011), with long-term, sustainable harvest re-established in both the Yankee | ***Full Production:*** Fish production would improve consistent with the objectives of the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011), with long-term, sustainable harvest re-established in both the Yankee | There would be no hatchery program. None of the program purposes would be achieved. |

| Purpose | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| | Fork and Panther Creek.<br>***50% Production Option:*** Fish production would improve, but not to the extent envisioned in the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011). Long-term benefits are less certain. | Fork and Panther Creek. However, logistical challenges of seasonally installing/removing the Yankee Fork and Panther Creek weir facilities would substantially increase.<br>***50% Production Option:*** Fish production would improve, but not to the extent envisioned in the Phase 2 Crystal Springs Master Plan (Shoshone-Bannock Tribes 2011). Long-term benefits are less certain. Logistical challenges of seasonally installing/removing the Yankee Fork and Panther Creek weir facilities would substantially increase | |
| Reduce risks (e.g., from straying) to other populations associated with the evolutionarily significant unit and increase natural-origin Chinook salmon abundance in two additional streams (i.e., Yankee Fork and Panther Creek) | ***Full Production and 50% Production Option:*** Establishment of a locally adapted stock would reduce straying and would increase natural-origin production in both Yankee Fork and Panther Creek. The adult trapping facilities will provide an opportunity to assess genetic risks from straying. | ***Full Production and 50% Production Option:*** Establishment of a locally adapted stock would reduce straying and would increase natural-origin production in both Yankee Fork and Panther Creek. The adult trapping facilities will provide an opportunity to assess genetic risks from straying. | In the absence of the Crystal Springs Hatchery Program, abundance of natural-origin stocks will remain static and the genetic risk to nearby populations will remain unevaluated in Panther Creek. It is likely evaluations would continue in Yankee Fork through the Lower Snake River Compensation Program for Chinook salmon. |
| Purposes Identified by U.S. Forest Service | | | |
| Ensure any special use permit issued is consistent with the Salmon-Challis National Forest plans. | ***Full Production/50% Production Option:*** Under both full production of Chinook salmon and the 50% production option, the Crystal Springs Hatchery Program would be consistent with Salmon-Challis National Forest plans. | ***Full Production/50% Production Option:*** Under both full production of Chinook salmon and the 50% production option, the Crystal Springs Hatchery Program would be consistent with Salmon-Challis National Forest plans. | In the absence of the Crystal Springs Hatchery Program, there would be no need for a special use permit from the U.S. Forest Service. |

| Purpose | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| Purposes Identified by National Marine Fisheries Service | | | |
| Ensure the Proposed Action does not jeopardize the continued existence of ESA-listed Chinook salmon or steelhead or result in destruction or adverse modification of designated critical habitat. | ***Full Production:*** Facility designs and mitigation measures developed during the ESA consultation for Alternative 1 would minimize harm to ESA-listed Chinook salmon and steelhead, and would also minimize adverse effects on designated critical habitat. Permanent infrastructure would result in additional construction impact, but would increase effective management of the natural and hatchery population and increase management flexibility.<br><br>***50% Production Option:*** Facility designs and mitigation measures would be the same as in the full production alternative; however, under the 50% production alternative, fewer adult returns would be available to support brood-localization or gene flow management flexibility. | ***Full Production:*** Facility designs and mitigation measures developed during the ESA consultation for Alternative 2 would minimize harm to ESA-listed Chinook salmon and steelhead, and would also minimize adverse effects on designated critical habitat. Temporary infrastructure would have less construction impact, but would be less effective at effective management of the natural and hatchery population which may limit management flexibility.<br><br>***50% Production Option:*** Facility designs and mitigation measures would be the same as in the full production alternative; however, under the 50% production alternative, fewer adult returns would be available to support brood localization or gene flow management flexibility. | No construction impacts would occur under the No Action Alternative; therefore, ESA-listed Chinook salmon and steelhead and designated critical habitat would not be adversely affected |
| Ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon by conserving its productivity, abundance, diversity, and distribution. | ***Full Production:*** The Crystal Springs Hatchery Program would help localize a broodsource that would increase abundance and supplement natural-origin fish. Permanent infrastructure would allow management of the entire run to allow flexibility to control diversity and distribution of hatchery-origin fish. Productivity would be monitored to ensure the | ***Full Production:*** The Crystal Springs Hatchery Program would help localize a broodsource that would increase abundance and supplement natural-origin fish. Temporary infrastructure may not support management of the entire run annually to allow flexibility to control diversity and distribution of hatchery-origin fish. Productivity would be monitored | The Crystal Springs Hatchery Program would not be implemented, and would not help to ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon. |

| Purpose | Alternative 1 | Alternative 2 | No Action Alternative |
|---|---|---|---|
| | sustainability and recovery of Snake River spring/summer-run Chinook salmon while producing up to 1 million spring/ summer Chinook salmon smolts for release in Yankee Fork (up to 600,000) and Panther Creek (up to 400,000).<br><br>***50% Production Option:*** Permanent infrastructure would allow additional management flexibility to control diversity and distribution of hatchery-origin fish; however, fewer juvenile salmon would be produced, resulting in fewer adult returns and less flexibility in brood-localization or gene flow management. | to ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon while producing up to 1 million spring/ summer Chinook salmon smolts for release in Yankee Fork (up to 600,000) and Panther Creek (up to 400,000).<br><br>***50% Production Option:*** Temporary infrastructure would decrease management flexibility to control diversity and distribution of hatchery-origin fish. Because fewer juvenile salmon would be produced, resulting in fewer adult returns, the temporary infrastructure would allow less flexibility in brood-localization or gene flow management. | |

Notes:
BPA = Bonneville Power Administration; ESA = Endangered Species Act; Tribes = Shoshone-Bannock Tribes.

# 2.7 Summary of Environmental Effects

Table 2-8 summarizes the environmental effects of Alternative 1 (Proposed Action), Alternative 2, and the No Action Alternative that are discussed in detail in Chapter 3, *Affected Environment and Environmental Consequences*, of this EIS.

# 2.8 Mitigation Measures

Table 2-9 lists mitigation measures that have been identified to avoid or minimize potential impacts of the Proposed Action. Based on BPA's previous experience with hatcheries, BPA has determined that the following mitigation measures effectively avoid and minimize project impacts. These mitigation measures are also presented under each respective environmental resource in Chapter 3, *Affected Environment and Environmental Consequences*, of this EIS.

**Table 2-8. Summary of Environmental Project Impacts for the Crystal Springs Hatchery Program**

| | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| Impact | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| Section 3.1, Land Use and Recreation | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Changes in Land Use and Recreational Use | ***Crystal Springs Hatchery:***<br>There would be ***no adverse impacts*** on land use and recreation, and long-term ***low*** beneficial recreational impact due to the increase in interpretive recreation at the new visitor viewing area, enhanced Yellowstone cutthroat trout fishery in Fort Hall Bottoms, and increased opportunity for Upper Salmon basin anglers. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>New facilities construction at Yankee Fork would be a ***low*** land use impact, approved and conditioned by a USFS special use permit. Construction would have a ***moderate*** impact on recreational use of Pole Flat Campground at the Yankee Fork site, which would be mitigated per USFS direction. Construction would have an impact on kayakers (***moderate*** impact at Yankee Fork, ***low*** impact at Panther Creek), as any kayakers running the river would be required to portage around the construction site. Construction at the Panther Creek site would entail closing the Panther Creek road for several weeks during the peak recreational season in order to install a water line, which would be a ***moderate*** impact on recreational users.<br>Operation of the Crystal Springs Hatchery Program would have a ***low*** beneficial recreational impact on recreation as the program would increase Chinook salmon recreational fishing opportunities and provide interpretive information for recreation users. Operation would also have an impact on kayakers (***moderate*** impact at Yankee Fork, ***low*** impact at Panther Creek), as any kayakers running the river would be required to portage | ***Yankee Fork and Panther Creek:***<br>Same as full production, except the beneficial impacts on the Chinook salmon recreational fishery would be somewhat reduced, resulting in a ***low*** beneficial impact. | ***Yankee Fork and Panther Creek:***<br>Because no construction is proposed, there would be ***no land use impacts*** and no construction impacts on recreational uses.<br>There would be operational impacts on recreation (***moderate*** impact at Yankee Fork, ***low*** impact at Panther Creek), primarily by requiring kayakers to portage around the temporary weirs during operation. Operation of the Crystal Springs Hatchery Program would have a ***low*** beneficial impact on the Chinook salmon recreational fishery. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 2, full production, except the beneficial impacts on the Chinook salmon recreational fishery would be somewhat reduced, resulting in a **low** beneficial impact. | ***Yankee Fork and Panther Creek:***<br>No impacts. |

| Impact | Alternative 1 Full Production | Alternative 1 50% Production | Alternative 2 Full Production | Alternative 2 50% Production | No Action Alternative |
|---|---|---|---|---|---|
| | around the weirs. | | | | |
| Wild and Scenic Rivers: Free-Flowing Character and Recreational ORV | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork and Panther Creek, the proposed weir facilities would be consistent with the free flowing character for rivers proposed under the Recreation outstandingly remarkable value (ORV). The proposed structures, however, would create a ***low*** localized impact on recreational use. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1, except the proposed temporary weir facilities would be in the stream channel for only part of the year, and being temporary, would not affect potential for Yankee Fork's and Panther Creek's future designation as a Wild and Scenic River. The temporary weir facilities, however, would be in place during the time of the year when the streams are most likely to receive recreational use and, therefore, would create a ***low*** localized impact on recreation. | ***Yankee Fork and Panther Creek:*** Same as full production | ***Yankee Fork and Panther Creek:*** No changes. |
| Section 3.2, Transportation | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork:*** Low; ***Panther Creek:*** High | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork:*** Low; ***Panther Creek:*** High | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Alteration of Road Safety, Capacity, and Accessibility | ***Crystal Springs Hatchery:*** Construction could cause delays when trucks enter and leave the site, which would be minimized by posting flaggers and considered a ***low*** impact. All other construction and operations impacts would be ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork, construction of the proposed facilities would entail short traffic delays, which is considered a ***low*** impact. At Panther Creek, construction of the proposed facilities would entail moderate traffic delays, with no reasonable detour alternative. Although mitigation (i.e., appropriate signage), would be implemented, this is considered a ***high*** impact. Proposed work would maintain or improve operational road safety at the Yankee Fork site (a ***low*** beneficial impact), and would maintain operational road safety at the Panther Creek site (a ***low*** impact). All other construction and operations impacts would be ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no construction impacts*** on transportation. Operations impacts would be ***low***, needing no mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 Full Production | Alternative 1 50% Production | Alternative 2 Full Production | Alternative 2 50% Production | No Action Alternative |
|---|---|---|---|---|---|
| Section 3.3, Geology and Soils | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects on Geology and Soils in Terrestrial Settings: Seismic Risk, Slope Instability, Soil Settlement, and Soil Depletion or Erosion | ***Crystal Springs Hatchery:***<br>Project design measures would be implemented to minimize risks of seismic impacts, soils settlement, and soil depletion to ***low*** levels. New site infrastructure, however, could concentrate flows that could have a ***low*** impact on soil erosion. The site has no potential for slope instability. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Project design measures would be implemented to minimize risks of seismic impacts, soils settlement, and soil depletion to ***low*** levels. The site has no potential for slope instability. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Due to the absence of permanent structures, the impact potential on geology and soils is ***low***. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Effects on Geology and Soils in Fluvial Settings: Channel Migration, Sedimentation, Channel Scour | ***Crystal Springs Hatchery:***<br>The site has no potential for fluvial impacts. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Project design measures would be implemented to minimize risk of sedimentation and channel scour to ***low*** levels. The sites have a ***low*** potential for channel migration. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Due to the absence of permanent structures, the impact potential on geology and soil is ***low***. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Wild and Scenic Rivers: Geology ORV | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. | ***Crystal Springs Hatchery:***<br>Not applicable. |
| | ***Yankee Fork and Panther Creek:***<br>Construction and operation at the Yankee Fork and Panther Creek sites would have a ***low*** impact on the streams' Geology ORV. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Section 3.4, Vegetation | | | | | |
| Overall Potential Impact | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Facility Construction on Vegetation | ***Crystal Springs Hatchery:***<br>***Low*** impacts due to the loss of low-value vegetation types would be minimized by implementing project design measures and by replanting and restoration in temporarily disturbed areas. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>***Low*** impacts due to the loss of primarily low-value vegetation types | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Due to absence of clearing and grading activity, construction impact potential | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | would be minimized by implementing project design measures and by replanting and restoration in temporarily disturbed areas. | | would be ***low***. | | |
| Effects of Facility Operations on Vegetation | ***Crystal Springs Hatchery:*** ***Low*** impacts would be minimized by monitoring and control of noxious weeds. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** ***Low*** impacts would be minimized by implementing USFS-required general weed prevention practices. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.5, Groundwater and Surface Water Quality and Quantity | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low ***Yankee Fork and Panther Creek:*** Low |
| Effects of Construction on Surface and Groundwater Quality | ***Crystal Springs Hatchery:*** ***Low*** increases in turbidity could occur following rainfall events. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** ***Low*** increases in turbidity would occur during in-channel work. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Facility Discharges on Nutrient Levels in Basin Waters and Disposal of Carcasses | ***Crystal Springs Hatchery:*** The hatchery discharge would contain ***low*** concentrations of nutrients derived from fish waste and excess feed. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** At Panther Creek, the feeding of smolts would cause very ***low*** discharges of nutrients. Smolts would not be fed at Yankee Fork. After spawning, the carcasses of the adult salmon would be distributed upstream of the weirs. Marine-derived nutrients from fish carcasses would provide a ***low to moderate*** beneficial impact in Yankee Fork and Panther Creek. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Contaminants in Hatchery Discharges on River Water Quality | ***Crystal Springs Hatchery:*** Hatchery effluent would sometimes contain therapeutic chemicals at very ***low*** concentrations. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** Adult holding pond effluent would sometimes contain therapeutic chemicals at very ***low*** concentrations. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| Effects on Water Quality of Stormwater Runoff | ***Crystal Springs Hatchery:*** Construction limits would be delineated within 200 feet of streams, other water bodies and wetlands; BMPs would be implemented to control erosion and stormwater and to eliminate discharge into waterways and wetlands; therefore impacts would be ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** Construction limits would be delineated within 200 feet of streams, other water bodies and wetlands; BMPs would be implemented to control erosion and stormwater and to eliminate discharge into waterways and wetlands; therefore impacts would be ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Surface Water Withdrawals on Surface Water Quantity | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** There would be no consumptive use, but some ***low***, localized impacts on surface water flow in the diverted reaches. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Water Withdrawals on Groundwater Supply | ***Crystal Springs Hatchery:*** ***Low***, localized withdrawals of groundwater from the East Snake Plain Aquifer would occur, under an existing water right. This impact is considered ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Wild and Scenic Rivers: Free-Flowing Character | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork, construction impacts on the stream's free-flowing character would be ***low*** due to the implementation of applicable mitigation measures; there would be no operational impacts at the Yankee Fork facility.<br>At Panther Creek, construction impacts on the stream's free-flowing character would be ***low*** due to the implementation of applicable mitigation measures; however, the | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | non-consumptive diversion of water from a short section of stream channel would be considered a ***moderate*** impact. | | | | |
| Section 3.6, Wetlands and Floodplains | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Facility Construction on Wetlands and Floodplains | ***Crystal Springs Hatchery:***<br>Project design measures would minimize wetland fill (0.002 acre), which is considered a ***low*** impact. Best management practices would be implemented to minimize potential impacts on water quality in wetlands, a ***low*** impact. The site has no floodplains. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Due to the small area affected and the use of remediation measures, permanent construction impacts on wetlands would be ***low***. Channel diversion and dewatering at the weir sites would cause a ***moderate***, temporary impact, minimized by timing and revegetation of the affected area. Best management practices would be implemented to minimize potential impacts on water quality in surface waters, a ***low*** impact. The placement of permanent weir structures in the floodplain would have an overall ***low*** impact on flood flows. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Because of the absence of permanent structures, construction impacts on wetlands and floodplains would be ***low***. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Effects of Facility Operation on Wetlands and Floodplains | ***Crystal Springs Hatchery:***<br>Facility groundwater pumping and discharge of facility stormwater would pose a ***low to no*** impact on wetlands. The site has no floodplains. | ***Crystal Springs Hatchery:***<br>Same as full production. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>At the Yankee Fork and Panther Creek sites, there would be a ***low*** impact potential from stormwater runoff into surface waters. There would also be a ***low*** impact potential on floodplains, since structures would not be in-water during seasonal peak flows. | ***Yankee Fork and Panther Creek:***<br>Same as full production. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>Same as Alternative 1. | ***Yankee Fork and Panther Creek:***<br>No impacts. |
| Section 3.7, Fish | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| Construction and Maintenance Effects on ESA-Listed and Other Fish | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Diversion of water to isolate in-channel work areas, occurring only during in-water construction windows for protection of salmonids, would cause a ***low***, temporary impact.<br><br>Handling of fish caught and passed at the weirs would have ***low*** impacts on fish. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Low impacts from handling of fish caught and passed at the weirs. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Surface Water Withdrawal on ESA-listed and Other Fish | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts. | ***Crystal Springs Hatchery:*** No impacts |
| | ***Yankee Fork and Panther Creek:*** Slightly reduced flow in the Yankee Fork and Panther Creek reach from the facility diversion to the facility outflow would cause a ***low***, minor, local impact. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Broodstock Collection at Adult Traps | ***Yankee Fork and Panther Creek:*** Short delays (several hours) would occur in bull trout and Chinook salmon migration during weir operations. Handling of these species would also cause stress and possible injury during weir operations. However, the Tribes would implement a fish-handling plan to minimize migration delay and handling impacts on non-target species, resulting in a ***low*** impact from broodstock collection. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** With temporary weirs, the same potential for delays and handling impacts could occur and similar methods for minimizing delay and handling stress would be implemented, resulting in ***low*** potential for impacts from broodstock collection | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts |
| Competition Between Naturally Produced Spring-run Chinook Salmon and ESA-Listed Fish in the Salmon River Basin | ***Yankee Fork and Panther Creek:*** Studies of competitive interactions between introduced juvenile spring Chinook salmon and native steelhead in the in the effected basins indicate that the impacts on juvenile steelhead productivity would likely be low.<br>Juvenile spring Chinook could be prey for juvenile bull trout, but increased numbers of adult Chinook could out-compete bull trout for spawning areas if habitat were limited. | ***Yankee Fork and Panther Creek:*** Impacts of straying would be reduced compared to full production because of the lower production of Chinook salmon in Yankee Fork and Panther Creek. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Impacts of straying would be reduced compared to full production because of the lower production of Chinook salmon in Yankee Fork and Panther Creek. | ***Yankee Fork and Panther Creek:*** No impacts |
| Effects of Straying | ***Yankee Fork and Panther Creek:*** A ***low*** incidence of straying would be expected due to Crystal Springs Hatchery Program design features. | ***Yankee Fork and Panther Creek:*** Impacts would be further reduced compared to full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Incidental Harvest | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** | ***Yankee Fork and Panther Creek:*** |

| Impact | Alternative 1: Full Production | Alternative 1: 50% Production | Alternative 2: Full Production | Alternative 2: 50% Production | No Action Alternative |
|---|---|---|---|---|---|
| on ESA-Listed Fish | Some incidental mortality of steelhead and bull trout would occur when harvesting for Chinook salmon; however, the numbers affected would not exceed levels acceptable to fisheries agencies, a ***low*** impact. | Impacts of incidental harvest would be reduced compared to full production. | Same as Alternative 1. | Same as Alternative 1. | No impacts. |
| Wild and Scenic Rivers: Fish ORV | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** At Yankee Fork and at Panther Creek, the purpose of the Crystal Springs Hatchery Program is to restore and maintain fish runs, which thereby supports the Fish ORV for these streams, a **low** beneficial impact on fish. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.8, Wildlife | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Effects of Facility Construction on Special-Status Wildlife | ***Crystal Springs Hatchery:*** Implementing project design measures, construction timing restrictions, and revegetation practices would minimize risk of impacts related to the removal of low-quality wildlife habitat and generation of noise associated with construction work, ensuring impacts on wildlife and wildlife habitat are ***low***. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Implementing project design measures, construction timing restrictions, and revegetation practices would minimize risk of impacts related to the removal of low-quality wildlife habitat, temporary diversion of the stream channel, and generation of noise associated with construction work, ensuring impacts on wildlife and wildlife habitat are ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because of the absence of permanent structures, construction impacts on wildlife and wildlife habitat would be ***low.*** | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Effects of Facility Operations on Special-Status Wildlife | ***Crystal Springs Hatchery:*** Project design measures would minimize the risk of impacts associated with operational activity, noise, light, and hazing, resulting in ***low*** impacts on wildlife. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Project design measures would minimize the risk of impacts | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** Same as Alternative 1. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| | associated with operational activity and hazing, resulting in ***low*** impacts on wildlife. | | | | |
| Wild and Scenic Rivers: Wildlife ORV | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. | ***Crystal Springs Hatchery and Yankee Fork:*** Not applicable. |
| | ***Panther Creek:*** By increasing Chinook salmon abundance in Panther Creek, the proposed weir facility would result in a long-term ***low*** beneficial impacts on the Wildlife ORV. | ***Panther Creek:*** Not applicable. | ***Panther Creek:*** Same as Alternative 1. | ***Panther Creek:*** Not applicable. | ***Panther Creek:*** No impacts. |
| Section 3.9, Cultural Resources | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Loss or Alteration of Cultural Resources | ***Crystal Springs Hatchery:*** Construction and operation of the hatchery would result in ***low***, indirect impacts on a nearby former fish hatchery. Minimization measures will be implemented to reduce impacts on cultural resources. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Construction and operation of the weir facilities would result in ***low***, indirect impacts on historic cultural resources near the Yankee Fork and Panther Creek sites. Minimization measures would be implemented if any cultural resources are discovered during site construction. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Construction and operation of the weir facilities would result in ***low***, indirect impacts on historic cultural resources near the Yankee Fork and Panther Creek sites. Because no construction is proposed, there would be no accompanying mitigation measures. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Wild and Scenic Rivers: History ORV | **Crystal Springs Hatchery:** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. |
| | ***Yankee Fork:*** There would be ***no adverse impacts*** on cultural or historic resources that would affect Yankee Fork's eligibility as a Wild and Scenic River. Operations at the weir facility would, however, result in ***low*** beneficial impacts on the Tribes' cultural values as they relate to fish and fish harvesting, which would have a ***low*** beneficial impact on Yankee Fork's eligibility as a Wild and Scenic River.<br>***Panther Creek:*** Not applicable. | ***Yankee Fork:*** Same as full production.<br>***Panther Creek:*** Not applicable. | ***Yankee Fork:*** Same as Alternative 1.<br>***Panther Creek:*** Not applicable. | ***Yankee Fork:*** Same as Alternative 1.<br>***Panther Creek:*** Not applicable. | ***Yankee Fork:*** No impacts.<br>***Panther Creek:*** Not applicable. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| **Section 3.10, Socioeconomics and Environmental Justice** | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low beneficial impact<br>Yankee Fork and Panther Creek: Low beneficial impact | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low beneficial impact<br>***Yankee Fork and Panther Creek:*** Low beneficial impact | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Moderate impacts to tribal treaty rights and an environmental justice population (Shoshone-Bannock Tribal members)<br><br>***Yankee Fork and Panther Creek:*** Moderate impacts. |
| Condition of Socioeconomic Resources | ***All Proposed Facilities:***<br>Construction and operation of the Crystal Springs Hatchery Program would have ***low*** impacts on population, employment, income, government revenue, housing, and public services and infrastructure. Fish production would support new and expanded recreational and tribal fisheries in the Upper Salmon River, which would have a ***low*** beneficial impact on the economic, cultural, and spiritual/tribal value of Chinook salmon. | ***All Proposed Facilities:***<br>Same as full production; however, the benefits of fish production would be diminished in proportion to the relative decrease of adult Chinook salmon in Yankee Fork and Panther Creek. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Fish production anticipated under Alternatives 1 and 2 would not occur, diminishing opportunities for new and expanded recreational and tribal fisheries in the Upper Salmon River. This would have a ***moderate*** impact on the economic, cultural, and spiritual/tribal value of Chinook salmon. |
| Environmental Justice Considerations | ***All Proposed Facilities:***<br>No adverse impacts are identified. The production of Chinook salmon and Yellowstone cutthroat trout would have a ***low*** beneficial impact on minority and low-income populations associated with the Shoshone-Bannock Tribes and the Fort Hall Indian Reservation. | ***All Proposed Facilities:***<br>Same as full production; however, the benefits of fish production would be diminished in proportion to the relative decrease of adult Chinook salmon in Yankee Fork and Panther Creek. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Same as Alternative 1. | ***All Proposed Facilities:***<br>Fish production anticipated under Alternatives 1 and 2 would not occur, resulting in a ***moderate*** impact on minority and low-income populations associated with the Shoshone-Bannock Tribes and the Fort Hall Indian Reservation. |
| **Section 3.11, Air Quality and Climate Change** | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Adverse Impacts on Air Quality | ***Crystal Springs Hatchery:***<br>Construction impacts, primarily dust and vehicle emissions, would be mitigated to ***low*** levels. Operational impacts would be ***low*** due to the small size of the facility and low numbers of vehicle trips. | ***Crystal Springs Hatchery:***<br>Same as full production, although operational impacts could be slightly reduced. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>Same as Alternative 1. | ***Crystal Springs Hatchery:***<br>No impacts. |
| | ***Yankee Fork and Panther Creek:***<br>Construction impacts, primarily dust and vehicle emissions, would be mitigated to ***low*** levels. Operational impacts would be ***very low*** due to the small size of the facility, limited operating season, and low numbers of vehicle trips. | ***Yankee Fork and Panther Creek:***<br>Same as full production, although operational impacts could be slightly reduced. | ***Yankee Fork and Panther Creek:***<br>Because no construction is proposed, there would be ***no construction impacts*** on air quality. Operational impacts would be ***very low*** due to the small size of the facility, limited operating season, and low numbers of vehicle trips. | ***Yankee Fork and Panther Creek:***<br>Same as full production, operational although impacts could be slightly reduced. | ***Yankee Fork and Panther Creek:***<br>No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| Greenhouse Gas Emissions | ***Crystal Springs Hatchery:*** Greenhouse gas emissions from both construction and operations would be ***low***, even without implementing mitigation. | ***Crystal Springs Hatchery:*** Same as full production, although operational impacts could be slightly reduced. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Greenhouse gas emissions from both construction and operations would be ***low***, even without implementing mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production, although operational impacts could be slightly reduced. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no construction impacts*** associated with greenhouse gas emissions. Due to the operational nature of the temporary weir structures, greenhouse gas emissions associated with operations at these facilities would also be ***low***. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.12, Visual Quality | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Changes in Visual Resources | ***Crystal Springs Hatchery:*** Construction would have a ***low***, temporary impact not requiring mitigation. Operations would produce potential glare and night lighting from new structures; however, implementing mitigation would reduce these impacts to a ***low*** level. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Construction would have a ***low***, temporary impact not requiring mitigation. Operations would produce potential glare and coloration impacts from new structures; however, implementing mitigation would reduce these impacts to a ***low*** level. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***low*** impacts on visual resources. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Wild and Scenic Rivers: Scenery ORV | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** Not applicable. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:***<br>Because the proposed weir facility would be painted and textured to be consistent with existing structures nearby, is located in a confined canyon with minimal views of the background scenery, and interpretive signs would be added to benefit scenery and recreation, impacts on the Scenery ORV would be ***low***. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Same as full production. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Same as Alternative 1. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** Same as Alternative 1. | ***Yankee Fork:*** Not applicable.<br>***Panther Creek:*** No impacts. |
| Section 3.13, Noise | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |

| Impact | Alternative 1 | | Alternative 2 | | No Action Alternative |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | |
| Generation of Noise | ***Crystal Springs Hatchery:*** Both construction and operations would have ***low*** impacts related to noise, requiring no mitigation; however, best management practices are recommended to further reduce impacts. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Construction noise would be intermittently discernible at Pole Flat Campground (Yankee Fork site) and at the USFS Panther Creek housing units; however, these are ***low*** impacts requiring no mitigation, although best management practices are recommended to further reduce impacts. Operational noise would be ***low***, requiring no mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Since no construction is proposed, there would be no construction impacts. Operations noise would be ***low***, needing no mitigation. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Section 3.14, Public Health and Safety | | | | | |
| *Overall Potential Impact* | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Moderate | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Moderate | ***Crystal Springs Hatchery:*** Low<br>***Yankee Fork and Panther Creek:*** Low |
| Creation of Infrastructure and Environmental Hazards | ***Crystal Springs Hatchery:*** Risks associated with infrastructure and environmental hazards during construction would be ***low*** by incorporating facility design to minimize risks, selecting appropriately qualified construction workers, complying with federal and state safety standards, and implementing best management practices. Operational impacts would include risks to hatchery workers, which would be minimized by hiring appropriately qualified workers and complying with federal and state safety standards, resulting in ***low*** impacts on public health and safety associated with infrastructure and environmental hazards. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Risks associated with infrastructure and environmental hazards during construction would be ***low*** with implementation of best management practices. Operational impacts would include risks to Tribal workers while trapping fish, which would be minimized by worker training and | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be no construction risks associated with infrastructure and environmental hazards. Operational impacts would be **moderate** due to risks associated with installation, maintenance, and removal of the temporary weirs. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| | implementing several strategies to minimize the risks associated with working in and near a river. Chain link fences, gates, and signage would minimize public health and safety risks of the permanent weir facilities to the general public. The overall resulting impacts would be low. | | | | |
| Use of Hazardous Materials | ***Crystal Springs Hatchery:*** Risks associated with the use of hazardous materials during construction would be minimized by implementing measures identified in a spill control containment and countermeasures plan; resulting in ***low*** impacts on public health and safety. Risks associated with the use and storage of hazardous materials during hatchery operations would be minimized by facility design, complying with federal and state safety standards, and implementing best management practices, resulting in ***low*** impacts on public health and safety. | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |
| | ***Yankee Fork and Panther Creek:*** Risks associated with the use of hazardous materials during construction would be minimized by implementing measures identified in a spill control containment and countermeasures plan; resulting in ***low*** impacts on public health and safety. Risks associated with the use and storage of hazardous materials during weir operations, such as formalin, would be minimized by facility design, complying with federal and state safety standards, and implementing best management practices, resulting in ***low*** impacts on public health and safety. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no*** *construction impacts* associated with the use of hazardous materials. During weir operations, small amounts of hazardous materials, such as fish anaesthetic, would be used at the site resulting in ***low*** *operational impacts* associated with the use of hazardous materials. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |
| Use of Energy Sources | ***Crystal Springs Hatchery:*** Small amounts of electricity and fuels would be used for a short duration during construction, resulting in ***low*** impacts on local energy sources. The amount of electricity needed to supply hatchery operations would be minimal and should have ***low*** impacts on the local availability of electricity. The | ***Crystal Springs Hatchery:*** Same as full production. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** Same as Alternative 1. | ***Crystal Springs Hatchery:*** No impacts. |

| Impact | Alternative 1 | | Alternative 2 | | |
|---|---|---|---|---|---|
| | Full Production | 50% Production | Full Production | 50% Production | No Action Alternative |
| | amount of fuel needed for vehicle use at the hatchery is anticipated to be a fraction of the total amount of fuel sold in Idaho and should have ***low*** impacts on fuel supplies. | | | | |
| | ***Yankee Fork and Panther Creek:*** Small amounts of electricity and fuels would be used for a short duration during construction, resulting in ***low*** impacts on local energy sources. The amount of electricity needed to supply the proposed permanent weir facilities would be minimal and should have ***low*** impacts on the local availability of electricity. The amount of fuel needed for vehicle use at the weir facilities is anticipated to be a fraction of the total amount of fuel sold in Idaho and should have ***low*** impacts on fuel supplies. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** Because no construction is proposed, there would be ***no*** *construction impacts* on local supplies of electricity and diesel. During operations, electricity would not be needed at the temporary weir facilities and, therefore, would ***not impact*** the local availability of electricity. The amount of fuel needed for vehicle use at the temporary weir facilities is anticipated to be a fraction of the total amount of fuel sold in Idaho and should have ***low*** impacts on fuel supplies. | ***Yankee Fork and Panther Creek:*** Same as full production. | ***Yankee Fork and Panther Creek:*** No impacts. |

**Table 2-9. Summary of Mitigation Measures for Alternative 1 and Alternative 2**

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| Section 3.1, Land Use and Recreation | | |
| Construction | **Crystal Springs Hatchery**<br>No mitigation is required during construction of the Crystal Springs hatchery.<br>**Yankee Fork Weir Facility**<br>Minimize disruption and adverse impacts on the customary users of the Pole Flat Campground and picnic area near Yankee Fork weir facility during construction by implementing the following measures:<br>● Coordinate with USFS staff to ensure access to the campground is maintained for as much time as is possible and reasonably safe. Consult with USFS to determine if temporary closure would be less disruptive.<br>● If facilities are temporarily or permanently relocated, signage for new or alternate facilities should be clearly posted.<br>● Coordinate with USFS staff to schedule construction activities to coincide with lower-use periods during the recreational season (e.g., on weekdays, or during less favorable fishing and boating conditions).<br>● Coordinate with USFS staff to minimize noise and visual disruption to recreational users by efficiently scheduling construction activities and staging work areas away from recreational areas to the greatest extent possible.<br>● Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of in-water construction and provide portage instructions.<br>**Panther Creek Weir Facility**<br>Use temporary signage to warn vehicles traveling through the area of increased construction traffic near the Panther Creek site under Alternative 1. See Section 3.2, *Transportation*, for additional mitigation measures to address safety concerns and road closure on Panther Creek Road.<br>Coordinate with USFS staff to determine if signage or other | **Crystal Springs Hatchery**<br>Mitigation is not required during construction of the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is proposed. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | measures are necessary to warn boaters on Panther Creek of in-water construction. Implement safety measures as needed. | |
| Operations | **Crystal Springs Hatchery**<br>Mitigation is not required during operation of the Crystal Springs hatchery.<br>**Yankee Fork Weir Facility**<br>Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of the presence and seasonal use of the weir and provide portage instructions.<br>**Panther Creek Weir Facility**<br>Coordinate with USFS staff to determine if signage or other measures are necessary to warn boaters on Panther Creek of seasonal use of in-water structures. Implement safety measures as needed. | **Crystal Springs Hatchery**<br>Mitigation is not required during operation of the Crystal Springs hatchery.<br>**Yankee Fork Weir Facility**<br>Coordinate with USFS staff to identify ways to offset occupation of campsites at Pole Flat Campground if permanent reservation is required, or minimize temporary occupation of campsites during periods of high demand.<br>Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of the seasonal use of the weir and provide portage instructions.<br>**Panther Creek Weir Facility**<br>Implement the same mitigation recommended under Alternative 1 for the Panther Creek weir facility. |
| Section 3.2, Transportation | | |
| Construction | **Crystal Springs Hatchery**<br>Northbound traffic that approaches the Crystal Springs hatchery site from the south would need signage because of limited visibility while approaching the site. Signs would be placed well in advance of the site to make oncoming traffic slow down. Additional signage and flaggers would be used when oncoming traffic needs to come to a complete stop to accommodate construction trucks entering or leaving the facility.<br>**Yankee Fork Weir Facility**<br>Flaggers in the road during construction would help halt traffic while trucks pull into or out of the worksite to help slow traffic and limit risk of collisions. Traffic safety impacts from the interaction of fast-moving vehicles and construction crews would be mitigated by providing adequate signage and warning of the need for cars to slow or stop in advance of the site in order to allow construction trucks to enter or leave the site.<br>**Panther Creek Weir Facility**<br>Flaggers in the road during construction would help halt traffic | **Crystal Springs Hatchery**<br>Implement the same mitigation measures recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | while trucks pull into or out of the worksite to help slow traffic and limit risk of collisions. Traffic safety impacts from the interaction of fast-moving vehicles and construction crews can be mitigated by providing adequate signage and warning of the need for cars to slow or stop in advance of the site in order to allow construction trucks to enter or leave the site.<br>In order to mitigate the impacts of periodic delays (of no more than 1 hour), signs will be posted at the entrance to Morgan Creek Road, Williams Creek/Deep Creek Road, and the entrance to Panther Creek Road at the Salmon River Road confluence advising drivers of potential delays due to construction. Impacts would be mitigated by providing advance notification to affected parties (including private landowners, range permittees, USFWS and USFS employees, and people pursuing outdoor recreation) and by scheduling the closure in the lowest-use time of the season. Scheduling the closure before October would avoid interrupting the usage of the road by hunters. While precise traffic volume estimates are not available to determine the time of year with the lowest volume, interviews with members of the outdoor recreation community in the region may demonstrate when access to those sections of the forest are the most important. | |
| Operations | Impacts during operation at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites are considered low; no mitigation is required. | Impacts during operation at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites are considered low; no mitigation is required. |
| Section 3.3, Geology and Soils | | |
| Construction | **Crystal Springs Hatchery**<br>Implement the following mitigation measures to reduce construction-related impacts on geology and soils at the Crystal Springs hatchery site.<br>● Silty sand and sand with gravel at the site would be reused as structural fill if it meets certain requirements outlined in the geotechnical engineering report, especially if the earthwork is conducted during dry weather.<br>● The topsoil at the site is not suitable for use as structural fill or to bear structures. Therefore, it would be excavated, | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | removed, and stockpiled for reuse as landscape fill (which would minimize soil resource depletion) or removed from the site. The extent of reuse of on-site soils would be determined during construction. There is potential to reuse excavated material at the outdoor tank area and for some of the minor road fills for the residence drives.<br>● The design would maximize use of pervious gravel instead of impervious concrete for the constructed surfaces. This would retain a large portion of site infiltration capacity, thereby limiting increased stormwater runoff that could result in increased soil erosion.<br>● The hatchery would be constructed using standard erosion control measures and best management practices according to the guidelines of the ITD Sediment and Erosion Control Manual. Prior to construction, the contractor would submit an erosion and sediment control plan, signed and stamped by a registered civil engineer, that meets all federal, state, and local requirements. Specific erosion control measures for the hatchery site for Alternatives 1 and 2 are described in Appendix C. For additional information on the potential environmental consequences of soil erosion on water quality and fish, see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, and Section 3.7, *Fish*.<br>● Shallow groundwater would likely be encountered, particularly during spring snowmelt, and any excavation extending below anticipated groundwater levels would incorporate a dewatering plan.<br>● Site excavations would be sloped in accordance with the Occupational Safety and Health Administration regulations and local codes.<br>● Construction activities, particularly earthwork, would be performed as rapidly as possible and/or during drier, low flow conditions (late summer and fall) to reduce the potential for remedial earthwork.<br>● The 2009 IBC would be utilized for project structural design. Section 1615.1 of the 2009 IBC outlines the procedure for | |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | evaluating site ground motions and design spectral response accelerations recommend a Site Class D be utilized as a basis for structural seismic design.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the following mitigation measures to reduce construction-related impacts on geology and soils at the Yankee Fork and Panther Creek weir facilities.<br>● Shallow groundwater would likely be encountered, particularly during spring snowmelt, and any excavation extending below anticipated groundwater levels would incorporate a dewatering plan.<br>● Site excavations would be sloped in accordance with the Occupational Safety and Health Administration regulations and local codes.<br>● Construction activities, particularly earthwork, would be performed as rapidly as possible and/or during drier, low flow conditions (late summer and fall) to reduce the potential for remedial earthwork.<br>● Topsoil and soil containing significant vegetation and organics is not suitable for use as structural fill or to bear structures over. As such, it would be excavated, removed, and stockpiled for reuse as landscape fill, or removed from the site.<br>● The on-site silty gravel and poorly graded gravel with sand and silt would be reused as general structural fill provided it meets the requirements.<br>● Riprap or coarse alluvium would be placed next to the bridge weir abutments to protect against bank erosion and damage to the abutment. This would not protect against lateral migration that occurs upstream of the bridge weir. Riprap or other bank stabilization material could be extended further up the channel to provide additional bank protection. However, this may be unnecessary as the existing bridge a short distance upstream of the proposed weir may limit future migration in the bridge weir vicinity. | |
| Operations | **Crystal Springs Hatchery** | **Crystal Springs Hatchery** |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | Implement the following mitigation measures to reduce operations impacts on geology and soils at the Crystal Springs hatchery site.<br>● To protect against potential soil erosion, a Stormwater Pollution Prevention Plan that meets the Environmental Protection Agency's erosion and stormwater control BMPs would be implemented and stormwater runoff from the site would be attenuated by being channeled through a concrete dual-chambered settling pond before being combined with overflow drains that would discharge through an approximately 180-foot-long pipe into McTucker Creek.<br>● The increase in flow to McTucker Creek due to hatchery operations would be expected to result in increased overbanking and ponding of water instead of increased channel velocities with the potential to erode the channel. Channel conditions in McTucker Creek would be visually monitored during operations to ensure that no adverse erosion is occurring due to the increased discharge. If erosion is detected, then appropriate response measures would need to be developed to avoid further erosion.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>The potential for bridge scour would be most likely to occur during the high-flow months when Panther Creek has the most energy. During high flows the concrete weir sill and abutments would be the only part of the bridge weir in place in the channel. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. No scour analysis was performed on the design; however, this configuration of the weir foundation would minimize scour and maintain the channel at the same approximate elevation. If scour were to become problematic, then riprap or coarse alluvium could be placed on the bed to protect the sill and abutments. | Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Scour is unlikely to occur under Alternative 2 since no permanent weir facility would be constructed. No mitigation would be required. |
| Section 3.4, Vegetation | | |
| Construction | Implement the following mitigation measures to reduce | **Crystal Springs Hatchery** |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | construction-related impacts on vegetation at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites<br>● Explain vegetation-related mitigation measures to construction contractors and inspectors during a preconstruction meeting covering environmental requirements.<br>● Restrict construction activities to the area needed to work effectively to limit disturbance of native vegetation communities to the minimum amount necessary.<br>● Prior to construction, control noxious weeds either manually, mechanically, or chemically as recommended for each species, focusing on species with small, localized infestations to reduce the potential for widespread establishment and the need for long-term management.<br>● Use vehicle and equipment cleaning stations to minimize the spread of weeds to uninfected areas during construction by cleaning vehicles and equipment prior to entering and as soon as possible after leaving each work area.<br>● Use weed-free mulch and straw where such materials are needed for erosion control.<br>● Use local sources of rock for road construction and obtain road fill materials from noxious weed-free quarries.<br>● Reseed disturbed areas after construction is complete, at the appropriate time period for germination, with a native seed mix recommended by BPA or the Idaho State Department of Agriculture.<br>● Monitor vegetation cover of seeded areas with at least three field visits per year until site stabilization (defined as at least 70% cover by plant species other than Idaho State Department of Agriculture-listed noxious weeds) is achieved; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.<br>● Approximately 1 year after construction, conduct a noxious weed survey of all areas disturbed by construction activities to determine if there are new noxious weed infestations. | Implement the same mitigation recommended under Alternative 1 for construction of the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | Implement appropriate control measures of noxious weed infestations.<br>● Implement applicable *General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs* included in the *USDA–Forest Service Guide to Noxious Weed Prevention Practices* into the construction and operation plans. | |
| Operations | **Crystal Springs Hatchery**<br>No mitigation is recommended during operation of the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement all applicable *General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs* included in the *USDA–Forest Service Guide to Noxious Weed Prevention Practices* into the construction and operation plans, as follows:<br>● **Practice 1.** Perform environmental analysis for projects and maintenance programs to assess weed risks, analyze potential treatment—including herbicides, if needed—of high-risk sites for weed establishment and spread, and identify prevention practices. Determine prevention and maintenance needs at the onset of project planning.<br>● **Practice 2.** Inventory and prioritize weed infestations for treatment in project operating areas and along access routes before ground-disturbing activities begin. Identify what weeds are on site, or within reasonably expected potential invasion vicinity, and conduct a risk assessment accordingly. Control weeds as necessary.<br>● **Practice 3.** Begin project operations in un-infested areas before operating in weed-infested areas.<br>● **Practice 4.** Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules is least likely.<br>● **Practice 7.** Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal consists of bagging the seeds and plant parts | **Crystal Springs Hatchery**<br>No mitigation is recommended during operation of the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the same mitigation recommended under Alternative 1 for the Yankee Fork and Panther Creek weir facilities. |

| Environmental Resource | Alternative 1 | Alternative 2 |
| --- | --- | --- |
| | and incinerating them. | |
| Section 3.5, Groundwater and Surface Water Quality and Quantity | | |
| Construction | **Crystal Springs Hatchery**<br>Implement the following measures to reduce impacts on water quality and water quantity during construction at the Crystal Springs hatchery site.<br>● Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and sediment-laden waters are drained 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.<br>● 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.<br>● Wash heavy equipment that may work below the ordinary high water mark elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.<br>● Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.<br>● Inspect machinery daily for fuel or lubricant leaks.<br>● 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.<br>● To the greatest extent possible, minimize the size of construction disturbance areas and the removal of vegetation.<br>● Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is required as the temporary weir would be placed and removed by hand and no water would be diverted or discharged. |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | remove them from the proposed hatchery site when vegetation is re-established and the area has been stabilized.<br>● Implement an SPCC plan that requires storage of fuel and other potential pollutants in a secure location at least 300 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 requires 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 regulations.<br>● Restrict refueling and servicing operations to locations at least 300 feet from streams, water bodies, and wetlands where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes); use pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.<br>● Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of 300 feet away from any stream, water bodies, or wetland.<br>● Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.<br>● Reseed disturbed areas after construction and regrading are complete at the appropriate time period for germination.<br>● Monitor germination of seeded areas; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.<br>● Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion levels.<br>● Comply with the construction NPDES permit.<br>● Train all staff in regard to chemical handling and application safety. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | ● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.<br>Modeling has indicated that the use of groundwater at the Crystal Springs hatchery site would have a low impact on the aquifers. Observations at the Crystal Springs hatchery site have noted no change in artisanal water flow from the existing wells while the Springfield Hatchery has been operational; however, once pumps are installed and operational the Tribes would conduct a pump test on the proposed wells at the Crystal Springs hatchery site to determine actual effects on the groundwater resource during periods of peak water demand for fish rearing (March).<br>If water diversions to the hatchery result in reduced surface water levels in the existing ponds from the old hatchery, pond water levels would be maintained through placement of stop logs in the existing racks at the pond outlets.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the following measures to reduce impacts on water quality and water quantity during construction at the Yankee Fork and Panther Creek weir facilities.<br>● Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and sediment-laden waters are drained 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.<br>● 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.<br>● Conduct in-water work during approved in-water work windows.<br>● Wash heavy equipment that may work below the ordinary high water mark elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic | |

| Environmental Resource | Alternative 1 | Alternative 2 |
|---|---|---|
| | invasive species.<br>● Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.<br>● Inspect machinery daily for fuel or lubricant leaks.<br>● 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.<br>● To the greatest extent possible, minimize the size of construction disturbance areas and the removal of vegetation.<br>● 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.<br>● Implement an SPCC plan that requires storage of fuel and other potential pollutants in a secure location at least 300 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 requires 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 regulations.<br>● Restrict refueling and servicing operations to locations at least 300 feet from streams, water bodies, and wetlands where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes); use pumps, funnels, absorbent pads, and drip pans when fueling or servicing vehicles.<br>● Store, fuel, and maintain vehicles and equipment in | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | designated vehicle staging areas located a minimum of 300 feet away from any stream, water bodies, or wetland.<br>● Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pretreatment to meet state water quality standards.<br>● Reseed disturbed areas after construction and regrading are complete at the appropriate time period for germination.<br>● Monitor germination of seeded areas; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.<br>● Inspect and maintain access roads and other facilities after construction to ensure proper function and nominal erosion levels.<br>● Comply with the NPDES permit.<br>● Comply with the TMDL allocations for the American Falls Reservoir subbasin.<br>● Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.<br>● Train all staff in regard to chemical handling and application safety.<br>● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| Operations | **Crystal Springs Hatchery**<br>Implement the following measures to reduce impacts on water quality and water quantity during hatchery operations at the Crystal Springs hatchery site.<br>● Comply with the NPDES permit for hatchery discharges.<br>● Comply with the TMDL allocations for the American Falls Reservoir subbasin.<br>● Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.<br>● Train all staff in regard to chemical handling and application safety.<br>● Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.<br>Modeling has indicated that the use of groundwater at the Crystal Springs hatchery site would have a low impact on the aquifers. Observations at the Crystal Springs hatchery site have noted no change in artisanal water flow from the existing wells while the Springfield Hatchery has been operational; however, once pumps are installed and operational, the Tribes would conduct a pump test on the proposed wells at the Crystal Springs hatchery site to determine actual effects on the groundwater resource during periods of peak water demand for fish rearing (March).<br>If water diversions to the hatchery result in reduced surface water levels in the existing ponds from the old hatchery, pond water levels would be maintained through placement of stop logs in the existing racks at the pond outlets.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the following measures to reduce impacts on water quality and water quantity during weir facility operations at the Yankee Fork and Panther Creek sites.<br>● Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is required as the temporary weir would be placed and removed by hand and no water would be diverted or discharged. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | and federal regulations to protect human and environmental health.<br>• Train all staff in regard to chemical handling and application safety.<br>• Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.<br>• If formalin is used, insure that the concentration of formalin in the discharge is at or below 1 mg/L. | |
| Section 3.6, Wetlands and Floodplains | | |
| Construction | **Crystal Springs Hatchery**<br>The following measures would be implemented at the Crystal Springs hatchery to minimize impacts on wetlands and floodplains.<br>• Review water quality mitigation measures, required BMPs, and permit requirements with construction contractors and inspectors during a preconstruction meeting covering environmental requirements.<br>• Implement an erosion control and sedimentation plan, which would include sedimentation and erosion control measures, such as silt fences, straw bales, and jute matting to prevent sediment from entering waterways and wetland habitats.<br>• Implement a fugitive dust control plan including the use of water trucks or other appropriate methods to control dust during construction, the use of gravel on access road surfaces in areas of sustained wind to reduce potential dust erosion, and the establishment of a 15-mile-per-hour speed limit for construction vehicle use on unpaved roads and surfaces.<br>• Install signage, fences, and flagging to restrict work areas and confine vehicles and equipment to designated routes that avoid wetlands and waterways.<br>• When working next to wetlands and waterways, limit disturbance to the minimum necessary to achieve | **Crystal Springs Hatchery**<br>The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | construction objectives, minimize habitat alteration, and limit the effects of erosion and sedimentation.<br>• Implement a Spill Prevention, Control, and Countermeasures (SPCC) plan in accordance with federal, state, and local requirements. At a minimum, the SPCC should address fuel and chemical storage, spill containment and cleanup, construction contractor training, and proper spilled material disposal activities.<br>• Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of 300 feet from any wetlands, streams, or other water bodies.<br>• Inspect machinery regularly for leaks.<br>• Revegetate temporarily disturbed areas with appropriate native species.<br>• Develop and implement a work area isolation/dewatering plan for instream work that includes provisions for erosion and sediment control.<br>• Check all equipment for leaks, and, prior to entering wetlands, waterways, or floodplains, and completely clean off any external petroleum products, hydraulic fluid, coolants, and other pollutants.<br>• Re-grade disturbed areas to pre-construction contours and revegetate with appropriate native species.<br>**Yankee Fork Weir Facility**<br>Implement the same mitigation measures recommended for construction of the Crystal Springs hatchery under Alternative 1.<br>**Panther Creek Weir Facility**<br>Implement the same mitigation measures recommended for construction of the Crystal Springs hatchery under Alternative 1. In addition, stockpile wetland soils removed from Wetland Panther-A at the Panther Creek weir facility during diversion channel construction and use them to re-fill the channel once construction is completed. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| Operations | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1. | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1. |
| Section 3.7, Fish | | |
| Construction | **Crystal Springs Hatchery**<br>Water quality mitigation measures to protect fish during construction would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Crystal Springs hatchery site under Alternative 1. No other mitigation would be required.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Water quality mitigation measures to protect fish during construction would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Yankee Fork and Panther Creek weir facilities under Alternative 1. Additional mitigation would include implementation and compliance with a NMFS-approved fish salvage and relocation plan. In-water construction would also occur within approved in-water work windows. | **Crystal Springs Hatchery**<br>The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |
| Operations | **Crystal Springs Hatchery**<br>Water quality mitigation measures to protect fish during hatchery operations would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Crystal Springs hatchery site under Alternative 1. No other mitigation would be required.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Water quality mitigation measures to protect fish during weir facility operations would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Yankee Fork and Panther Creek weir facilities under Alternative 1.<br>Additional mitigation would include implementation and compliance with a NMFS-approved fish handling plan during operation. The Tribes would also operate under the annual Idaho Scientific Collection permits and the NMFS Section 10 | **Crystal Springs Hatchery**<br>The same mitigation measures recommended for Alternative 1 operations at the Crystal Springs hatchery would also be implemented under Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is recommended; however, the Tribes would implement and comply with NMFS-approved fish handling plans, as well as comply with the annual Idaho Scientific Collection permits and NMFS Section 10 Scientific Research permits for the weir facilities. Captured fish would be transported by truck from the weir facilities, and no holding or acclimation would be required at the Yankee Fork and Panther Creek sites. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | Scientific Research permits for the weir facilities.<br>Daily monitoring for bull trout congregating above and below the weirs would be conducted daily by the Tribes. If congregations are evident, a section of the weir would be opened to facilitate migration through the weir facility.<br>If formalin treatments are necessary, the discharge would be managed to ensure 1 milligram per liter or less would be discharged to Yankee Fork or Panther Creek. | |
| Section 3.8, Wildlife | | |
| Construction | The following measures apply to construction at the Crystal Springs hatchery, Yankee Fork and Panther Creek sites.<br>● Avoid clearing trees or other vegetation that may contain nesting migratory birds during the migratory bird nesting season, which may occur as early as January (primary for owls and hawks) and continue through July of any given year. Clearing may be conducted during the nesting season if nest sites are determined to be absent by a qualified biologist, and if approved by designated Idaho Fish and Game or U.S. Fish and Wildlife Service representatives.<br>● Erect temporary fencing around areas that are not to be disturbed to protect them during construction.<br>● Develop and implement a plan to revegetate temporarily disturbed areas to provide wildlife habitats and reduce the risk of weed encroachment.<br>**Crystal Springs Hatchery**<br>In addition to the measures listed above, implement the following measures at the Crystal Springs hatchery site to minimize impacts on wildlife.<br>• Minimize disturbance to big sagebrush vegetation cover type.<br>• Check for nesting birds in abandoned structures and do not demolish structures when active nests are present.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No site-specific measures for weir facility operations, in addition to the measures already listed above, are recommended at the | **Crystal Springs Hatchery**<br>The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | Yankee Fork and Panther Creek sites under Alternative 1. | |
| Operations | The following measures apply to operations at the Crystal Springs hatchery, Yankee Fork and Panther Creek sites.<br>● Minimize lighting and use lighting fixtures that direct light downward and not towards off-site areas to minimize disturbance to wildlife.<br>● Install fish screens at water intake structures to minimize entrainment of aquatic species.<br>● Develop and implement a plan to minimize and manage predatory wildlife being attracted to fish and other potential food sources available at the facility.<br>**Crystal Springs Hatchery**<br>No site-specific measures for hatchery operations are recommended at the Crystal Springs hatchery site under Alternative 1.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>At the Yankee Fork and Panther Creek weir facilities, develop a plan to avoid human/wildlife conflicts prior to distributing carcasses of spawned adults. | The same mitigation measures recommended for Alternative 1 operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would also be implemented under Alternative 2. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| Section 3.9, Cultural Resources | | |
| Construction | The following mitigation measures would be implemented to avoid or minimize impacts on cultural resources during construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:<br>● Mark known cultural resource sites as avoidance areas on construction drawings and flag as no-work areas in the field prior to construction.<br>● Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan.<br>● Protect any unanticipated cultural resources discovered during construction as follows:<br>○ Stop work in the immediate vicinity of the discovery and protect find in place.<br>○ Notify Tribes Project Manager, BPA Archaeologist, and BPA Environmental Compliance Lead immediately; for activities on Salmon-Challis National Forest Lands, notify the Forest Archaeologist.<br>○ Implement mitigation or other measures as instructed by BPA in consultation with the Tribes, Salmon-Challis National Forest, and Idaho State Historic Preservation Office. | The same mitigation described for construction of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1 would also be implemented for Alternative 2. |
| Operations | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1. | No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 2. |
| Section 3.10, Socioeconomics and Environmental Justice | | |
| Construction/ Operations | The Hatchery Program is expected to result in **low** adverse or beneficial construction- and operations-related impacts on socioeconomic resources. Therefore, no mitigation measures are recommended for Alternative 1. | The Hatchery Program is expected to result in **low** adverse or beneficial construction- and operations-related impacts on socioeconomic resources. Therefore, no mitigation measures are recommended for Alternative 2. |
| Section 3.11, Air Quality and Climate Change | | |
| Construction | **Crystal Springs Hatchery**<br>The Tribes would implement the following best management practices to minimize air quality impacts associated with | **Crystal Springs Hatchery**<br>The same mitigation measures recommended for Alternative 1 at the Crystal Springs hatchery site would also be implemented |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | construction at the Crystal Springs hatchery:<br>● Sequence and schedule construction work to minimize the amount of bare soil exposed to wind erosion.<br>● Use water trucks to control dust during construction, as needed.<br>● If dust-abatement additives or stabilization chemicals (typically magnesium chloride, calcium chloride salts, or lignin sulfonate) are used, the following additional measures would be implemented:<br>○ Do not apply dust-abatement additives and stabilization chemicals within at least 25 feet of surface water (distances might be greater where vegetation is sparse) and apply them so as to minimize the likelihood that they would enter the water.<br>○ Do not use petroleum-based products for dust abatement.<br>○ Avoid application of dust abatement chemicals during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to surface water.<br>○ Ensure spill containment equipment is available during application of dust abatement chemicals.<br>● Transport all vegetation or other debris associated with construction clearing to an approved landfill or composting facility, as applicable. Burning of all such material would not be done; some small-scale vegetation burning may be done for weed control on access roads.<br>● Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.<br>● Implement vehicle idling restrictions.<br>● Encourage carpooling and the use of shuttle vans among construction workers to minimize construction-related traffic and associated emissions.<br>● Locate staging areas in previously disturbed or graveled areas, where practicable, to minimize soil and vegetation | under Alternative 2.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | disturbance.<br>● Encourage the use of the proper size of equipment for each job because larger equipment requires the use of additional fuel.<br>● Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.<br>● Reduce electricity use in the construction office by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.<br>● Recycle or salvage nonhazardous construction and demolition debris where practicable.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>The same mitigation measures recommended for construction at the Crystal Springs hatchery would be implemented at the Yankee Fork and Panther Creek weir facilities. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| Operations | **Crystal Springs Hatchery**<br>The Tribes would implement the following best management practices to minimize air quality impacts associated with operations at the Crystal Springs hatchery:<br>● Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.<br>● Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.<br>● Implement vehicle idling restrictions.<br>● Reduce electricity use during facility operation by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.<br>● Recycle or salvage waste generated during facility operation, where practicable.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>The same mitigation measures recommended for Crystal Springs hatchery operations would be implemented at the Yankee Fork and Panther Creek weir facilities. | The same mitigation measures recommended for Alternative 1 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would also be implemented under Alternative 2. |
| Section 3.12, Visual Quality | | |
| Construction | No mitigation is recommended for construction activities at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site under Alternative 1. | No mitigation is recommended for construction activities at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site under Alternative 2. |
| Operations | **Crystal Spring Hatchery**<br>*Reduce Glare from Buildings and Apply Minimum Lighting Standards.* Use of similar building materials and colors to those found in nearby development would aid in helping the facility to blend with its local surroundings and reduce the appearance of the wall surface. Walls would have low-sheen and non-reflective surface materials to reduce potential for glare. The use of smooth troweled surfaces and glossy paint would be avoided. In addition, white or light colored surfaces would be avoided for the Crystal Springs hatchery and Yankee Fork weir facility because the use of earth-toned colors that complement the surrounding landscape would help to reduce the effects of glare. | **Crystal Spring Hatchery**<br>Refer to Alternative 1 mitigation measure, *Reduce Glare from Buildings and Apply Minimum Lighting Standards,* described for the Crystal Spring hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No mitigation is recommended for operations at the Yankee Fork and Panther Creek sites under Alternatives 2. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | The Yankee Fork weir facility would consider using colors that complement or match nearby historic structures, such as browns or dark tans. The exception to using white colors would be at the Panther Creek weir facility, where the use of white walls and green roofing would enable the facility to better blend with existing USFS buildings that are adjacent to the site. However, coloring the sides of the acclimation holding ponds a shade that is two to three shades darker than the general surrounding area such as a dark evergreen, black, or dark brown color would help these round structures to recede into the visual landscape, rather than stand out amongst the square and rectangular buildings. In addition, the pumping station, degas tower, and aboveground piping would be colored to match the acclimation holding ponds. Appropriate paint types would be selected for the finished material to ensure environmental safety and long-term durability of the painted surfaces. The appropriate operating agency or organization would maintain the paint color over time.<br>All artificial outdoor lighting is to be limited to safety and security requirements and would be designed using Illuminating Engineering Society's design guidelines and in compliance with International Dark-Sky Association approved fixtures. All lighting is to provide minimum impact on the surrounding environment and would utilize downcast, cut-off type fixtures that are shielded and direct the light only towards objects requiring illumination. Therefore, lights would be installed at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky. The lowest allowable wattage would be used for all lighted areas and the number of nighttime lights needed to light an area would be minimized to the highest degree possible. Light fixtures would have non-glare finishes that would not cause reflective daytime glare. Lighting would be designed for energy efficiency, use high-pressure sodium vapor lights with individual photocells, and have daylight sensors or be timed with an on/off program. Lights would provide good color rendering with natural light | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | qualities with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, would be designed to be aesthetically pleasing.<br>Lights along pathways and safety lighting at building entrances and loading areas would employ shielding to minimize off-site light spill and glare and be screened and directed away from employee housing and adjacent uses to the highest degree possible. The amount of nighttime lights used along pathways and in parking areas would be minimized to the highest degree possible to ensure that spaces are not unnecessarily over-lit. For example, the amount of light can be reduced by limiting light posts to higher use areas and by using hooded wall mounts or bollard lighting on travel way portions of pathways.<br>Technologies to reduce light pollution evolve over time and design measures that are presently available may help, but may not be the most effective means of controlling light pollution once the hatchery is designed. Therefore, all design measures used to reduce light pollution would employ the technologies available at the time of hatchery design to allow for the highest potential reduction in light pollution, which would result in low impacts from glare caused by the new facilities.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Refer to Alternative 1 mitigation measure, *Reduce Glare from Buildings and Apply Minimum Lighting Standards,* described for the Crystal Spring hatchery.<br>*Reduce Visibility of the Security Fencing.* The following mitigation measures would reduce visibility of the security fencing associated with the proposed Yankee Fork and Panther Creek weir facilities:<br>● New fencing associated with the proposed weir facilities would be designed in a manner that allows these features to blend with the surrounding built and natural environments so that the new features complement the visual landscape.<br>● Any proposed fencing would be powder-coated and colored a shade that is two to three shades darker than the general surrounding area, such as a dark evergreen, black, or dark | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | brown color. These darker colors would allow fencing to recede into the visual landscape as much as possible and allow for more transparent views through the fencing. Light or bright colors would be avoided because such colors, including the grey stainless steel associated with standard chain link fencing, creates more of a visual barrier that pulls visual focus, is less transparent, and increases glare. Appropriate paint types would be selected for the finished material to ensure environmental safety and long-term durability of the painted surfaces. The appropriate operating agency or organization would maintain the paint color over time. Fencing would be managed and maintained for a well-kept appearance.<br>● Vandalism, graffiti, or damage would be abated semi-annually to maintain the effectiveness and attractiveness of the visual mitigation prescribed herein.<br>● Interpretive signage would be posted explaining the purpose and function of the facilities. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| Section 3.13, Noise | | |
| Construction | **Crystal Springs Hatchery, Yankee Fork and Panther Creek Weir Facilities**<br>The Tribes would implement the following best management practices to minimize noise levels associated with construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:<br>● Schedule construction work during daylight hours between 7:00 a.m. and 9:00 p.m.<br>● Locate stationary construction equipment as far away from noise-sensitive receptors as possible.<br>● Require sound-control devices that are at least as effective as those originally provided by the manufacturer on all construction equipment powered by gasoline or diesel engines.<br>● Select pumps and backup generators that do not generate excessively high noise levels. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand. No mitigation is recommended. |
| Operations | No mitigation is recommended for operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites. | No mitigation is recommended for operations at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site. |
| Section 3.14, Public Health and Safety | | |
| Construction | **Crystal Springs Hatchery, Yankee Fork and Panther Creek Weir Facilities**<br>To minimize safety risks on workers and the public during construction of the Crystal Springs hatchery and Yankee Fork and Panther Creek permanent weir facilities, the construction contractor would implement the following BMPs:<br>● Select appropriately qualified construction workers.<br>● Hold safety meetings with construction workers at the start of each work week to review potential safety issues and concerns.<br>● Ensure that construction workers comply with federal and state safety standards<br>● Attend monthly meetings with BPA and Tribal staff to discuss safety issues. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>No construction is proposed as the temporary weir facilities would be installed by hand. No mitigation is recommended. |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ● Restrict public access to active construction areas; exclude all unauthorized personnel from entry.<br>Construction activities at the Crystal Springs hatchery site would also require the use of diesel fuel, paints and solvents, and cement and asphalt. To avoid, minimize, or offset the risk of accidental spills, and ensure that any risk to public health and safety would be minimal, the construction contractor would implement the following measures:<br>● Obtain a National Pollutant Discharge Elimination System (NPDES) permit for construction activities prior to any ground-disturbing activities (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*).<br>● Implement a stormwater pollution prevention plan (SWPPP), which includes implementing a SPCC plan; both the SWPPP and the SPCC plan are required under the NPDES Permit.<br>● Prepare a Safety Plan in compliance with state requirements before starting construction. Specify how to manage hazardous materials, such as fuel and any hazardous 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 it as needed. | |
| Operations | **Crystal Springs Hatchery**<br>To minimize safety risks on Crystal Springs hatchery workers, the Tribes would implement the following BMPs:<br>● Hire appropriately qualified hatchery workers.<br>● Train staff in the proper use, transport, handling, and storage of all chemicals to minimize dangers of overexposure or accidental release to the environment.<br>● Ensure that hatchery workers comply with state and federal safety standards.<br>● Provide appropriate safety equipment.<br>● Store chemicals in areas designed to contain chemicals in the event of a leak or accidental spill. | **Crystal Springs Hatchery**<br>Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Implement the same mitigation recommended under Alternative 1 for the Yankee Fork and Panther Creek weir facilities. |

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| | During normal hatchery operations, chemicals and hazardous materials would be stored at the Crystal Springs hatchery in accordance with applicable state and federal regulations, and as described in Chapter 9, *Chemical Handling Protocols*, from the draft *Crystal Springs Hatchery Fish Culture Procedures Manual*. Implementing the measures listed below—which include proper labeling, storage in a separate chemical storage area, security, and proper training of staff for safety, handling, and spill cleanup response—would reduce the risk of accidental spills, resulting in minimal potential impact on public health and safety.<br>***Labeling***<br>● Label all containers. Include chemical name, formula, expiration date, storage requirements, and primary hazards.<br>● Ensure labels are colorfast and permanent.<br>● Replace labels if they become damaged or faded.<br>***Storage***<br>● Keep containers closed with threaded caps when not in use.<br>● Segregate incompatible chemicals by storing acids, bases, and flammable liquids in separate cabinets, and separating oxidizers, pure metals, and reactives from other compounds on shelves.<br>● Consult chemical supplier for suggested systems for chemical storage.<br>● Store chemicals so that labels are visible.<br>● Ensure chemicals are stored in appropriate storage cabinets.<br>● Store flammable liquids in certified flammable storage cabinets and acids in corrosion-resistant nonmetal cabinets.<br>● Store volatile chemicals requiring refrigeration in explosion-proof refrigerators. A spark from the thermostat or light switch in a traditional unit could be enough to set off volatile fumes from the chemical and cause an explosion.<br>● Store chemicals at or below eye level (but not on the floor).<br>● Never stack chemicals top of each other.<br>● Stock small quantities of chemicals. Small bottles are less likely to break than large ones. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | • Monitor the integrity of shelves. For example, are the chemicals too heavy for the shelf? Is the shelf sagging? Do the shelves show signs of wear? Are support clips corroded?<br>• Use secondary containment for liquids in storage to contain spills. Ensure the materials in a secondary container are compatible with each other and with the containment tub.<br>• Anchor storage cabinets to walls and doors so that earthquakes or other hazards do not topple cabinets.<br>• Monitor chemical containers to ensure container integrity remains intact. Signs of wear may include bulging, cracks, leaks, or rust.<br>• Monitor container tops for cracks, especially on bottles of nitric acid. Replace if degraded.<br>***Chemical Storage Area***<br>• Acid fumes can eat away at metals. Note corrosion residue below metal shelf holders.<br>• Label all containers. Include chemical name, formula, expiration date, storage requirements, and primary hazards.<br>• Monitor caps and replace when worn to prevent evaporation, leaks, and spills.<br>• Monitor volumes of chemicals. If chemical reductions are noted, this could be a sign of evaporation or theft.<br>• Monitor the stored chemicals for crystal buildup or formation of a liquid above a solid. These could indicate a leaking cap or the formation of potentially unstable and dangerous by-products.<br>• If hazardous potential is unknown, contact a local hazardous waste management company (i.e., look in the phone book under *Environmental Services*) or the State Communications Center, at (800) 632-8000, for assistance.<br>• Monitor expiration dates on chemicals. Use chemicals on a first-in, first-out basis to prevent accumulation of expired materials.<br>***Security***<br>• Lock chemical cabinets or storage rooms to prevent theft. | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | ● Restrict student access to chemical cabinets and storage rooms.<br>● Monitor chemical volumes. Unanticipated reductions in volume could be a sign of theft.<br>● Conduct routine inventories of chemicals and monitor wastes.<br>● Provide copies of updated chemical inventories to school management and the local fire station.<br>***Other***<br>● Ensure that staff is trained in the hazards of chemicals, spill cleanup response, and safety procedures.<br>● Have Material Safety Data Sheets on site for all chemicals.<br>● Purge unneeded, older chemicals yearly to prevent chemical stockpiles.<br>**Yankee Fork and Panther Creek Weir Facilities**<br>Several safety risks are associated with the trapping of fish at the Yankee Fork and Panther Creek permanent weir facilities. To ensure worker safety, the Tribes would implement the following risk minimization strategies associated with trapping fish:<br>● Upon being hired, Tribal staff would attend a swift-water rescue course through Idaho State University to become aware of common self-rescue and assisted rescue techniques.<br>● Tribal staff would be equipped with dry suits when performing instream tasks. Personal flotation devices are not needed because the water levels in Yankee Fork and Panther Creek are relatively low; the primary concern is cold water exposure.<br>● During normal operation of the Yankee Fork and Panther Creek weir facilities, potential hazardous chemicals such as formalin would be stored according to state and federal regulations as described above. Additional measures to minimize spills and exposure to hazardous chemicals would be similar to those described above for the Crystal Springs hatchery. These measures would ensure potentially hazardous materials are properly stored and used in a | |

| Environmental Resource | Alternative 1 | Alternative 2 |
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| | manner that reduces the risk of accidental spills and exposure. These measures also require a plan for a timely cleanup response should an accidental spill occur. | |

# Chapter 3
# Affected Environment and Environmental Consequences

This chapter discusses each environmental resource that would be affected by the Proposed Action and analyzes construction and operation impacts associated with the Crystal Springs Hatchery Program (Hatchery Program). One section has been prepared for each environmental resource, including land use and recreation, transportation, geology and soils, vegetation, groundwater and surface water quality and quantity, wetlands and floodplains, fish, wildlife, cultural resources, socioeconomics and environmental justice, air quality and climate change, visual quality, noise, and public health and safety (see Sections 3.1 through 3.14).

Construction and operation of the proposed Hatchery Program would cause direct, indirect, and cumulative impacts on each environmental resource. Direct impacts are those that are directly caused by the Hatchery Program. Indirect impacts are those that arise from a secondary action induced by the Hatchery Program. They usually occur later in time or are farther removed from the site. Cumulative impacts are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or individual performs them. Cumulative impacts could result from individually minor but collectively significant actions taking place over a period of time.

Each environmental resource section analyzes impacts that could occur as a result of each action alternative. The action alternatives are fully described in Chapter 2, *Alternatives, Including the Proposed Action.* Three alternatives are analyzed in this environmental impact statement (EIS): Alternative 1, Alternative 2, and the No Action Alternative. Under Alternative 1 (i.e., the Proposed Action), the Hatchery Program would construct and operate a fish hatchery at the Crystal Springs hatchery site, as well as install and operate permanent weir facilities at the Yankee Fork and Panther Creek sites. Under Alternative 2, the Hatchery Program is largely the same as Alternative 1, with the important difference that the weir facilities at Yankee Fork and Panther Creek would be temporary facilities (i.e., the weirs would be installed and removed seasonally). Under Alternative 1 and Alternative 2, a second production level is also analyzed, where production of Chinook salmon at the hatchery would be reduced by 50%. The third alternative is the No Action Alternative, and considers impacts that could occur if the Hatchery Program were not approved.

Each environmental resource section begins with a description of the analysis area, which differs for each resource, then describes current conditions (i.e., the affected environment) at each of three sites, including the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility. Current conditions take into account past and present actions, including:

- mining operations in the Blackbird Creek drainage (private entities);
- agricultural practices, including irrigation (private entities);
- recreational use of Yankee Fork and Panther Creek, such as kayaking, fishing, camping (private entities);
- Wild and Scenic Rivers eligibility determination for Yankee Fork and Panther Creek (USFS 1989);

- Fort Hall habitat restoration project (Shoshone-Bannock Tribes);
- Salmon River habitat restoration project (Shoshone-Bannock Tribes);
- Sawtooth Fish Hatchery (Idaho Department of Fish and Game);
- Snake River Steelhead Program (Idaho Department of Fish and Game);
- Springfield Fish Hatchery (Idaho Department of Fish and Game);
- Squaw Creek weir (Idaho Department of Fish and Game);
- Pahsimeroi Fish Hatchery (Idaho Power); and
- Lower Snake River Compensation Plan.

A discussion of impacts follows the description of current conditions. Each environmental resource section also describes mitigation measures that would be needed to address potentially significant impacts associated with constructing and operating Alternative 1 and Alternative 2.

This chapter also includes two sections that address unavoidable adverse effects of the Hatchery Program and associated irreversible and irretrievable commitments of resources (see Section 3.15), as well as associated short-term use of the environment and effects on long-term productivity (see Section 3.16).

Finally, this chapter concludes with a discussion of cumulative impacts that are described for each action alternative (see Section 3.17).

# 3.1 Land Use and Recreation

This section describes the affected environment and environmental consequences, including mitigation measures, associated with land use and recreation resulting from implementing Alternative 1, Alternative 2 and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the hatchery under two Chinook salmon production level options: the proposed production level and a 50% production level. This section also summarizes the federal Wild and Scenic Rivers Analysis presented in Appendix D for the free-flowing character and recreation outstandingly remarkable values (ORV), which are considered in the recreation affected environment and the environmental consequences analysis for both Yankee Fork and Panther Creek.

## 3.1.1 Affected Environment

The analysis area for land use encompasses the parcels where each facility would be located and adjacent parcels within 0.25 mile of each site. The analysis area for recreation includes an area broad enough to capture both direct impacts on recreational resources from the sites and resources that may serve as substitutes should impacts occur. This area extends 5 miles around the hatchery site and each weir facility. The analysis area for recreational fishing covers the recreational fisheries in the Salmon River watershed and downstream through the Columbia basin to the Pacific Ocean. It also includes the recreational fishing areas on the Fort Hall Indian Reservation where Yellowstone cutthroat trout would be released.

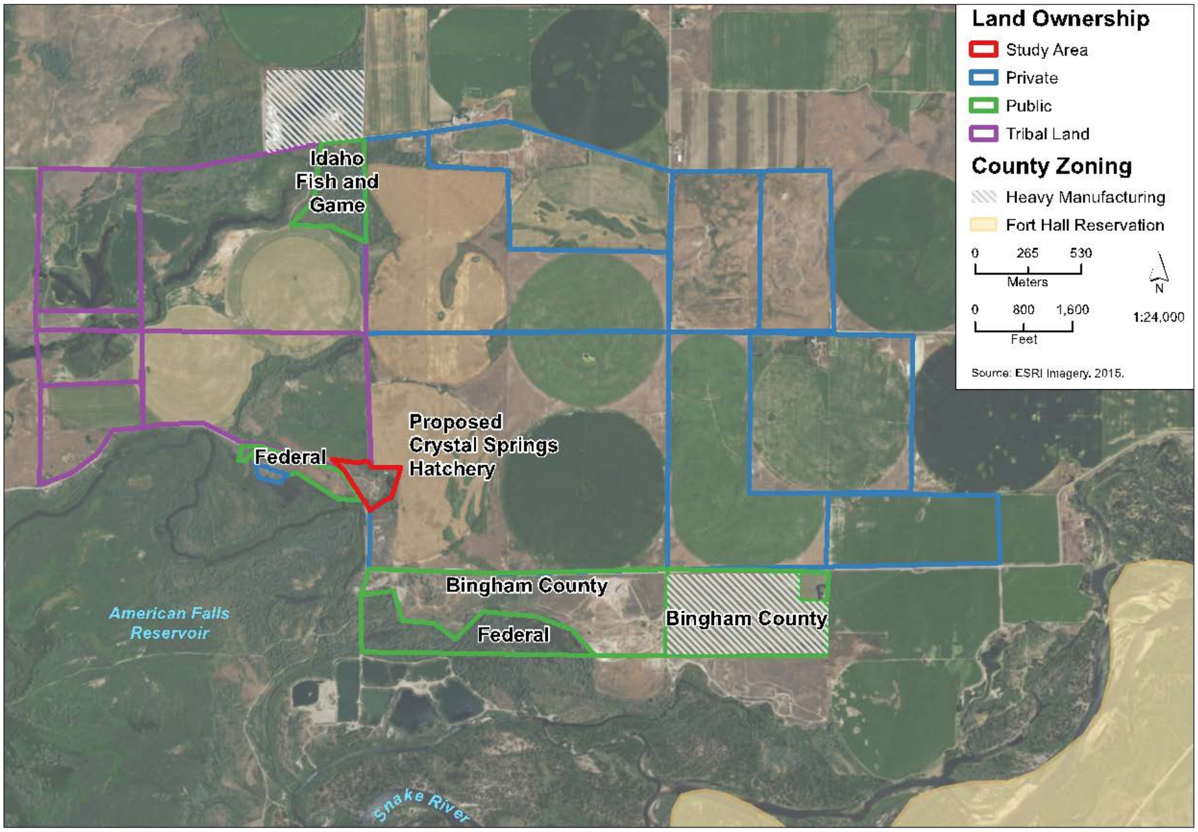
### 3.1.1.1 Crystal Springs Hatchery Site

#### Current Land Use and Zoning

Agriculture is Bingham County's dominant land use and the primary land use within the analysis area of the Crystal Springs hatchery site. Bingham County has zoned the site for agricultural use (L. Davis pers. comm.). Historically, the Crystal Springs hatchery site was a trout hatchery, and abandoned concrete ponds and raceways still occupy the eastern portion of the site. An irrigation pipeline supplying water to an adjacent private property runs across the property and a pump is located on the southern boundary of the property.

The Crystal Springs hatchery site abuts private land to the east, which is currently cultivated with center-pivot irrigation. The Shoshone-Bannock Tribes (Tribes) own the adjacent Legacy Springs parcel to the northwest. The adjacent parcel directly to the west is the "south parcel" owned by BPA, and the parcel to the southwest is federally owned and managed by the Bureau of Reclamation (Reclamation). Parcels within the 0.25-mile analysis area to the south include land owned by Bingham County and the federal government. Approximately 1 mile to the north of the Crystal Springs hatchery site is Idaho Department of Fish and Game's recently redeveloped Springfield Fish Hatchery. The 0.25-mile analysis area is shown in red in Figure 3.1-1.

**Figure 3.1-1. Map of Crystal Springs Hatchery Site and Adjacent Area**




Source: Google Maps, Bingham County Assessor and Zoning (Robertson pers. comm.), U.S. Census TIGER/Line (2013a), Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community.

## Recreation

The Crystal Springs hatchery site does not provide recreational facilities. The abandoned hatchery infrastructure is a local curiosity; however, no official recreation access is allowed (Stone pers. comm. 2015a).

The Crystal Springs hatchery site is located on the northeastern edge of American Falls Reservoir, which provides fishing, boating, and undeveloped camping opportunities. A Reclamation boat ramp is located approximately 0.5 mile to the south of the Crystal Springs hatchery site. Gravel ponds to the south of the site near McTucker Creek also offer fishing, boating, and camping opportunities (Bingham County 2015). Bingham County and Reclamation jointly manage this area. Visitation data are not available to describe how much use these areas receive each year.

Depending on reservoir pool levels, the northeastern part of the reservoir is often dry and serves as wildlife habitat, particularly for migratory birds, which draws bird watchers to the area. Idaho Department of Fish and Game identifies the area as the Springfield Bottoms on the Idaho Birding Trail (IDFG 2015a).

About 1 mile to the north of the Crystal Springs hatchery site is the Crystal Springs Pond fishing area, next to the Springfield Hatchery. The fishing area is open to the public year-round, and the hatchery has a visitor center open daily (IDFG 2015b).

South and east of the Crystal Springs hatchery site on the Fort Hall Indian Reservation are the Fort Hall Bottoms, a little known, high-quality fishing area managed by the Tribes (see, for example, Arellano 2015 and Evancho 2005). The Fort Hall Bottoms consist of wetlands and waterways, including Spring Creek, Jimmy Creek, Clear Creek, and sections of the Portneuf and Snake rivers (Wilderness Adventures Press 2008). Trout species currently present in the area include brown trout, rainbow trout, Yellowstone cutthroat trout, and rainbow/cutthroat hybrids. The area is open for recreational and subsistence fishing to Tribal members and by permit for non-Tribal members (Stone pers. comm. 2015a). Fishing for non-Tribal members is limited to catch-and-release during the season, which runs from May through October. In recent years, the Tribes have issued approximately 250 seasonal permits and 400 daily permits to non-Tribal members per year. Seasonal permits cost $250.00 and day permits cost $40.00, with a limit of six non-Tribal anglers allowed per day (Arellano 2015).

## 3.1.1.2 Yankee Fork Weir Facility

### Current Land Use and Zoning

Rural forest is the dominant land use in Custer County, and the primary land use within the analysis area of the Yankee Fork weir facility. The proposed site is located on the Salmon-Challis National Forest, within the Challis National Forest, Yankee Fork Management Area Number 6 (USFS 1987). The Yankee Fork Management Area is one of the larger management areas in the Salmon-Challis National Forest, encompassing the entire Yankee Fork of the Salmon River watershed. Current land uses in the unit include mining, recreation, grazing, and timber harvest (USFS 1987). The land uses within the 0.25-mile analysis area surrounding the Yankee Fork weir facility are consistent with the larger area.

The Yankee Fork weir facility would be located adjacent to U.S. Forest Service (USFS) Pole Flat Campground and Yankee Fork Road, a county road primarily used for recreational access to the National Forest. The site is located on the east side of the Yankee Fork, a tributary to the Salmon River. The Tribes currently set up a temporary weir in the river and use a clearing near the entrance to the Pole Flat Campground as a staging area for equipment and vehicles. There are no other landowners within the 0.25-mile analysis area. The proposed site for the Yankee Fork weir facility and adjacent area are shown in Figure 2-4.

Under the National Wild and Scenic River System, Yankee Fork is considered as eligible under the "Recreation" classification for Wild and Scenic Rivers (USFS 1989). Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad, and that may have some development along their shorelines or may have undergone some impoundment or diversion in the past. There are two eligible segments of the Yankee Fork relevant to this analysis. Segment A is the lower reach heading upstream from the mouth for 2 miles; Segment B is immediately upstream of Segment A, from the private land boundary upstream from the Pole Flat campground to Jordan Creek, approximately 6 miles in length. The Yankee Fork project area is located within Segment A, very near its boundary with Segment B.

## Recreation

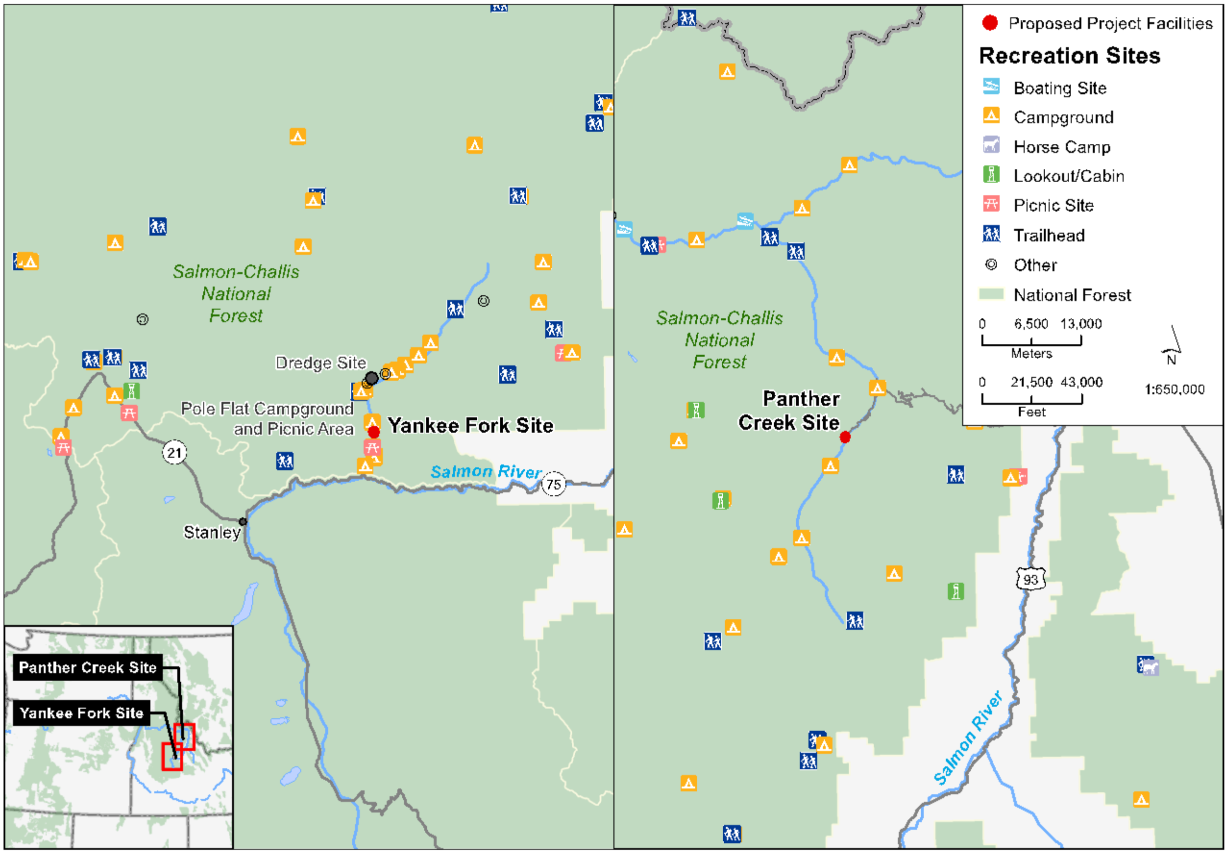
Recreation is an important use of the area immediately surrounding the Yankee Fork weir facility. Within the 5-mile analysis area surrounding the facility, there are 11 developed recreation sites. Most of these are located immediately off Yankee Fork Road, which serves as a primary access road into the Salmon-Challis National Forest. Table 3.1-1 shows the developed recreation sites within the analysis area. Figure 3.1-2 (left panel) shows the recreational resources within the analysis area and the broader region.

**Table 3.1-1. Recreational Facilities in the 5-mile Analysis Area for the Yankee-Fork Weir Facility**

| Facility Name | Facility Type | Number of Sites (Campgrounds) |
|---|---|---|
| Flat Rock Campground | Developed Campground | 6 |
| Flat Rock Extension Campground | Developed Campground | 3 |
| Pole Flat Campground | Developed Campground | 12 |
| Blind Creek Campground | Developed Campground | 7 |
| Bonanza Group Campground | Developed Group Campground | Reservation only |
| Jerry Creek Camping Area | Dispersed Camping Area | 3 (Dispersed) |
| Custer Townsite | Day Use Only | |
| Yankee Fork Dredge | Day Use Only | |
| Pole Flat Picnic Area | (Temporary facility, limited access) | |
| West Fork Trailhead | Trailhead | |

Source: Salmon-Challis National Forest GIS data and Salmon-Challis Visitor Guide (USFS n.d.)

**Figure 3.1-2. Map of Recreation Resources Proximate to Yankee Fork Weir Facility (left panel) and Panther Creek Weir Facility (right panel)**




Source: Google Maps, U.S. Census TIGER/Line (2013a), Idaho Department of Water Resources, United States Forest Service.

The area's campgrounds see heavy use throughout the summer season (typically June through September, although some operate on the shoulder months of May and October, and, weather permitting, some may be accessible through November), and are often at capacity on weekends (Callaghan pers. comm.). They are popular with anglers because of their proximity to the Yankee Fork.

In addition to these developed facilities, dispersed recreation occurs throughout the 5-mile analysis area. At least three dispersed camping areas are also located within the analysis area, along with a motorized ATV trail within 1 mile of the Yankee Fork weir facility (Callaghan pers. comm.).

Angling is a popular draw to the Yankee Fork area. Historical tourism is another attraction. Like many rivers in Idaho, the Yankee Fork was heavily mined throughout the last two centuries. The 5-mile analysis area includes some of the region's most popular historical interpretive sites: the ghost towns of Bonanza and Custer (both abandoned mining towns) and an abandoned mining dredge. USFS personnel and volunteers staff these sites during the summer season to provide educational and interpretive services. No data are available to estimate the annual visitation to the individual sites within the analysis area (Callaghan pers. comm.).

The Yankee Fork is also used by whitewater kayakers. The river can be run for 27 miles, from north of the Eleven Mile Canyon Recreation Area down to the confluence with the Salmon River. This reach includes the analysis area. It is used primarily in spring and early summer, until declining flows leave the river too rocky for boating (American Whitewater 2016a).

### 3.1.1.3 Panther Creek Weir Facility

#### Current Land Use and Zoning

Rural forest is the dominant land use in Lemhi County, and the primary land use within the analysis area of the Panther Creek weir facility. The proposed facility is located within the Salmon-Challis National Forest, Salmon-Cobalt Ranger District (USFS 1988). The Salmon-Cobalt Ranger District is the largest district in the Salmon-Challis National Forest. The district is relatively remote in relation to major population centers, and sees less recreational use than other parts of the Salmon-Challis National Forest. Recreation remains a dominant use, however, along with mining, grazing, and timber harvest (USFS 1988). The land uses within the 0.25-mile analysis area surrounding the Panther Creek weir facility are consistent with the larger area.

The Panther Creek weir facility is located on site within the Cobalt Work Center. USFS staff use the center during the summer months to coordinate field activities and forest fire response. There are approximately a dozen structures and a gravel parking lot associated with the work center, located on the west side of Panther Creek Road. A small bridge crosses Panther Creek at the center, providing access to a pasture on the east side of Panther Creek, a tributary to the Salmon River. The pasture is used for USFS livestock, primarily horses. There are no other landowners within the 0.25-mile analysis area. The proposed site for the Panther Creek weir facility and adjacent area are shown in Figure 2-8.

Under the National Wild and Scenic River System, Panther Creek is considered as eligible under the "Recreation" classification for Wild and Scenic Rivers (USFS 1989). The entire Panther Creek drainage (beginning at the mouth and extending 45 miles upstream) is considered eligible.

#### Recreation

The area surrounding the Panther Creek weir facility receives light-to-medium recreational use, which is less use than other parts of the Salmon-Challis National Forest because of its distance from population centers (USFS 1988). In addition to the Cobalt Work Center, two developed recreation areas are located within 5 miles of the Panther Creek weir facility:

- Deep Creek Campground—3 campsites
- McDonald Flat Campground—6 campsites

Dispersed recreation is allowed throughout the analysis area, including camping, hiking, and horseback riding. The map on the right side of Figure 3.1-2 (right panel) shows the recreational sites and uses in the Panther Creek weir facility analysis area. No data are available to estimate the annual visitation to the sites within the analysis area (Callaghan pers. comm.).

Panther Creek is also used by whitewater kayakers; however, they primarily run the river from Trapper Flat, approximately 7 miles downstream of the proposed Panther Creek weir facility (American Whitewater 2016b). Boating is not expected to be a recreational use of the river in the vicinity of the proposed facility.

## 3.1.2 Environmental Consequences

For the purposes of this analysis, the Hatchery Program would have direct and indirect impacts if it generated any of these effects:

- Inconsistency with state or local land use regulations.
- Incompatibility with the land use(s) of adjacent parcels.
- Directly or indirectly causes temporary or permanent change of the supply of recreational resources within the analysis area, through loss of access, reduction in quality, or other mechanism.
- Directly or indirectly causes temporary or permanent change in demand for recreational resources within the analysis area
- Directly affects the river's "free-flowing" nature—a natural condition without impoundment, diversion, rip-rapping, or other modifications of the waterway.

These effects are described in detail below; additional detail is provided in the Wild and Scenic River Section 7 Analysis (Appendix D).

### 3.1.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

**Construction**

***Land Use***

Construction of the Crystal Springs hatchery facilities would change the existing land-use conditions on the parcel by increasing the developed area and number of structures, resulting in a more developed site. Alternative 1 would be a conforming use under Bingham County's zoning ordinance (Bingham County 2012). The parcel is zoned agricultural, which allows for fish hatcheries and associated infrastructure, as well as residential single-family dwellings.

Alternative 1 is unlikely to affect existing land uses on adjacent parcels in the analysis area, and would not result in the conversion of current land uses in the analysis area to other uses. Although there may be minor disruptions to the rural character of the landscape during construction, there would be no long-term access or use limitations for landowners in the analysis area. During construction, the existing irrigation pipeline would be rerouted to an easement on the edge of the property, and no service disruptions during irrigation season would occur. Short-term **low** impact on the rural character is expected to occur during construction. Because the project would conform to local zoning ordinances and would increase the number and size of existing facilities in a minor way, there would be **low to no** long-term impacts on land use under Alternative 1.

***Recreation***

Alternative 1 is unlikely to adversely affect the supply of recreational facilities in the analysis area. During construction, minor disruptions from construction noise and traffic may have a short-term, **low** impact on the quality of some recreational opportunities for some visitors. These impacts are unlikely to reach beyond the immediate vicinity of the parcel, where the primary activities affected would be bird watching, dispersed camping, and boating at the gravel ponds near McTucker Creek. Long-term, there would be **no** impact on recreation once construction is complete.

### Operations

#### *Land Use*

Operations under Alternative 1 would not affect the use of adjacent parcels and would result in **low** impacts on the rural character of the landscape arising from the minor increase in development of the site.

#### *Recreation*

The Crystal Springs hatchery facility would have a visitor viewing area, which would include a kiosk with interpretive signage that explains the Hatchery Program to visitors. It would also have the capacity to accept scheduled visits from the public. These features would result in a long-term increase in the supply of and the recreational experience for visitors to the area, a **low** beneficial impact on recreation. Alternative 1 would generate beneficial impacts on recreational fisheries in the Fort Hall Bottoms, by providing a supply of Yellowstone cutthroat trout that the Tribes would use to enhance fishing opportunities. Alternative 1 would likely not increase the number of permits the Tribes offer to non-Tribal anglers each year, so it would not have a direct effect on the total quantity of fishing opportunities—especially for non-Tribal anglers—available in the Fort Hall Bottoms. However, for Tribal and non-Tribal anglers who have the opportunity to fish the Fort Hall Bottoms, Alternative 1 would have the potential to improve the quality of the experience in two ways: the increased fish population would potentially increase the catch-per-unit-effort in areas where Yellowstone cutthroat trout are planted and where native populations are established, and it would increase the diversity of fish caught. The Tribes would install interpretive signage where fish are introduced, which would promote awareness about the importance of Yellowstone cutthroat trout, increasing the likelihood that anglers would recognize and enjoy the opportunity to catch this sensitive species. The increase in Yellowstone cutthroat trout population and increase in awareness of the species by recreationists near the hatchery would result in a long-term, **low** beneficial impact on recreation. See Section 3.10, *Socioeconomics and Environmental Justice*, for a discussion of the economic value associated with the Hatchery Program's effects on Yellowstone cutthroat trout fisheries.

Alternative 1 would also generate beneficial impacts on recreational spring/summer Chinook salmon fisheries throughout their range. The effect would be most noticeable in the Upper Salmon River basin, where existing fishing opportunities for spring/summer Chinook salmon are limited. Alternative 1 would increase the quality of recreational angling in the Upper Salmon basin primarily by increasing the catch-per-unit-effort, leading to higher satisfaction among anglers. This may, in turn, increase the quantity of anglers who fish the Upper Salmon basin, although the extent to which this would be a net increase in angling is unknown, because anglers may decide to go to the Upper Salmon instead of somewhere else. Increased opportunity for anglers who fish in the Upper Salmon basin would result in a long-term, **low** beneficial impact on recreation. Table 3.10-13 in Section 3.10, *Socioeconomics and Environmental Justice*, describes the expected increase in fishing opportunity from Alternative 1, and the economic value associated with the increase.

## Yankee Fork Weir Facility

### Construction

#### *Land Use*

Construction of the Yankee Fork weir facility would change the existing land-use conditions by developing permanent structures in Yankee Fork and on the land between Yankee Fork and the Pole Flat Campground. Construction activities would involve realigning the existing road to make room for the structures on the same side of the road as the river. Alternative 1 would need a special use permit from USFS to construct and operate. Alternative 1 is not explicitly identified in the Challis National Forest Land and Resource Management Plan (LRMP); however, the Challis National Forest LRMP does not disallow the uses that would occur during construction or operation of the Yankee Fork weir facility (USFS 1987; USFS 2004a). Construction of the weir facilities at Yankee Fork would temporarily affect surrounding areas, a short-term, **low** impact on land use.

#### *Recreation*

Construction of Alternative 1 would temporarily disturb recreation use at the Pole Flat Campground. Construction would likely coincide, at least in part, with the summer fishing season and the spring/summer kayaking season. Several construction activities may disrupt recreational access temporarily, or reduce the quality of recreation visitors enjoy:

- Realignment of the road at the entrance to the Pole Flat Campground may reduce access to the facility.
- Removal, salvage, and relocation of some of the facilities in the Pole Flat Campground, such as signage and picnic tables, may temporarily impede access to or reduce use of the facility.
- Noise from construction may disrupt the enjoyment recreation users experience from rural, natural surroundings, both in the campground and in areas near the construction site.
- Diversion of the river during weir construction would prevent kayaking the affected portion of the river, necessitating kayakers to carry their watercraft around the area of construction.

Although current plans indicate the Pole Flat Campground likely would remain open during construction, customary users of the Pole Flat Campground may decide to go elsewhere for recreation during construction to avoid increased noise and disruption. They may choose to stay at other campgrounds in the 5-mile analysis area, beyond the analysis area on Yankee Fork Road, or elsewhere in the Salmon-Challis National Forest. If users relocate to other campgrounds within the analysis area, they may displace other customary users or increase the amount of time these other campgrounds operate at capacity. Construction of weir facilities at Yankee Fork would result in a short-term **moderate** impact on Pole Flat Campground users who might be disrupted or displaced. Kayakers within the immediate vicinity of the construction area would experience a short-term, **moderate** impact on their use of the river while portaging around the construction area.

### Operations

During operation, permanent features in the water and adjacent to the Yankee Fork Road and Pole Flat Campground may detract from the area's natural character, potentially lowering the quality of recreation for some users. Alternative 1 would likely not reduce the quantity of recreation available in the analysis area, but if some users decide to go elsewhere, the quality of their recreation experience may diminish if they have to travel farther or go to a site they enjoy less. Kayakers using the river during facilities operations would need to stop and carry their watercraft around the weir structure. The facilities at Yankee Fork would result in a long-term **moderate** impact on Pole Flat Campground users who might experience less recreational enjoyment with permanent features in the water. Kayakers would experience a short-term, **moderate** impact on their use of the river while portaging around the facility during operations.

Operation of Alternative 1 would have beneficial impacts on recreation to the extent that it would improve fishing opportunities for Tribal and non-Tribal anglers fishing for spring/summer Chinook salmon on the Yankee Fork. The increase in value of the recreational fishery is discussed in detail in Section 3.10, *Socioeconomics and Environmental Justice*. The Yankee Fork weir facility would have the capacity to accept scheduled visits from the public and would include an interpretive kiosk explaining the Hatchery Program, potentially enriching the recreational experience for visitors to the area. Improved fishing opportunities and the addition of public interpretive information would result in a long-term, **low** beneficial impact on recreation.

#### Wild and Scenic Rivers Act

##### *Free-Flowing Character*

Section 2(b) of the Wild and Scenic Rivers Act (P.L. 90-542) requires that all rivers considered eligible for designation need to be free-flowing. Section 15 (b) defines a “free-flowing” river as one which is in a “natural condition” and without impoundment, diversion, rip-rapping, or other modifications of the waterway. It also states that existence of low dams, diversion works, and other minor structures shall not automatically bar its consideration, though such construction is discouraged.

In the Challis National Forest’s 1989 Wild and Scenic Rivers Evaluation Report (USFS 1989), Segment A was evaluated to be free-flowing in a natural condition for its entire length and that it contained one bridge. The report also stated that Segment B was in question as to whether it met the intent of “free flowing in a natural condition” because the effects of past dredging activities that re-routed the river and changed its width, depth, banks, and slope from its natural condition. The presence of this condition did not prevent the Challis National Forest from finding both segments of the Yankee Fork eligible for Wild and Scenic River status in the “Recreation” classification. The “Recreation” classification allows for rivers that have undergone some impoundment or diversion in the past (16 USC §1273 (b) (3)).

The Wild and Scenic Rivers Act allows for “minor structures at the time a river is proposed for inclusion in the Wild and Scenic River System.” While the Yankee Fork segments have not been formally proposed for designation, nor has a suitability determination been made (which must precede a proposal), the scale of the structures considered under Alternative 1 is consistent with the scale of structures discussed as being allowable for rivers proposed for designation under the “Recreation” category (USFS 1992). Although there would be some impact on the free flowing character of the river during operations, a permanent weir would not affect the potential for Wild and Scenic Rivers designation or eligibility, a **low** impact.

##### *Recreation ORV*

While Alternative 1 would not change the flow of the river downstream from the facility, and recreation opportunities dependent on the river flow such as fishing, kayaking, and swimming would not be affected below the Yankee Fork weir facility, construction and operational activities at the weir facility would affect the recreation ORV for Segment A as follows:

- Temporary impacts on the free-flowing nature of the river during weir operation.
- The footprint of the permanent structure would reduce the amount of river frontage for user access near the Pole Flat Campground, and would double the distance kayakers and boaters must travel from the campground parking area to a launch point below the weir.
- The weir would create a barrier around which river users would need to portage.
- Alternative 1 would result in the construction of an industrial-appearing facility within a natural-appearing landscape.

Impact ratings for the Wild and Scenic Rivers recreation ORV are discussed in further detail in Appendix D: Wild and Scenic Rivers Analysis.

## Panther Creek Weir Facility

### Construction

#### *Land Use*

Construction of the Panther Creek weir facilities would change existing land-use conditions by developing permanent structures in and adjacent to Panther Creek. These changes to the landscape likely would be **low** impact, considering the development that is already present at the site. Alternative 1 would need a special-use permit from USFS to construct and operate. Alternative 1 is not explicitly identified in the Salmon National Forest LRMP, and the Salmon National Forest LRMP does not explicitly disallow the uses that would occur during construction or operation of the Panther Creek weir facility (USFS 1988; USFS 2004b). This impact on land use is considered **moderate**.

#### *Recreation*

Panther Creek Road would be closed to through traffic for up to several weeks during construction, disrupting recreational traffic traveling through the area. Recreational users may have to use alternate routes to access recreational facilities on Panther Creek Road during the road closure. All recreational sites in the region would remain accessible even during road closures, but travel time to the sites may increase depending on how recreational users customarily access the sites and available alternate routes. The increase in travel time would not hinder overall access to recreation facilities along Panther Creek Road, which would be a **moderate** impact. This impact on recreation users is considered **moderate** and is discussed in more detail in Section 3.2, *Transportation*. Although the construction area is not a popular stretch of river for boating, any kayakers within the immediate vicinity would be required to portage around the construction area. Given the limited use of the river for this purpose, this would constitute a **low** impact for recreational boaters.

### Operations

Operation of Alternative 1 would have **low** beneficial impacts on recreation to the extent that it would improve fishing opportunities for Tribal and non-Tribal anglers fishing for spring/summer Chinook salmon on Panther Creek. The increase in value of the recreational fishery is discussed in detail in Section 3.10, *Socioeconomics and Environmental Justice*. The Panther Creek weir facility would have the capacity to accept scheduled visits from the public and would include an interpretive kiosk explaining the Hatchery Program, potentially enriching the recreational experience for visitors to the area. An increase in fishing opportunities and the availability of interpretive information for recreation users would result in long-term **low** beneficial impacts on recreation in the area. Kayakers would experience a short-term, **low** impact on their use of the river while portaging around the facility during operations.

### Wild and Scenic Rivers Act

#### *Free-Flowing Character*

In the Salmon National Forest's 1993 Wild and Scenic Rivers Evaluation, Panther Creek was evaluated to be free-flowing in a natural condition for its entire length. Although infrastructure developments (e.g. bridge crossings) have been installed since that time, there are no impoundments or major dewatering diversions that substantially alter the river's flow. Panther Creek Road, located in the river valley bottom and extending almost the entire length of Panther Creek, has encroached on the floodplain and in some areas the road is flooded during high-flow events. This encroachment has resulted in reduced capacity for flood flows and a reduction in riparian vegetation and stream cover (USFS 2008). This condition was present during the 1993 evaluation, and the USFS determined it did not compromise the free-flowing character of the creek. Today Panther Creek retains the same free-flowing characteristics as it did in 1993.

Alternative 1 would divert approximately 10 cubic feet per second (cfs) of water from Panther Creek from June through September to support the adult holding ponds, and 3 cfs from April through June to support the acclimation ponds. This water would be diverted approximately 0.125 mile above the acclimation ponds, flow through the facility and returned to the river through the fish ladder at the weir, for a total diversion length of about 0.25 mile.

Panther Creek flows at approximately 300 cfs in early June and drops to about 35 cfs by mid-September. The impact of 10 cfs in early June is minimal, but the effect by September is the removal of nearly one-third the water for a 0.25-mile stretch of the river. Alternative 1 includes plans for supplementation of 1 cfs from Dummy Creek during August and September for temperature regulation purposes, reducing this impact. Between 20 and 30% of the flow would be drawn from Panther Creek from mid-August through September, when stream temperatures are likely a concern in the 0.25-mile stretch affected.

The project would not change the free-flowing character of the river downstream or upsteam from the facility. There are no impoundments, and no straightening or redirection of the river. There is, however, the introduction of abutments on each riverbank, and a narrow slab across the riverbed with temporary/removable screening sufficient to trap fish during migration periods. The expectation is that the weir would be operating (blocking fish passage) from June through September. It would not be blocking river passage by fish year-long. Although there would be some impact on the free flowing character of the river during operations, a permanent weir would not affect the potential for Wild and Scenic Rivers designation or eligibility, a **low** impact.

***Recreation ORV***

Impacts on the recreation ORV would be limited to the immediate vicinity of the proposed Panther Creek weir facility. They are as follows:

- Activities depending on river flow such as fishing and swimming within the 0.25 mile between the diversion's intake and weir would be affected during late summer due to timing of operations.
- While kayaking and rafting is likely an uncommon recreational pursuit in this reach, limited to those times of year with adequate flow, the weir would create a barrier around which river users would need to portage.
- Alternative 1 would result in the construction of an industrial-appearing facility within a natural-appearing landscape.
- Withdrawing 20 and 30% of the flow from Panther Creek from mid-August through September, when stream temperatures are likely a concern in the 0.25-mile stretch affected.

Impact ratings for the Wild and Scenic Rivers recreation ORV are discussed in further detail in Appendix D: Wild and Scenic Rivers Analysis.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Similar to full production, construction impacts on local land uses would be a short-term nuisance caused by noise and dust, constituting a **low** impact. Although a short-term **low** impact on the rural character is expected to occur, there would be **no** long-term adverse impacts on land use and recreation during construction.

Although production of Chinook salmon would be reduced by 50%, operational impacts on land use and recreation would be essentially the same as that described for full production under Alternative 1. Operations would not affect use of adjacent land parcels, and recreational opportunities would be enhanced by the new hatchery. Similar to full production, land use and recreational impacts related to hatchery operations would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 1. Similar to full production, construction would affect recreational use of the Pole Flat Campground at the Yankee Fork site, and the closure of Panther Creek road during construction would affect recreational users in the area. In addition, kayakers using Yankee Fork and Panther Creek would need to portage their kayaks around the construction site. These impacts would be **moderate**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1.

As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operate for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, operation of the weir facilities would affect recreational use of the Pole Flat Campground at the Yankee Fork site, and kayakers using Yankee Fork and Panther Creek would need to portage their kayaks around the new weir facilities. These impacts would be **moderate**. However, the Hatchery Program would also improve fishing opportunities for Tribal and non-Tribal anglers fishing in both Yankee Fork and Panther Creek, which would result in a **low** beneficial impact on recreation.

## 3.1.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with land use and recreation at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

#### Construction

No construction is proposed as the temporary weir facility at Yankee Fork would be installed by hand.

#### Operations

##### *Land Use*

Under Alternative 2, the Tribes would continue to use the existing temporary weir, and not install permanent features in Yankee Fork or adjacent to the Pole Creek Campground. The existing land-use character would persist, with only temporary disturbance to the Yankee Fork and disruptions at the staging area outside the Pole Flat Campground when the temporary weir is in place from June to September. This impact on land use is considered **low**.

##### *Recreation*

Alternative 2 would minimize disruption to recreational users by eliminating the need for a construction period and reducing impacts on campground users. However, this alternative would designate a temporary campsite for Tribal use during the period the Tribes operate the temporary weir, from June through September. This is the busiest time for the campground, and use of this campsite would sometimes displace customary users of the Pole Flat Campground, especially if it is permanently reserved and unavailable on weekends. Kayakers using the river during facilities operations would need to stop and carry their watercraft around the temporary weir. Alternative 2 would result in a long-term **moderate** impact on recreation users at Pole Flat Campground who may be displaced or disrupted during peak usage months.

Operation under Alternative 2 would also have beneficial impacts on recreation to the extent that it improves fishing opportunities for Tribal and non-Tribal anglers fishing for spring/summer Chinook salmon on the Yankee Fork. Improved fishing opportunities and the addition of public interpretive information would result in long-term, **low** beneficial impacts on recreation. The increase in value of the recreational fishery is discussed in detail in Section 3.10, *Socioeconomics and Environmental Justice*.

#### Wild and Scenic Rivers Act

##### *Free-Flowing Character*

Under Alternative 2, the Tribes would continue to use the existing temporary weir, and not install permanent features in Yankee Fork or adjacent to the Pole Creek Campground. The operation of the weir would continue to temporarily interrupt Yankee Fork's free-flowing characteristics during the trapping season; however, the weir could be removed with no major disturbance to the river's bed or banks, and would continue to not constitute a feature that eliminates the river's continued eligibility for potential future designation as a Wild and Scenic River, a **low** impact.

##### *Recreation ORV*

Operations under Alternative 2 would continue to result in temporary impacts on the free-flowing nature of the river during weir operation. Since there would be no change to the weir footprint, the distance kayakers and boaters must travel from the campground parking area to the launch point below the weir would remain the same as it is today. When in use, the temporary weir would create a barrier around which river users would need to portage. Impact ratings for the Wild and Scenic Rivers recreation ORV are discussed in further detail in Appendix D: Wild and Scenic Rivers Analysis.

### Panther Creek Weir Facility

#### Construction

No construction is proposed as the temporary weir facility at Panther Creek would be installed by hand.

#### Operations

##### *Land Use*

Under Alternative 2, the Tribes would not install permanent features in Panther Creek or at the USFS Cobalt Work Center. The existing land-use character would persist, with only temporary disturbance to Panther Creek when the temporary weir is in place from June to September. This impact on land use is considered **low**.

##### *Recreation*

Alternative 2 would minimize conflict with existing recreational vehicle traffic by eliminating the need for construction. Operation of Alternative 2 would have beneficial impacts on recreation to the extent that it improves fishing opportunities for Tribal and non-Tribal anglers fishing for spring/summer Chinook salmon on Panther Creek. Improved fishing opportunities and the addition of public interpretive information would result in a long-term, **low** beneficial impact on recreation. The increase in value of the recreational fishery is discussed in detail in Section 3.10, *Socioeconomics and Environmental Justice*. Kayakers using the river during facilities operations would need to stop and carry their watercraft around the temporary weir, resulting in a **low** impact.

### Wild and Scenic Rivers Act

#### *Free-Flowing Character*

Under Alternative 2, the Tribes would install a temporary weir. The operation of the weir would continue to temporarily interrupt Panther Creek's free-flowing characteristics during the trapping season; however, the weir could be removed with no major disturbance to the river's bed or banks, and would continue to not constitute a feature that eliminates the river's continued eligibility for potential future designation as a Wild and Scenic River, a **low** impact.

#### *Recreation ORV*

Construction and operations under Alternative 2 would result in temporary impacts on the free-flowing nature of the river, limited to the 0.25-mile area between the diversion's intake and weir, during late summer when the weir would be in use. Impacts on kayakers and boaters would be the same as under Alternative 1, as would visible impacts of water withdrawal from Panther Creek. Impact ratings for the Wild and Scenic Rivers recreation ORV are discussed in further detail in Appendix D: Wild and Scenic Rivers Analysis.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

Impacts related to construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weirs at the Yankee Fork and Panther Creek sites. As a result, there would be **no** construction-related impacts on land use and recreation.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as for full production under Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operate for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, operation of the weir facilities would affect recreational use of the Pole Flat Campground at the Yankee Fork site, and kayakers using Yankee Fork and Panther Creek would need to portage their kayaks around the new weir facilities. These impacts would be **moderate**. However, the Hatchery Program would also improve fishing opportunities for Tribal and non-Tribal anglers fishing in both Yankee Fork and Panther Creek, which would result in a **low** beneficial impact on recreation.

# 3.1.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on land use and recreation during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.1.3.1 Alternative 1: Hatchery Program with Permanent Weirs

### Construction

#### Crystal Springs Hatchery Site

Mitigation would not be required during construction of the Crystal Springs hatchery.

#### Yankee Fork Weir Facility

Minimize disruption and adverse impacts on the customary users of the Pole Flat Campground and picnic area near Yankee Fork weir facility during construction by implementing the following measures:

- Coordinate with USFS staff to ensure access to the campground is maintained for as much time as is possible and reasonably safe. Consult with USFS to determine if temporary closure would be less disruptive.
- If facilities are temporarily or permanently relocated, signage for new or alternate facilities should be clearly posted.
- Coordinate with USFS staff to schedule construction activities to coincide with lower-use periods during the recreational season (e.g., on weekdays, or during less favorable fishing and boating conditions).
- Coordinate with USFS staff to minimize noise and visual disruption to recreational users by efficiently scheduling construction activities and staging work areas away from recreational areas to the greatest extent possible.
- Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of in-water construction and provide portage instructions and facilities (e.g., a portage trail).

#### Panther Creek Weir Facility

Use temporary signage to warn vehicles traveling through the area of increased construction traffic near the Panther Creek site under Alternative 1. See Section 3.2, *Transportation*, for additional mitigation measures to address safety concerns and road closure on Panther Creek Road.

Coordinate with USFS staff to determine if signage or other measures are necessary to warn boaters on Panther Creek of in-water construction. Implement safety measures as needed.

### Operations

#### Crystal Springs Hatchery Site

Mitigation would not be required during operation of the Crystal Springs hatchery.

#### Yankee Fork Weir Facility

Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of the presence and seasonal use of the weir, as well as provide portage instructions and facilities (e.g., a portage trail).

#### Panther Creek Weir Facility

Coordinate with USFS staff to determine if signage or other measures are necessary to warn boaters on Panther Creek of the seasonal use of in-water weir facilities. Implement safety measures as needed.

## 3.1.3.2 Alternative 2: Hatchery Program with Temporary Weirs

### Construction

#### Crystal Springs Hatchery Site

Mitigation would not be required during construction of the Crystal Springs hatchery.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed as the temporary weir facilities would be installed by hand; mitigation would not be required.

### Operations

#### Crystal Springs Hatchery Site

Mitigation would not be required during operation of the Crystal Springs hatchery.

#### Yankee Fork Weir Facility

Coordinate with USFS staff to identify ways to offset occupation of campsites at Pole Flat Campground if permanent reservation is required, or minimize temporary occupation of campsites during periods of high demand.

Coordinate with USFS staff to provide signage that warns boaters on the Yankee Fork of the seasonal use of the weir and provide portage instructions.

#### Panther Creek Weir Facility

Implement the same mitigation recommended under Alternative 1 for the Panther Creek weir facility.

# 3.1.4 No Action Alternative

If the Hatchery Program were not implemented, the current conditions on the parcel where the Crystal Springs hatchery facility would be built would not change dramatically. The abandoned hatchery ponds and other structures would remain and continue to deteriorate, potentially continuing to attract local interest. The parcel would otherwise remain consistent with the rural character of the landscape.

Under the No Action Alternative, anglers would continue to experience sub-optimal fishing conditions in the Fort Hall Bottoms and the Upper Salmon basin. In the Fort Hall Bottoms, Tribal and non-Tribal anglers would have more limited opportunities to catch Yellowstone cutthroat trout. In the Upper Salmon basin, spring/summer Chinook salmon returns would fluctuate from year to year at relatively low levels, potentially increasing slowly as other fisheries' enhancement projects elsewhere in the basin improve conditions for spring/summer Chinook salmon throughout their range. This would result in a **low** impact on land use and recreation.

If the Hatchery Program were not implemented at Yankee Fork, current activities may or may not continue, depending on USFS's decision to continue allowing the activities associated with the Yankee Fork Chinook Salmon Supplementation Strategy. If they are not allowed to continue, the long-term status of spring/summer Chinook salmon populations in Yankee Fork would be uncertain, putting in jeopardy the recreational opportunities currently associated with Yankee Fork spring/summer Chinook salmon. This would result in a **low** impact on land use and recreation.

If the Hatchery Program were not implemented at Panther Creek, no increase in spring/summer Chinook salmon populations in Panther Creek would occur in the same timeframe as expected under Alternative 1 or Alternative 2. No increase in associated recreational opportunities would occur at Panther Creek in the short run, although angling quality may increase as a result of natural improvement or other fishery enhancement projects in the Upper Salmon watershed. This would result in a **low** impact on land use and recreation.

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# 3.2 Transportation

This section describes the affected environment and environmental consequences, including mitigation measures, associated with transportation resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level and a 50% production level.

## 3.2.1 Affected Environment

The analysis area includes the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site; the roads within the vicinity of the sites; and regions that include road users who may not live near the sites, but would nonetheless be affected by changes in their access to the affected roads and the destinations serviced by those roads.

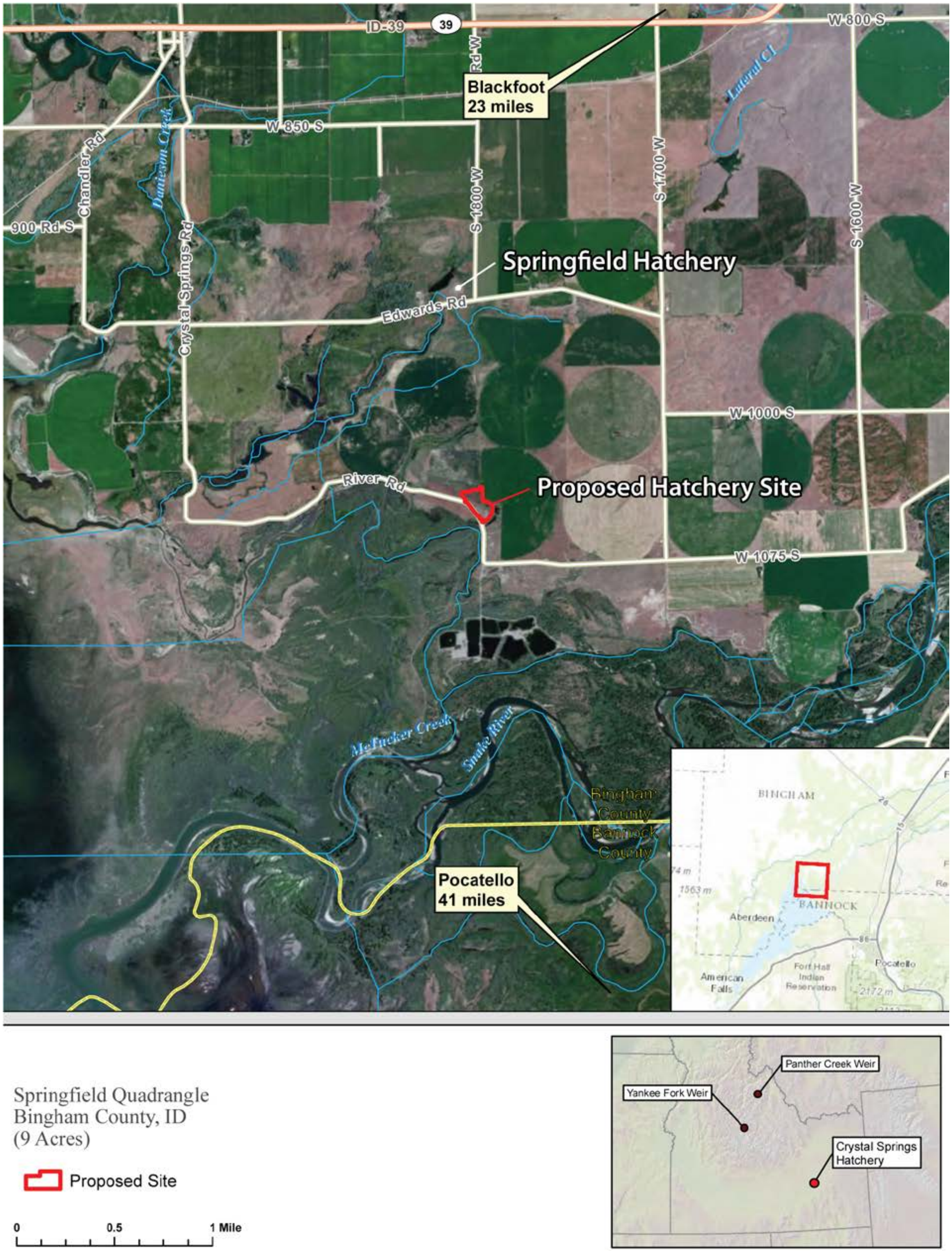
### 3.2.1.1 Crystal Springs Hatchery Site

The parcel where the proposed Crystal Springs hatchery would be located is near the north end of the American Falls Reservoir, in Bingham County. By car, the closest town is Blackfoot (population: about 12,000), which is about 23 miles, or a 30-minute drive, from the Crystal Springs hatchery. The larger town of Pocatello (population: about 54,000) is about 41 miles away, or a 50-minute drive (U.S. Census Bureau 2010). Figure 3.2-1 shows the proposed Crystal Springs hatchery site location.

The 10.7-acre site sits off of River Road, about 5 miles south of Highway 39. Two primary uses motivate people to pass along this road: access to the adjacent properties and access to the American Falls Reservoir's recreation opportunities. The site abuts Tribal, private, county, and federal sites, and farther down the road is an access point to the McTucker Ponds and American Falls Reservoir. The McTucker Ponds are about 0.5 mile south of the hatchery site, and serve as a place for people to visit, to fish, spend time outdoors, and camp. The facility includes a campground with restrooms (IDFG 2015c). Similarly, an access point to American Falls Reservoir past the Crystal Springs hatchery site provides access to the water for fishing, boating, and wildlife viewing. Both of these sites can be accessed without passing the Crystal Springs hatchery site. If drivers needed to access either of these points from the other side of the site, they would be able to because two roads—Edwards Road and Steclein Road—go around the site. However, for drivers who prefer to take a route that goes by the site, construction work has the potential to impose delays.

While traffic counts at the hatchery site itself are not available, Bingham County does provide counts for recent years at nearby roads. Traffic counts in the area south of Highway 39 recorded average daily vehicles in the range of 26 to 81 between 2009 and 2011 (Jensen pers. comm.). Only about 10 to 20 vehicles pass the Crystal Springs hatchery site on a typical summer day (Monson pers. comm.).

**Figure 3.2-1. Proposed Crystal Springs Hatchery Site**



Bingham County maintains River Road where the Crystal Springs hatchery site is located. Bingham County would not require special permits for the types of trucks involved in construction of the Crystal Springs hatchery and would not expect that any traffic-related permitting would be needed for this site. Bingham County staff indicated that they may consider requiring construction-related traffic to access the site through the least-disruptive route; however, Bingham County does not yet have any plans to implement this (Monson pers. comm.).

#### 3.2.1.2 Yankee Fork Weir Facility

The Yankee Fork weir facility is on Yankee Fork Road, north of Highway 75. The proposed Yankee Fork weir facility location is shown in Figure 3.2-2. Yankee Fork Road has two lanes along the site. The town of Stanley (population: about 60) is about 16 miles or 30 minutes away by car. The town of Challis (population: about 1,100) is about 57 miles or an hour away by car (U.S. Census Bureau 2010). The Redfish Lake Lodge is about 22 miles or a 40-minute drive away.

The proposed site is adjacent to the Yankee Fork and near the Pole Flat Campground. The road is paved along its distance from Highway 75 through the site, and then becomes gravel only a short distance north of the site. Custer County took over maintenance of the road in 2012 (Lanier pers. comm.).

The site currently hosts a temporary weir and field station. Additionally, the Pole Flat Campground sits on the east side of the road, opposite the Yankee Fork; campers and workers at the temporary weir must cross the road to access the river.

Road usage is highest in the summer, when tourists use Yankee Fork Road to explore the mountains. Additionally, Yankee Fork Road is the primary access for seasonal and permanent residences, and for mines in the forest, such as the Hecla Mine and the Custer Historic Mining Town (i.e., Custer Townsite). While Custer County does not record traffic counts for Yankee Fork Road, the State of Idaho Transportation Department reported that 386 vehicles used the road in one day in August 2010 (Viste pers. comm.). This is consistent with the estimates from Custer County of 400 cars per day during the peak season, which lasts from July to September (Lanier pers. comm.). However, usage drops off significantly in the off-season. Off-season traffic may amount to fewer than 10 vehicles per day (Lanier pers. comm.).

Custer County holds a Forest Road and Trail Act (FRTA) easement for the paved portion of Yankee Fork Road that extends 3.06 miles along the road north of Highway 75. This FRTA easement grants Custer County jurisdiction over the section of the road within the site. The realignment of Yankee Fork Road as well as the road usage by the construction crews would not require permits from Custer County (Lanier pers. comm.). However, the U.S. Forest Service (USFS) likely would require a modification of Custer County's current FRTA easement to reflect the new path of the road, which may come with additional stipulations, as yet to be determined, under USFS FRTA regulation (Schuldt pers. comm.).

**Figure 3.2-2. Proposed Site for the Yankee Fork Weir Facility**

### 3.2.1.3 Panther Creek Weir Facility

The Panther Creek weir facility is in a remote location in the mountains of the Salmon-Challis National Forest. It sits about a 10-minute drive south of the unincorporated community of Cobalt, about 36 miles or a 90-minute drive from the town of Salmon (population: about 3,100), and about 47 miles or two hours from the town of Challis (population: about 1,000) (U.S. Census Bureau 2010). The site is located at a Forest Service field station, which is actively used by USFS staff during the summer season (Callaghan pers. comm.). The McDonald Flat campground is about 3 miles southwest of the site. The Blackbird Mine is about 6.7 miles from the site.

Recreation and mining serve as the primary draws for vehicle traffic in the area. The remote location is attractive to people seeking outdoor recreation, especially hunters. Due to hunting, October is the month of highest usage for recreational vehicle traffic (Schuldt pers. comm.). Hunting groups often camp in one section of the forest and drive to other locations within the forest to access points from which to launch their trip (Schuldt, pers. comm.).

A 2003 traffic count from USFS recorded an average of 36 vehicles daily along Panther Creek Road near the site from September 22 to October 2. More recent traffic counts for this area are not available, but USFS reported that they expect current traffic volumes to be equal to or below the counts recorded in 2003.

Sites along Panther Creek Road are accessible without passing through the site and, as shown in Figure 3.2-3, there are alternative routes to Panther Creek-area destinations. For drivers already starting near Highway 93, there are multiple routes to reach sites along Panther Creek Road, either north or south of the site.

Lemhi County and USFS both help to maintain Panther Creek Road, but USFS has jurisdiction over the road between the intersections with Blackbird Creek and Morgan Creek (Schuldt pers. comm.). Construction crews would not require Lemhi County permitting to use the roads (J. Davis pers. comm.). USFS would require permitting for commercial use of a Forest System road. The permit would be included as an addendum to the special use permit for the construction and operation of the weir facilities.

**Figure 3.2-3. Proposed Site for the Panther Creek Weir Facility**

#### 3.2.1.4 Weir-to-Hatchery Route

During the operation of the new facilities, hatchery trucks would need to make trips from Yankee Fork or Panther Creek to the Crystal Springs hatchery facility (Stone pers. comm. 2015b). The primary route to and from the Panther Creek weir facility would be to travel south on Panther Creek Road to Williams Creek/Deep Creek Road until they reach Highway 93, on which they would continue south to Highway 26 and Highway 39, ultimately exiting Highway 39 onto Steclein Road and turning onto River Road to reach the Crystal Springs hatchery site. From the Yankee Fork weir facility, trucks would travel south on Yankee Fork Road, turn east on Highway 75 and continue until reaching Highway 93, at which point they would follow the same route southward as if from Panther Creek to the Crystal Springs hatchery site.

## 3.2.2 Environmental Consequences

The main types of impact on transportation uses from the Hatchery Program fall into the following categories:

1. *Driving Delay.* If construction or operations cause drivers who intend to use the roads along the site to halt to allow construction trucks to pass or enter the road, the Hatchery Program may impose delays on road users.
2. *Road Closure.* If roadwork at the sites is completely impassable and the road becomes closed, construction may deprive drivers of access to points on opposite sides of the road or impose time delays by forcing drivers to use alternate routes along slower paths to their destination.
3. *Road-User Safety.* If construction occurs without good visibility, it may endanger road crews and drivers who are moving too fast to stop for construction. Alternatively, if the Hatchery Program construction physically alters the road by increasing the degree of curve or affecting sightlines it may affect road safety.

#### 3.2.2.1 Alternative 1: Hatchery Program with Permanent Weirs

##### Crystal Springs Hatchery Site

**Construction**

Construction of the Crystal Springs hatchery would occur entirely off of River Road and on the 10.7-acre hatchery site. The Hatchery Program would develop administrative offices, a hatchery building, outdoor rearing ponds, a workshop, detached residences, and parking spaces. The three residences would take up about one-third of the site, including garages, septic fields, and driveways. All construction is anticipated to be completed within a period of 14–18 months.

Engineers who have reviewed the proposed Crystal Springs hatchery expect construction to require minimal interference with the road. No construction would take place in the road, and the only potential for traffic impacts would come from construction trucks that make slow entrances and departures from the site. Impact on transportation during construction is considered **low**. Figure 3.2-4 shows the site and nearby roads.

**Figure 3.2-4. Crystal Springs Hatchery Site and Nearby Roads**


Source: McMillen, LLC 2013a.

### *Traffic Safety*

The speed limit on River Road is posted at 50 miles per hour. However, due to the nature of the road, most drivers travel within the range of 30 to 40 miles per hour (Monson pers. comm.).

The proposed Crystal Springs hatchery poses minimal safety risk to drivers in the area, primarily because construction would take place off of River Road and the only anticipated impact on road use would result from the coming and going of heavy trucks. However, the construction may pose a limited safety risk by requiring cars to slow or stop, which is not typically required on this stretch of road. Regardless, this impact on traffic safety is considered **low**.

#### *Road Capacity*

Above-average impacts on the road from construction trucks would not be expected (Monson pers. comm.; Reiser pers. comm. 2015a), resulting in **no** impact on road capacity during construction.

#### *Accessibility*

As mentioned in Section 3.2.1, *Affected Environment*, for the Crystal Springs hatchery, traffic counts south of Highway 39 in the vicinity of the hatchery site recorded average daily vehicles in the range of 26 to 81 between 2009 and 2011 (Jensen pers. com.). Only about 10 to 20 vehicles pass the Crystal Springs hatchery site on a typical summer day (Monson pers. comm.), and fewer in the fall through spring.

Drivers may use these roads to access nearby agricultural property or the recreation opportunities at McTucker Ponds or American Falls Reservoir. All of these sites are accessible without passing by the hatchery site. While it is not expected that vehicles would need to take alternative routes to these sites, rerouting around the hatchery site would cause an increased travel time of approximately five minutes.

Drivers may face brief delays if they must slow down to accommodate trucks entering and leaving the construction site. Delays for this type of event would not likely exceed five minutes. Overall, impacts on accessibility would be short-term and **low.**

### Operation

During the hatchery's normal operations, four off-site employees would drive to and from the site daily, seven days each week, all year long. Additionally there would be three employee residents. Because the employee residents live on site, they would not need to drive to and from the hatchery daily for work, but may need to make occasional trips off site to get supplies, or for non-work related trips.

In addition to trips related to employee access, the hatchery facility would occasionally receive deliveries related to hatchery operations. These include the following:

1. Under Alternative 1, four deliveries each would arrive from the Yankee Fork and Panther Creek sites (eight trips total) that would involve regular pick-up trucks delivering eggs to the hatchery. Under Alternative 2, only four of these trips would occur, coming from the East Fork Salmon River facility. These trips, under either alternative, would occur once a week during a four-week period from the last week of August to the third week of September.
2. Under Alternative 1, the hatchery would receive deliveries of food for fish in the hatchery from small pickup trucks. This would occur every two weeks for the entire year.
3. Under Alternative 1, large trucks carrying 5,000-gallon water tanks would transport smolt from the hatchery to the Yankee Fork and Panther Creek sites. This would occur twice each week (one each to Yankee Fork and Panther Creek) over a four-week period from the last week of March through the first week of May.
4. School buses may visit the hatchery site for school tours. These visits are not expected to exceed one per year (Stone pers. comm. 2015b).

These vehicle arrivals and departures are expected to be infrequent and would not create traffic delays, require road closures, or result in safety concerns. Therefore the impacts during operations are expected to be extremely **low**.

## Yankee Fork Weir Facility

### Construction

Construction would take place during the summer, starting as early as April and lasting for four to five months (Lanier pers. comm.; Reiser pers. comm. 2015a). The road realignment would progress by first constructing the realigned road while keeping the current road open. After construction of the realigned road finished, crews would open that road to traffic and begin to deconstruct the current road and build Hatchery Program-related facilities in its place. Lane interruptions would be limited to a two-to-three-week window, when crews would reduce the road to one lane of traffic. Impacts on transportation during construction are considered **low**. Figure 3.2-5 shows the Yankee Fork site and the site of the proposed road realignment.

#### *Traffic Safety*

The realignment of the road would increase the sharpness of an existing curve in the road, which turns right around a bend for northbound traffic. The road realignment is not expected to make the road more dangerous for drivers; with proper signage, it may even make it safer by encouraging drivers to reduce their speed (Lanier pers. comm.; Reiser pers. comm. 2015a). The posted speed limit is 35 miles per hour. The increased curve may slow people to 25 miles per hour. The existing road has sharp curves, and the realignment could improve its safety (Lanier pers. comm.). In addition to the realignment, the proposed Yankee Fork weir facility may involve the construction of a crosswalk north of the site to make crossing safer for campers at Pole Flat Campground (which would remain east of the road after realignment) and for workers at the weir facility. The realignment would have a **low** beneficial impact on traffic safety, as it would constitute a moderate improvement.

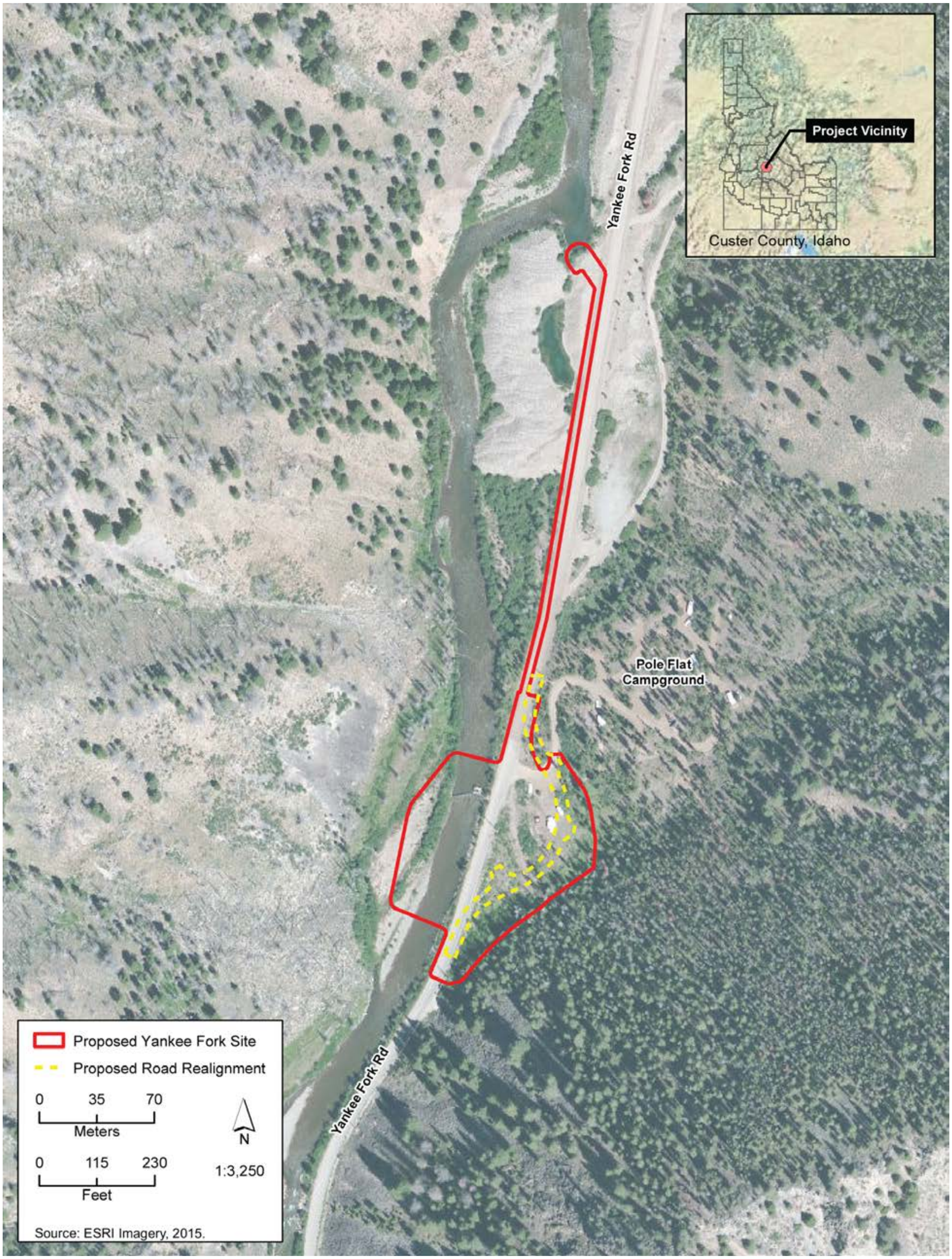
#### *Road Capacity*

Yankee Fork Road already experiences usage by heavy trucks that use the roads for work related to logging and mining. Custer County does not expect the construction trucks to have an above-average impact on the road. Furthermore, they expect Yankee Fork Road to have the physical capacity for any vehicle that may safely travel the state highways, which includes the trucks needed for the Yankee Fork weir facility's construction (Lanier pers. comm.). Construction at Yankee Fork would result in **low** impact on road capacity.

#### *Accessibility*

Drivers primarily use the road to access forest recreation; however, mine and logging crews also use the roads to access work sites. Overall, traffic tends to peak in the summer from July to September. As mentioned in Section 3.2.1, *Affected Environment*, for the Yankee Fork weir facility, summertime traffic amounts to approximately 400 vehicles per day, but drops off significantly outside of the summer months to as low as fewer than 10 vehicles per day (Lanier; pers. comm.; Viste pers. comm.).

**Figure 3.2-5. Proposed Road Realignment at the Yankee Fork Weir Facility**




Source: McMillen, LLC 2013b.

During parts of the realignment, road interruptions may have to occur that would involve the closure of no more than one lane, and would occur within a two-to-three-week window. There would be no full road closures (Reiser pers. comm. 2015a; Stone pers. comm. 2015b). In addition to the construction that may require the occasional closure of a lane, traffic may occasionally be stopped because of cumbersome trucks entering or departing the construction site. Crew members may need to slow cars or temporarily halt them to allow construction crews to enter or leave the site. Impacts on accessibility would be short-term and **low** because construction disruptions would not eliminate accessibility but could result in some traffic slow-down.

#### Operation

During the facility's normal operations, one truck would bring one or two employees to the facility where they would stay for a four-day period. Total employee trips during the summer (including late spring and early fall), when the facility is operating, would amount to once every four days.

In addition to trips related to employee access, the Yankee Fork weir facility would occasionally send deliveries. These include the following.

1. Four deliveries would depart the site from small pick-up trucks, once per week during a four-week period from the last week of August to the third week of September.
2. Large trucks carrying 5,000-gallon water tanks would arrive at the Yankee Fork site once each week over a four-week period, from the last week of March through the first week of May (Stone pers. comm. 2015b).

These vehicle arrivals and departures are expected to be infrequent and not impose substantial impacts via traffic delays, closures, or safety issues; therefore, these transportation impacts during operations would be expected to be **low**.

### Panther Creek Weir Facility

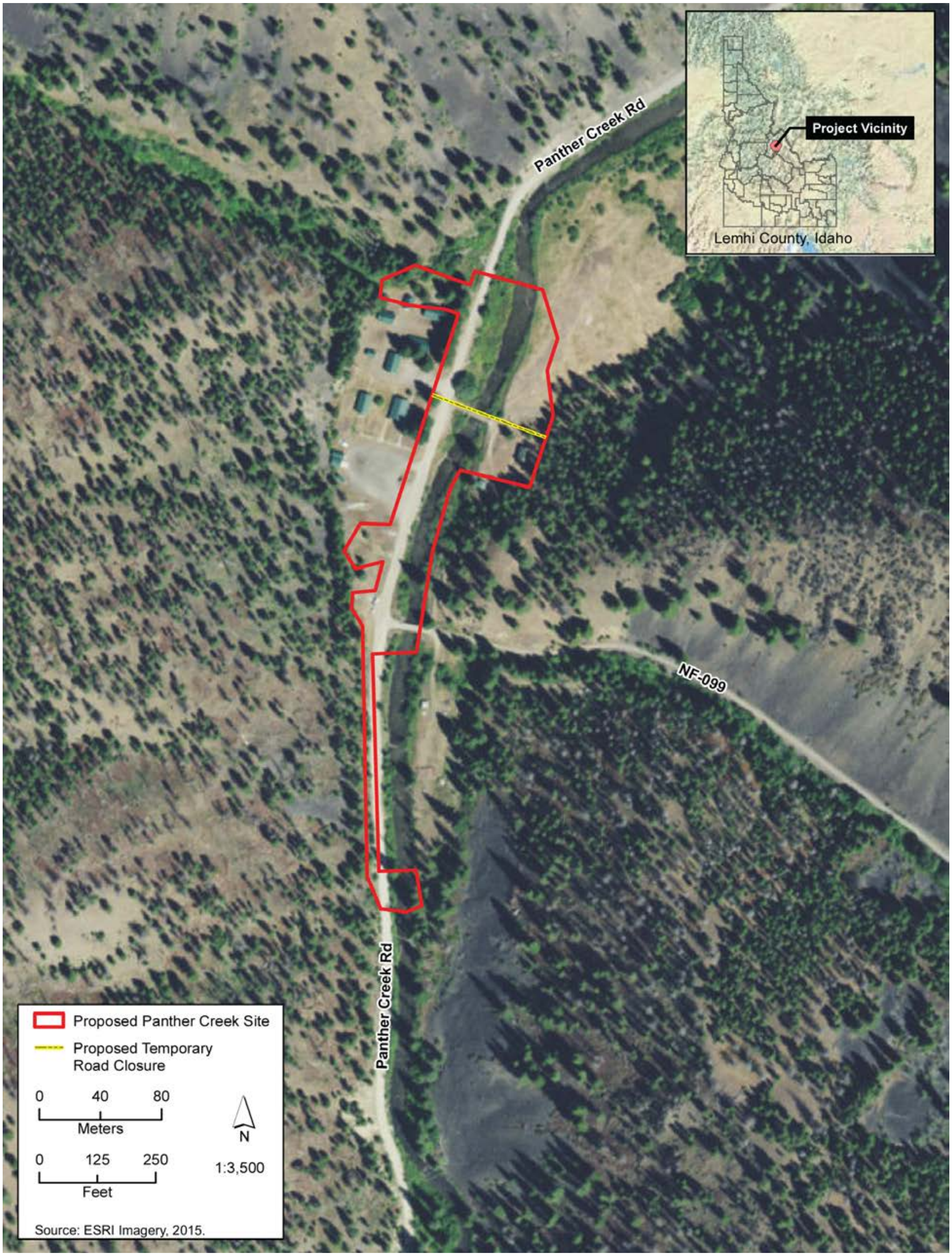
#### Construction

Construction would take place along Panther Creek Road in the summer, during weekdays. It would involve the creation of a weir on the east side of the road and improvements to the existing USFS facility on the west side. In contrast to Yankee Fork Road, Panther Creek Road has only one lane. As described in Chapter 2, *Alternatives, Including the Proposed Action*, construction is expected to last four months.

A new water intake that would travel under Panther Creek Road would require a temporary closure of the section of the road near the site, north of Copper Creek Road. The closure period would not last more than one hour during the two-week work window while the intake piping for the permanent facility would be trenched. (Reiser pers. comm. 2015a; Stone pers. comm. 2015b). Outside of the closure period, road interruptions would be limited to brief delays to accommodate crews or trucks as they enter or leave the road. Figure 3.2-6 shows the Panther Creek site and the site of the possible temporary road closure.

USFS reported that there are phone and possibly electrical lines underground near Panther Creek Road. These utility lines would need to be located before proceeding with belowground work (Schuldt pers. comm.). There would be **low** impacts due to increased traffic during Panther Creek weir facility construction.

**Figure 3.2-6. Proposed Temporary Road Closure at the Panther Creek Weir Facility**




Source: McMillen, LLC 2013c.

***Traffic Safety***

During the period of closure, non-construction vehicles would not be near the construction site. Outside of the closure period, construction safety issues may arise from drivers not expecting to slow for the construction. Vehicles traveling the road include horse trailers and vehicles towing ATVs or other motorized vehicles; they are often traveling at unsafe speeds. Additional construction or other activity could affect the level of safety in the area (Callaghan pers. comm.). The physical quality of the road prevents drivers from going faster than between 30 to 35 miles per hour (J. Davis pers. comm.). Vehicles may need to slow or halt to accommodate trucks entering or leaving the construction site.

The proposed Panther Creek weir facility would not make significant alterations to the course of the road. During traffic closures, there would be no traffic on the road, resulting in a **low** impact on traffic safety.

***Road Capacity***

Lemhi County helps to maintain Panther Creek Road, but USFS owns and has jurisdiction over it. The road has the capacity to handle the types of heavy trucks expected for construction (J. Davis pers. comm.; Schuldt pers. comm.), so there would be a **low** impact on the capacity of Panther Creek Road.

***Accessibility***

Closure of Panther Creek Road would impact accessibility primarily for drivers who are trying to access points along Panther Creek Road to the north or south of the site and for whom the quickest route does not include Highway 93 (i.e., predominately drivers who are already in the National Forest). For vehicles that intend to access sites in Panther Creek generally, or the Blackbird Mine (from Salmon, for example), or points as far southeast as Ellis, the fastest route does not pass the Panther Creek site.

Sites on both sides of the Panther Creek site remain accessible through alternative routes; no location would be made inaccessible by a road closure. Therefore, the accessibility impact would be a matter of delays due to waiting for passage to reopen (not more than an hour delay) or by rerouting.

Trips that have an origin or destination south of the Panther Creek construction site and an origin or destination at points north of Salmon would need to either wait for passage to reopen (not more than an hour delay) or reroute during the closure south onto Iron Creek Road to the junction of Highway 93. Without a closure on Panther Creek Road, these trips would take about an hour and 45 minutes (38 miles), but during the closure, the rerouting could add up to 45 minutes (an additional 16 miles) of drive time for a total of 2.5 hours. The reroute would result in a 30% increase in drive time, a short-term, **high** impact. For trips with an origin or destination north of the Panther Creek construction site and an origin or destination point south on Highway 93 or on Highway 75, there is essentially no drive time difference between a north route that uses Moccasin Creek Road and a south route that uses Panther Creek Road, a **low** impact. Accordingly, the overall impact on accessibility could be considered **high**.

#### Operation

During the facility's normal operations, one truck would bring one or two employees to the facility where they would stay for a four-day period. Total employee trips during the summer (including late spring and early fall), when the facility is operating, would amount to once every four days.

In addition to trips related to employee access, the Panther Creek weir facility, like Yankee Fork weir facility, would occasionally send deliveries. These include the following:

1. Four deliveries would depart the site from small pick-up trucks, once per week during a four-week period from the last week of August to the third week of September.
2. Large trucks carrying 5,000-gallon water tanks would depart the Panther Creek weir facility once each week over a four-week period, from the last week of March through the first week of May (Stone pers. comm. 2015b).

These vehicle arrivals and departures are expected to be infrequent and would not create traffic delays, require road closures, or result in safety concerns; therefore, these transportation impacts during operations would be **low**.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Similar to full production, construction could cause delays when trucks enter and leave the site; however, posting flaggers would help to minimize this impact, which is considered **low**.

Because production of Chinook salmon would be reduced by 50%, operational impacts related to transportation would slightly less than that described for full production under Alternative 1. The number of truck trips between sites during hatchery operation would be reduced at the Crystal Springs hatchery because there would be a reduction in stock deliveries, resulting in an overall decrease in traffic-related impacts. The impact created by increased truck traffic during operations under the reduced production option would be **low.**

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 1. Similar to full production, construction at the Yankee Fork site would entail short traffic delays, which is considered a **low** impact. Construction at Panther Creek, however, would require limited closure of Panther Creek road (not to exceed one hour) for two weeks with no reasonable detour available. Although mitigation (i.e., appropriate signage), would be implemented, this is considered a **high** impact.

Because approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be slightly less under the reduced production option as with full production under Alternative 1. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operate for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock are representative of the genetic makeup of the natural-production fish population.) However, the number of trips needed for outplanting would be reduced, resulting in a **low** impact on transportation.

### 3.2.2.2 Alternative 2: Hatchery Program with Temporary Weirs

#### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with transportation at the Crystal Springs hatchery would be the same as described under Alternative 1.

#### Yankee Fork Weir Facility

##### Construction

No construction is proposed as the temporary weir facility at Yankee Fork would be installed by hand.

##### Operation

Under Alternative 2, no permanent facilities would be constructed and Yankee Fork Road would not be realigned. Set-up of the temporary weir would not be expected to exceed one week (Stone pers. comm. 2015b). There is sufficient capacity to handle the proposed vehicular traffic on Yankee Fork Road. Alternative 2 would not require lane closures or temporary road closures, so no impact on accessibility for other drivers on Yankee Fork Road would occur. If the road realignment would in fact make Yankee Fork Road safer, then Alternative 2 would preserve the dangerous conditions in which workers frequently need to cross the road with no marked crosswalk amidst fast-moving vehicles. During weir facility operations, Alternative 2 would require employees to travel to and from the site daily. This would constitute an increase from the number of employee trips under Alternative 1 (once every four days), but would still amount to a small share of overall traffic on the road. Additionally, once every other day, small pickup trucks would need to travel between Yankee Fork and the East Fork Salmon River facility to deliver materials (Stone pers. comm. 2015b). These vehicle arrivals and departures are expected to be infrequent and would not create traffic delays, require road closures, or result in safety concerns, resulting in **low** impacts on transportation.

#### Panther Creek Weir Facility

##### Construction

No construction is proposed as the temporary weir facility at Panther Creek would be installed by hand.

##### Operation

During weir facility operations, Alternative 2 would require hatchery employees to travel to and from the site daily. This would constitute an increase from the number of employee trips under Alternative 1 (once every four days), but would still amount to a small impact on the road's traffic. Additionally, small pickup trucks would need to travel once every other day between Panther Creek and the East Fork Salmon River facility to deliver materials (Stone pers. comm. 2015b). These vehicle arrivals and departures are expected to be infrequent and not impose substantial impacts via traffic delays, closures, or safety issues. Transportation impacts related to Panther Creek operations under Alternative 2 would be **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weirs at the Yankee Fork and Panther Creek sites. As a result, there would be **no** construction-related impacts on transportation.

Because approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be slightly less under the reduced production option as with full production under Alternative 1. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operate for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock are representative of the genetic makeup of the natural-production fish population.) However, the number of trips needed for outplanting would be reduced, resulting in a **low** impact on transportation.

# 3.2.3 Mitigation

The Shoshone-Bannock Tribes would implement the following mitigation measures to avoid or minimize impacts on transportation during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.2.3.1 Alternative 1: Hatchery Program with Permanent Weirs

### Construction

#### Crystal Springs Hatchery Site

Northbound traffic that approaches the Crystal Springs hatchery site from the south would need signage because of limited visibility while approaching the site. Signs would be placed well in advance of the site to make oncoming traffic slow down. Additional signage and flaggers would be used when oncoming traffic needs to come to a complete stop to accommodate construction trucks entering or leaving the facility.

#### Yankee Fork Weir Facility

Flaggers in the road during construction would help halt traffic while trucks pull into or out of the worksite to help slow traffic and limit risk of collisions. Traffic safety impacts from the interaction of fast-moving vehicles and construction crews would be mitigated by providing adequate signage and warning of the need for cars to slow or stop in advance of the site in order to allow construction trucks to enter or leave the site.

#### Panther Creek Weir Facility

Flaggers in the road during construction would help halt traffic while trucks pull into or out of the worksite to help slow traffic and limit risk of collisions. Traffic safety impacts from the interaction of fast-moving vehicles and construction crews can be mitigated by providing adequate signage and warning of the need for cars to slow or stop in advance of the site in order to allow construction trucks to enter or leave the site.

To mitigate the impacts of temporary short-term road closures, signage would be posted at the entrance to Morgan Creek Road (near Challis, Idaho) and Williams Creek/Deep Creek Road (near Salmon, Idaho) and at the entrance to Panther Creek Road advising drivers of the potential delay. Flaggers and pilot cars would help drivers navigate through the construction area during staggered open times to facilitate the movement of traffic throughout the construction period both upstream and downstream of the proposed weir facility on Panther Creek Road.

Additionally, the impact would be mitigated by providing advance notification to affected parties (primarily people pursuing outdoor recreation) and by scheduling the temporary closures in the lowest-use time of the season. Scheduling construction before October would avoid interrupting the usage of the road by hunters (Schuldt pers. comm.). While precise traffic volume estimates are not available to determine the time of year with the lowest volume, interviews with members of the outdoor recreation community in the region may demonstrate when access to those sections of the forest are the most important.

### Operations

Impacts during operation at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites are considered low; no mitigation is required.

## 3.2.3.2 Alternative 2: Hatchery Program with Temporary Weirs

### Construction

#### Crystal Springs Hatchery Site

Implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation is proposed.

### Operations

Impacts during operation at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites are considered low; no mitigation is required.

## 3.2.4 No Action Alternative

Under the No Action Alternative, construction of the hatchery facilities would not take place and associated traffic would not access the site. There would be no impacts associated with transportation at the Crystal Springs hatchery and Panther Creek weir facility under the No Action Alternative.

The No Action Alternative would not introduce any construction-related traffic interruptions. If a special-use permit is not granted to continue operations at the Yankee Fork weir facility, pedestrian and vehicle traffic at the site related to weir operation activities would cease, eliminating traffic safety issues present under current conditions. As the road realignment under Alternative 1 would improve general traffic safety through proper signage and slowing traffic, the No Action Alternative would retain potentially dangerous road conditions, resulting in a **moderate** impact.

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# 3.3 Geology and Soils

This section describes the affected environment and environmental consequences, including mitigation measures, associated with geology and soils from implementation of Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operations of the Hatchery Program under two Chinook salmon production level options: the proposed production level (production of up to 1 million Chinook smolts) and a 50% production level. This section also summarizes the federal Wild and Scenic Rivers Analysis presented in Appendix D for the geology outstandingly remarkable value (ORV), which is considered in the geology and soils affected environment and the environmental consequences analysis for both Yankee Fork and Panther Creek.

## 3.3.1 Affected Environment

The analysis area for direct impacts is limited to the individual sites proposed for the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility. For indirect and cumulative impacts, the analysis area includes these sites and adjacent areas that could potentially be affected by construction or operations, such as erosion or sedimentation in downstream receiving waterbodies.

The best available science was used for the analysis of geology and soils, including: analysis of published geologic and seismic risk mapping; Natural Resources Conservation Service soils mapping; wetland delineation reports; review of historic aerial imagery to assess channel migration; and geotechnical engineering studies and engineering design drawings of the sites.

The following documents are relevant to geological resources and were used as reference materials for this analysis:

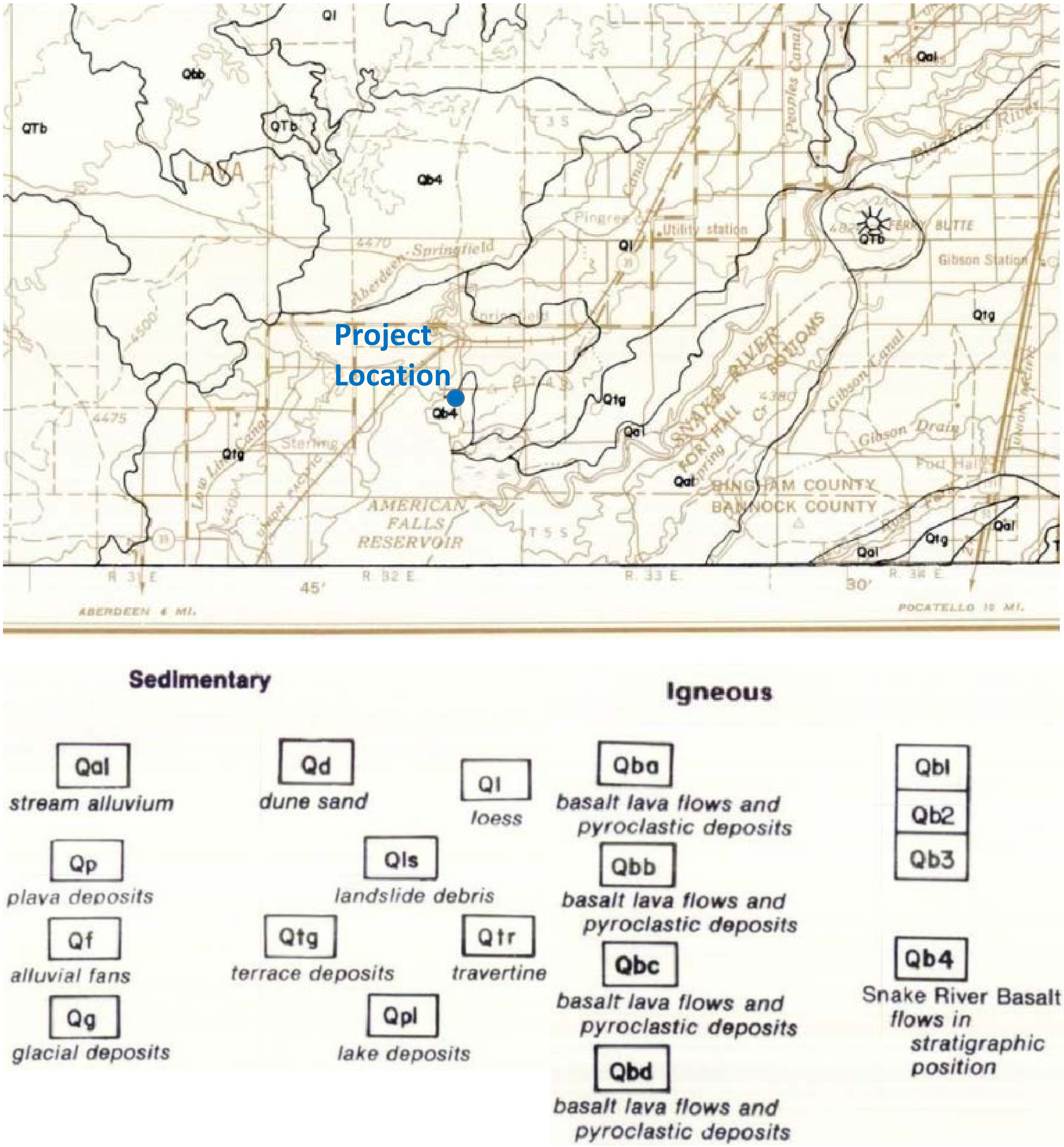
- Idaho Transportation Department (ITD) Materials Manual
- ITD Standard Specifications for Construction
- ITD Design Manual
- ITD Erosion and Sediment Control Best Management Practices Manual
- American Association of State Highways and Transportation Officials Load and Resistance Factor Design Bridge Design Specifications
- International Building Code standards for seismic risk

### 3.3.1.1 Regional Geology

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery would be located on the alluvial plain of the Snake River in sedimentary loess (Ql) and terrace (Qtg) deposits (Figure 3.3-1) (Rember and Bennett 1979).

**Figure 3.3-1. Geologic Map of the Idaho Falls Quadrangle**




Source: Rember and Bennett 1979

### Yankee Fork Weir Facility

Most of the Yankee Fork watershed is within the Challis Volcanics, which is made up largely of extrusive lava flows, welded tuffs, and volcaniclastic deposits (Figure 3.3-2) (Reclamation 2012a). Plutonic rocks of the Idaho batholith, and sedimentary and metasedimentary rocks of Paleozoic and Precambrian formations are located within the lower Yankee Fork watershed (Reclamation 2012a).

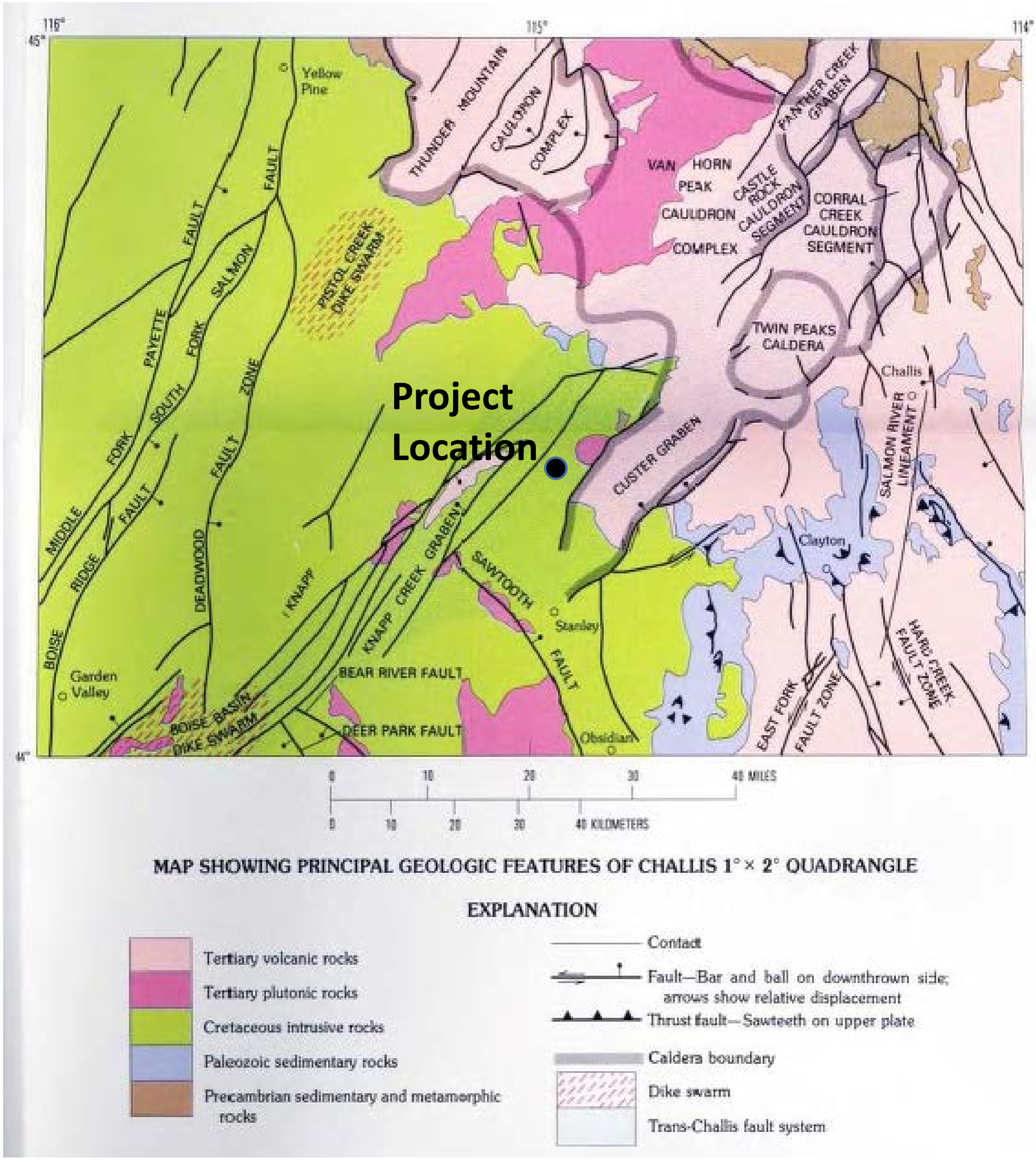
The Trans-Challis fault zone, which bisects the watershed in a northeast alignment, has displaced many of the bedrock geologic units. The Yankee Fork's headwaters are in the Twin Peaks caldera; the stream then flows southeast for most of its length along the bounding fault of the Custer graben. Terraces, U-shaped valleys, and broad outwash plains were formed by two episodes of Pleistocene glaciation. The slope of the Yankee Fork steepens in its lowermost 3-mile reach upstream of the confluence with the Salmon River due to river incision that created a V-shaped canyon (Reclamation 2012a). This is the area that includes the Yankee Fork site.

Under the National Wild and Scenic Rivers System, Yankee Fork is considered eligible under the "Recreation" classification for Wild and Scenic Rivers (USFWS 1989). Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad, and that may have some development along their shorelines or may have undergone some impoundment or diversions in the past. There are two eligible segments of the Yankee Fork relevant to this analysis. Segment A is the lower reach heading upstream from the mouth for 2 miles; Segment B is immediately upstream of Segment A, from the private land boundary upstream from the Pole Flat campground to Jordan Creek, approximately 6 miles in length. The Yankee Fork site is located within Segment A, very near its boundary with Segment B.

While these segments have been determined to be "eligible" (a determination made by a river-managing federal agency), they have not been "designated" (a determination made only by an act of Congress or the Secretary of the Interior). Eligible rivers are not protected by the Wild and Scenic Rivers Act, but U.S. Forest Service (USFS) policy is that an eligible river must be protected as far as possible to the same extent as designated rivers. This includes protecting the river's free-flowing characteristics (described in Section 3.3.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*) as well as its ORV for which the Yankee Fork was found eligible, and what it is about these values that make them outstandingly remarkable and fitting for this river's consideration for Wild and Scenic River status.

Geology is an ORV for both Segments A and B of Yankee Fork. Impacts on the geology ORV are discussed below, and the results of the Section 7 Wild and Scenic Rivers Analysis are described in Appendix D.

**Figure 3.3-2. Geologic Map of the Challis 1° by 2° Quadrangle**




Note: The Yankee Fork watershed is located along the southeast bounding fault of the Custer Graben (Reclamation 2012a).

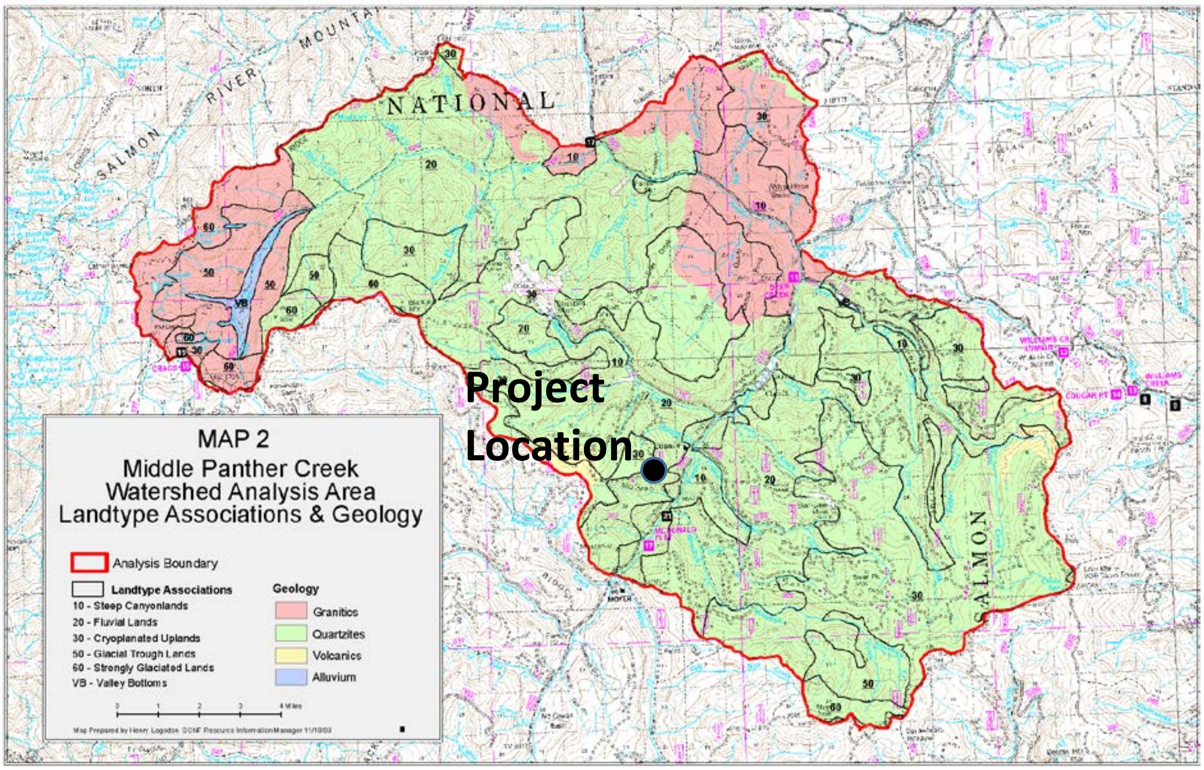
Source: U.S. Geological Survey (1995), as cited in U.S. Bureau of Reclamation (2012a).

### Panther Creek Weir Facility

Bedrock in the Panther Creek watershed is predominantly quartzite with a small percentage of granite (Figure 3.3-3). The Panther Creek weir site is on quartzite bedrock in steep canyonland terrain with V-shaped valleys formed by fluvial incision. Rock outcrops and talus slopes are common in canyons near the weir site (USFS 2008).

Panther Creek was also determined to be eligible under the "Recreation" classification for Wild and Scenic River status in 1993 (Appendix D). Geology is an ORV for Panther Creek. Impacts on the geology ORV are discussed below, and the results of the Section 7 Wild and Scenic Rivers Analysis are described in Appendix D.

**Figure 3.3-3. Middle Panther Creek watershed Geology and Land Type Associations**




Source: USFS 2008

## 3.3.1.2 Seismic Activity

Seismic activity at the three sites is discussed in terms of the U.S. Geological Survey's National Seismic Hazard Maps (USGS 2015a). The U.S. Geological Survey hazard maps are based on current information on the rate at which earthquakes occur in different areas and on how far strong shaking extends from earthquake sources. Levels of horizontal shaking are expressed as a percentage of the acceleration (PGA) of a falling object due to gravity that has a 2-in-100 chance of being exceeded in a 50-year period.

## Crystal Springs Hatchery Site

The seismic hazard for the Crystal Springs hatchery site is mapped by the U.S. Geological Survey as low, with a value of 10–14 PGA (Figure 3.3-4). The nearest fault mapped by the Idaho Geological Survey is Fault 1386 located 20 miles to the east, which is a north-northwest trending, high-angle, down-to-the-southwest, normal fault (Idaho Geological Survey 2015).

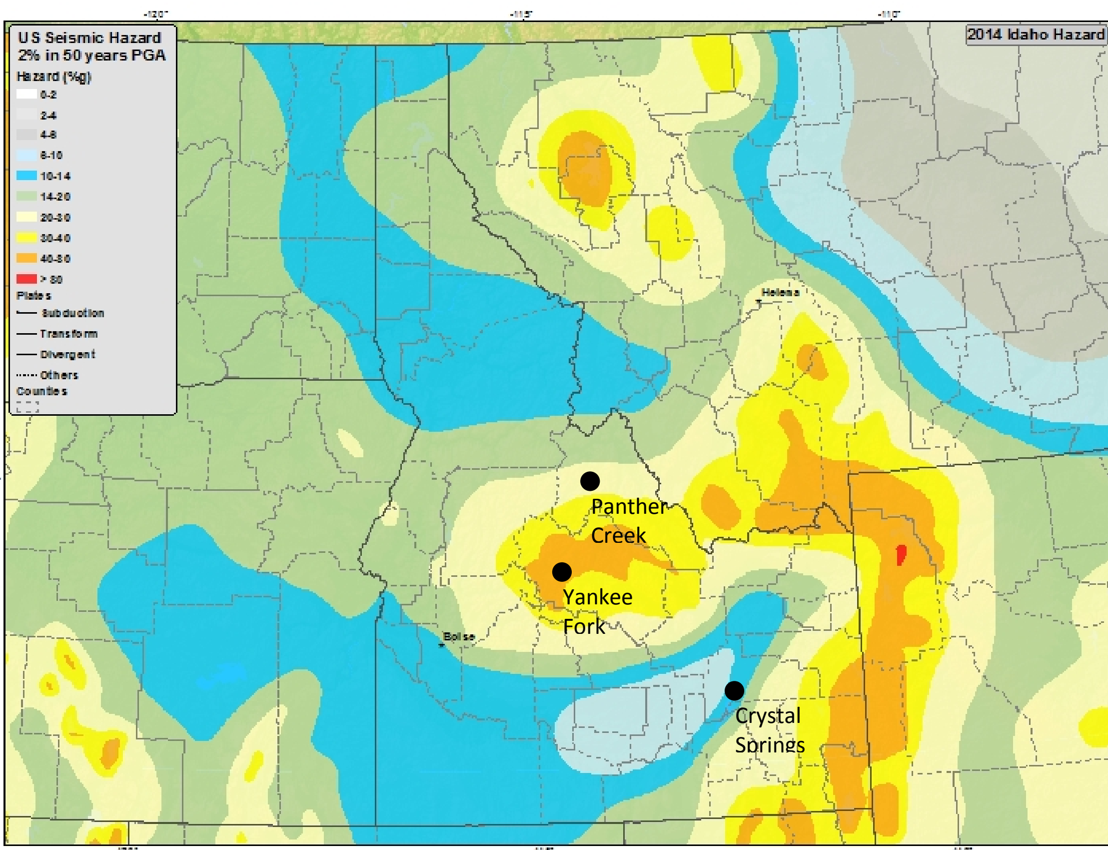
## Yankee Fork Weir Facility

The seismic hazard for the Yankee Fork site is mapped by the U.S. Geological Survey as moderately high with a value of 40–80 PGA (Figure 3.3-4). The nearest fault mapped by the Idaho Geological Survey is Fault 1294 located 12 miles to the southwest, which is a down-to-the-west normal fault along the east side of the Sawtooth Valley (Idaho Geological Survey 2015).

## Panther Creek Weir Facility

The seismic hazard for the Panther Creek site is mapped by the U.S. Geological Survey as moderate with a value of 14–20 PGA (Figure 3.3-4). The nearest fault mapped by the Idaho Geological Survey is Fault 1512 located 29 miles to the southeast (Idaho Geological Survey 2015).

**Figure 3.3-4. U.S. Geological Survey's 2014 Seismic Hazard Map of Idaho**




Source: U.S. Geological Survey (2015a)

### 3.3.1.3 Site Topography

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery site slopes to the south and east from the higher ground at the north and west portions of the site (Figure 2-2). The ground slope increases on the eastern and southern boundaries as elevations drop down to McTucker Creek and the series of wetland ponds. The ponds, which collect flow from artesian wells and potentially from subsurface flow, are connected by short channels extending from north to south. Water ultimately drains southwest toward the delta of American Falls Reservoir on the Snake River.

#### Yankee Fork Weir Facility

The Yankee Fork valley is about 300 feet wide where the proposed facilities would be constructed. The land east of Yankee Fork Road and south of Pole Flat Campground is a generally flat terrace feature that slopes gently to the south (Figure 2-5). The land on the river's west bank rises abruptly to a terrace feature higher than the eastern terrace, which is isolated from the adjacent hillslope by what appears to be a former high flow channel of the Yankee Fork. The channel banks are approximately 7 feet tall and elevations rise quickly just east and west of the proposed work area beyond the toes of the hillslopes.

#### Panther Creek Weir Facility

The Panther Creek valley contains a generally flat terrace feature about 500 feet wide where the proposed facilities would be constructed (Figure 2-9). The channel banks are approximately 5 to 7 feet tall and elevations rise quickly on hillslopes that adjoin both margins of valley floor.

### 3.3.1.4 Soils

#### Crystal Springs Hatchery Site

Soil mapping performed by soil survey staff with the Natural Resources Conservation Service (Figure 3.3-5) shows two different soil units at the Crystal Springs hatchery site (Natural Resources Conservation Service 2015a). Nearly 73% of the area is Bannock loam, a well-drained soil formed on stream terraces (Table 3.3-1). Note that the eastern boundary of the site's footprint is mapped as water by the Natural Resources Conservation Service. Inspection of aerial photography shows that this area is not inundated with water, and may be Bannock loam as well. The Bannock loam hydrologic soil group is B, which is characterized as having moderately low runoff potential when the soil is thoroughly wet and water transmission through it is unimpeded. Nearly all of the Bannock loam is in the 0–2% slope variant with a small portion in the steeper 2–4% slope variant. The Bannock loam soils have an erosion factor (K) of 0.28, which indicates the soil is moderately susceptible to sheet and rill erosion (the removal of layers of soil from the land surface by the action of rainfall or runoff) by water. Soil K values typically range from 0.02 to 0.69 and, all other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

**Table 3.3-1. Soil Types in the Crystal Springs Hatchery Footprint**

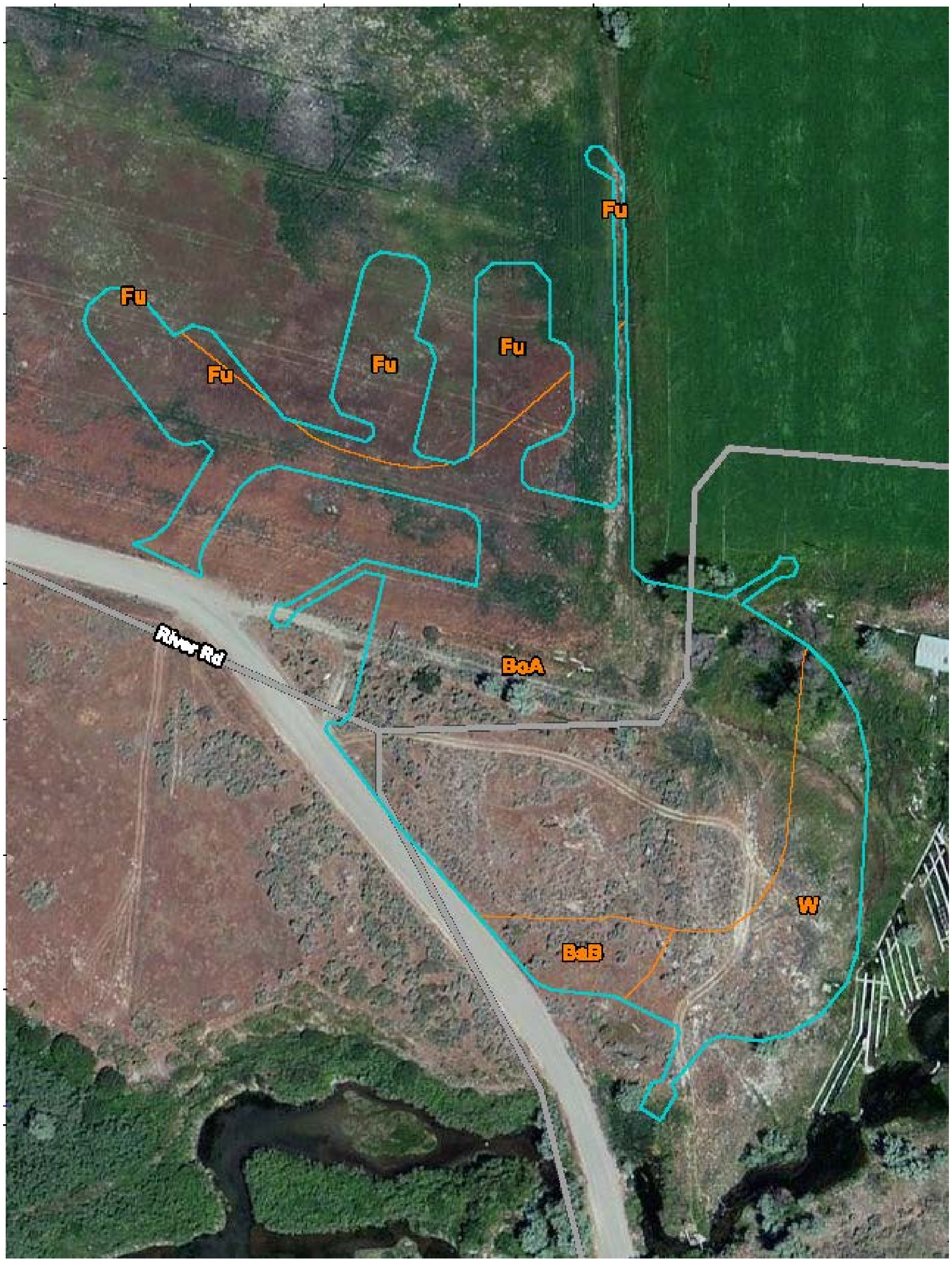
| Map Unit Symbol | Map Unit Name | Acres | Percent of Total Acreage | Landform | Natural Drainage Class | Hydrologic Soil Group | K Factor |
|---|---|---|---|---|---|---|---|
| BaB | Bannock loam, 2–4% slopes | 0.2 | 3.9% | Stream terraces | Well drained | B | 0.28 |
| BoA | Bannock loam, 0–2% slopes | 4.1 | 68.9% | Stream terraces | Well drained | B | 0.28 |
| Fu | Fulmer loam | 0.7 | 11.8% | Terraces | Poorly drained | B/D | 0.20 |
| W | Water | 0.9 | 15.3% | | | | |

Source: Natural Resources Conservation Service 2015a

The other soil type, which makes up about 11.8% of the total and occurs at the northern boundary of the site's footprint, is Fulmer loam. Fulmer loam is associated with terrace landforms and is poorly drained; it is in hydrologic soil group B/D. The Fulmer loam's K factor of 0.20 is slightly less than the Bannock loam's value of 0.28, meaning it is slightly less susceptible to erosion due to sheet and rill erosion by water.

Soil substrate conditions are also described in the geotechnical engineering report prepared for the site. The upslope area is generally composed of surficial loose silty sand and medium-dense sand with gravel and basalt bedrock, while the downslope area contains compressible lean clay with volcanic ash seams (STRATA 2012a).

**Figure 3.3-5. Soil Units at the Proposed Crystal Springs Hatchery Site. Site Footprint Drawn as Light Blue Polygon.**



### Yankee Fork Weir Facility

The Yankee Fork site is located in the Lost River Valleys and Mountains Common Resource Area, where highly erosive sand and clay-loam soils are typical (Natural Resources Conservation Service 2008 as cited in Shoshone-Bannock Tribes 2011). Gold dredges, which operated from 1939 through 1942 and again from 1945 to 1954, completely re-channeled about 6 miles of the Yankee Fork from Jordan Creek to Pole Flat Campground (Shoshone-Bannock Tribes 2011). The dredge spoils from this work are still visible on the landscape today. Beginning about 0.15 miles upstream of the proposed weir, the Yankee Fork flows between unvegetated, hummocky deposits of unconsolidated gravel and cobble with poor soil structure. The dredge spoils do not extend down to the location of the proposed weir. The soil at the Yankee Fork site is composed of alluvial deposits forming a terrace landform that contains a diverse mixture of cobble, gravel, and sand-size material. The proposed development area is generally underlain by surficial loose gravel fill overlying poorly graded, medium-dense to very dense native gravel with cobbles and boulders. The presence of boulders increases with depth and proximity to the Yankee Fork channel (STRATA 2012b). The erosion potential of the soil is considered low due to its overall coarse texture.

### Panther Creek Weir Facility

The Panther Creek site is located in the Southern Forested Mountain ecoregion of the Central Rocky Mountain Common Resource Area in the Idaho Batholith. The area contains sandy, gravelly, droughty soils (Natural Resources Conservation Service 2008 as cited in Shoshone-Bannock Tribes 2011). The soil at the Panther Creek site itself is composed of alluvial deposits forming a terrace landform that contains a diverse mixture of cobble, gravel, and sand-size material. The proposed development area is generally underlain by native alluvium consisting of dense silty gravel with sand and cobbles, with large cobbles and possibly small boulders encountered in test borings at depths of 15 to 20 feet (STRATA 2013). The erosion potential of the soil is considered low due to its overall coarse texture.

## 3.3.1.5 Fluvial Geomorphic Processes

### Crystal Springs Hatchery Site

A tributary of McTucker Creek flows to the east and south of the proposed hatchery site. It is a low-energy, low-volume, largely spring-fed channel with a silty and sandy bed that flows in a southwest direction through a series of wetland ponds. The channel also is backwatered periodically by American Falls Reservoir. The creek channel is apparently laterally stable; based on inspection of historic aerial images, it has not changed location since 1992.

### Yankee Fork Weir Facility

The Yankee Fork is a moderately steep, cobble-bed channel at the proposed weir site. The modeled water surface elevation of the 100-year flood is along the top of the Yankee Fork's east bank at the site (not extending beyond Yankee Fork Road), which indicates that the relatively flat land at the site is best characterized as a terrace landform rather than an active floodplain (Figure 2-5). Inspection of aerial photographs shows very little lateral movement of the channel between 1999 and 2004. The channel is constrained by sections of riprap along its eastern bank, which parallels Yankee Fork Road. No lateral movement and migration into the terrace feature along the channel's western bank is evident from aerial photographs. The reach is predominantly a transport reach in terms of sediment conveyance. The deposition of sediment to create transient bars is not evident in any of the aerial photos. Transport of coarse bedload in the reach primarily occurs during the peak snowmelt runoff months, which typically begin in late March or early April, peak in early June, and end in July (Reclamation 2012b). High flow levels and some sediment transport may also be associated with infrequent summer thunderstorms.

### Panther Creek Weir Facility

Panther Creek is a moderately steep, cobble-bed channel at the proposed weir site. The modeled water surface elevation of the 100-year flood is along the top of the Panther Creek's west bank at the site (not extending beyond Panther Creek Road), which indicates that the relatively flat land at the site is best characterized as a terrace landform rather than a floodplain (Figure 2-9). Aerial photographs show very little lateral movement of the channel between 1998 and 2004. The channel is constrained by sections of riprap along its western bank, which parallels Panther Creek Road. No lateral movement and migration into the terrace feature along the channel's eastern bank is evident from the aerial photographs. The reach is predominantly a transport reach in terms of sediment conveyance. The deposition of sediment to create transient bars is not evident in any of the aerial photos. Transport of coarse bedload in the reach primarily occurs during the peak snowmelt runoff months, which typically begin in April, peak in June, and end in July (USFS 2008). High flow levels and some sediment transport may also be associated with infrequent summer thunderstorms.

## 3.3.2 Environmental Consequences

Construction and operation of the proposed Hatchery Program could cause direct, indirect, and cumulative impacts on geologic and soil resources.

Potential impacts on geologic (which herein include fluvial geomorphic processes) and soil resources from the Hatchery Program were also considered in regard to their duration. Permanent impacts are those that would modify a geologic or soil resource to such a degree that the resource would not return to its preconstruction state for the life of the Hatchery Program. Temporary impacts are those that would result in the short-term disturbance of a resource but would not prevent the re-establishment of similar pre-project conditions soon after the end of construction activity in the affected environment.

Construction impacts on geologic and soil resources were determined for each of the sites by examining the proposed facility footprints and design details depicted in the engineering drawings (McMillen, LLC 2013a) and the information contained in the geotechnical engineering reports prepared for each site. Additional potential impacts were determined by considering how implementation of the Hatchery Program could be affected by natural fluvial geomorphic processes. The types of potential impacts assessed for comparison between the alternatives are as follows:

- Seismic Risk: Earthquakes in the region could damage Hatchery Program facilities.
- Oversteepening and Slope Instability: Proposed cutting of earth and fill placement construction activity could lead to slope oversteepening and instability.
- Settlement: Site facilities constructed on loose or soft soils could be subject to settlement and slope instability.
- Soil Depletion and Erosion: Materials placement required for the construction of Hatchery Program facilities could result in burial or excavation and relocation of existing soils that could

contribute to soil resource depletion. Construction of cut slopes has the potential to expose soils, and fill placement has the potential to create weak unconsolidated soils, with both scenarios increasing erosion risk that could impact water quality and air quality.

- Channel Migration: Lateral channel migration along the Yankee Fork and Panther Creek could erode the banks and damage the weirs or other facilities.
- Sedimentation: Operation of the proposed weirs may alter sediment transport in the reach during low-flow conditions due to backwatering caused by the bridge weir pickets.
- Scour: The cast-in-place concrete slab and abutments forming the proposed bridge weirs could be subject to damage from fluvial scour along the Yankee Fork and Panther Creek.
- Wild and Scenic Rivers Geology ORV: The geologic features (steep rocky and narrow canyons) present in Panther Creek and Yankee Fork are important for their scenic value. Construction and operation of the weir facilities could impact the scenic value of these canyons.

### 3.3.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

##### Construction

A geotechnical engineering evaluation was performed for the Crystal Springs hatchery site to provide specific geotechnical recommendations for preparing the site, soil improvements beneath foundation areas, earthwork activities, foundation design and construction, and to aid in identifying unsuitable soils during earthwork which could then be excavated and recompacted as structural fill below the proposed improvements (STRATA 2012a).

Procedures outlined in Section 1615.1 of the 2009 International Building Code (IBC) (International Code Council 2009) were used to evaluate site ground motions and design spectral response accelerations to determine the required seismic standards to use in the design of the facilities (STRATA 2012a). A site-specific seismic response study was not performed due to the high cost and because it is not required if the design follows the IBC design criteria for the seismic zone in which the hatchery is located (Reiser pers. comm. 2015b). Seismic spectral acceleration values used in the design for short period ($S_s$) and 1-second period ($S_1$) were 0.35 and 0.13, respectively. Site Class D properties were used as the basis for structural seismic design with short ($S_{DS}$) and 1-second period ($S_{D1}$) design spectral accelerations values of 0.36 and 0.19, respectively. This design procedure seems to indicate that there is low potential for seismic impacts on facilities at the site.

Cutting into steep slopes would increase the potential for slope oversteepening and instability; however, construction of the Crystal Springs hatchery would not require cutting into steep slopes. The buildings would be located on the mildly sloping upland areas away from the relatively steeper slopes near McTucker Creek.

***Loose Foundation Soils***

The settlement criteria for each structure were evaluated relative to the anticipated loading conditions, engineering properties of the soil, and sensitivity of the proposed structures to settlement (STRATA 2012a). As stated in STRATA's report, surficial loose silty sand and loose sand was encountered at the head box structure, and possibly at the northeast corner of the hatchery building and residences #2 and #3; this material has the potential to change volume (settle) with changes in stress (structural loading) especially when unanticipated water saturates or infiltrates the loose soil. At these locations, the loose silty sand and sand would be excavated, and replaced with granular structural fill.

#### *Rock*

Rock was encountered in borings at depths varying from 1.5 to 7 feet beneath the surface. Construction of the outdoor rearing ponds, the effluent clarifier, and the east portion of the hatchery building may encounter bedrock. Rock excavation would likely require large trackhoes with ripper teeth or pneumatic hammers to remove the rock. The bottoms of some of the structures are likely to be founded in basalt bedrock; therefore, rock anchors would be required to resist uplift loading.

#### *Undocumented Fill*

The geotechnical engineering report also concluded that any existing non-native soil at the site is considered undocumented fill that is not suitable to support future structures. Undocumented fill has the potential to settle below new foundations and slabs, and such settlement could negatively impact structures' performance. Existing undocumented fill must be completely removed and/or remediated below planned structures (STRATA 2012a).

#### *Summary*

Construction of the new hatchery facilities would result in conversion of existing soil surfaces into human-made surfaces that would result in the loss of soil resources. The proposed new hatchery infrastructure would encompass about 6.25 acres of the 9-acre eastern parcel, and hatchery staff residences would encompass 6.5 acres of the Legacy Springs parcel. Most of the conversion would be due to constructing gravel surfaces for roads, parking, and footpaths around the hatchery. Additional conversion would be due to concrete poured for the residences, shop, storage, and hatchery building foundations and the 15 outdoor rearing ponds (30-foot diameter circular tanks).

The soils at the site are moderately susceptible to sheet and rill erosion by water. Soil erosion could occur at the hatchery site on fresh cut ground or areas where hydrologic runoff patterns are altered due to grading and new site infrastructure (e.g., channelized flow, slope oversteepening) that would result in the loss of soil resources. Conversion of pervious soil into impervious surfaces, such as the outdoor rearing ponds and main hatchery building, would lead to flow concentration that could cause soil erosion. The proposed hatchery site is relatively flat, most construction would occur during the dry season, and sediment control best management practices (BMP) would be implemented to minimize the potential for soil erosion and runoff to enter surface water. A sediment and erosion control plan would be required by the Idaho Department of Environmental Quality and implemented during construction. Therefore, the impacts of construction of the Crystal Springs hatchery on geology and soils would be **low**.

### Operations

As described in the construction impacts section above, creation of new impervious surfaces at the hatchery site has the potential to increase stormwater runoff that could increase soil erosion. However, because the site is relatively flat, the potential is low. Furthermore, a Stormwater Pollution Prevention Plan that meets the Environmental Protection Agency's erosion and stormwater control BMPs would be implemented and stormwater runoff from the site would be attenuated by being channeled through a concrete dual-chambered settling pond before being combined with overflow drains that would discharge through an approximately 180-foot-long pipe into McTucker Creek.

As described in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, flows within McTucker Creek would increase seasonally during the operation of the hatchery due to discharge of hatchery source water pumped from the deeper aquifer. The increase in flow, based on seasonal hatchery operational needs, would range from a minimum of 3.1 cubic feet per second in April to a peak of 23.2 cubic feet per second in March. McTucker Creek at this location is a very low gradient floodplain backchannel of the Snake River with little potential energy for erosion. Water backs up into McTucker Creek as the American Falls Reservoir fills through the spring, and the reservoir is generally highest in late spring as snowmelt fills the reservoir. Based on this geomorphic setting, higher discharges from the hatchery in March should not result in substantial changes in flow or depth within McTucker Creek when compared to the magnitude of annual variations since increased flows should result in increased overbanking and ponding of water instead of increased channel velocities with the potential to erode the channel. Therefore, impacts of operation of the Crystal Springs hatchery on geology and soils would be **low**.

## Yankee Fork Weir Facility

### Construction

A geotechnical engineering evaluation was performed for the Yankee Fork site to explore the subsurface conditions at the proposed improvements and provide geotechnical recommendations to assist planning, design, and construction (STRATA 2012b).

Procedures outlined in Section 1615.1 of the 2009 IBC (International Code Council 2009) were used to evaluate site ground motions and design spectral response accelerations to determine the required seismic standards to use in the design of the facilities (STRATA 2012b). A site-specific seismic response study was not performed due to the high cost and because it is not required if the design follows the IBC design criteria for the seismic zone in which the proposed weir site is located (Reiser pers. comm. 2015b). Seismic spectral acceleration values used in the design for short period ($S_s$) and 1-second period ($S_1$) were 0.925 and 0.276, respectively. Site Class C properties were used as the basis for structural seismic design with short ($S_{DS}$) and 1-second period ($S_{D1}$) design spectral accelerations values of 0.635 and 0.81, respectively. This design procedure seems to indicate that there is low potential for seismic impacts on facilities at the site.

Cutting into steep slopes would increase the potential for slope oversteepening and instability; however, construction of the Yankee Fork weir facility would not require cutting into steep slopes. The buildings for Alternative 1 would be constructed on a generally flat terrace landform and away from the steep hillslope to the east.

The geotechnical engineering report states that beneath structures and pavements all undocumented fill should be removed to expose native soils (STRATA 2012b). The majority of the existing fill is anticipated to be removed with the excavations for the planned improvements. All undocumented fill would be removed below planned improvements and replaced with general structural fill. The on-site silty gravel and poorly graded gravel with sand and silt can be reused as general structural fill if it meets the requirements outlined in the geotechnical engineering report (STRATA 2012b). Loose gravel fill or dense native gravels are anticipated to be exposed in footing and slab excavations. The subgrade for all structures would extend through the existing fill. Where loose fill soil is encountered, it would be necessary to over-excavate to dense native gravel, recompact native gravel, and place granular structural fill to subgrade elevation (STRATA 2012b).

Construction of the new site facilities would result in conversion of existing soil surfaces into human-made surfaces that would result in the loss of soil resources. Most of the conversion would be due to the construction of gravel surfaces for the day-use area, RV pad, and staging area around the proposed bridge weir and adult holding and spawning facilities. Additional conversion would be due to concrete poured for a road through the site. About 425 feet of the existing Yankee Fork Road would be removed and a new 675-foot section of road would be constructed to the east and curved to circumvent the weir site. Concrete would also be used for foundations for other smaller facilities, such as the holding ponds and the weir.

Soil erosion could occur at the Yankee Fork site on fresh cut ground or areas where hydrologic runoff patterns are altered due to grading and new site infrastructure (e.g., channelized flow, slope oversteepening) that would result in the loss of soil resources. The potential for soil erosion is considered low due to the generally flat topography at the site and the coarse alluvium that makes up the terrace where construction would occur. Upon completion of construction, the primary source of stormwater runoff concentration that could cause soil erosion in the long-term would likely be created by realigning and lengthening the new concrete road proposed for the site, since this would create additional impervious area at the site. Impacts from the construction of the Yankee Fork weir facility on geology and soils would be **low**.

### Operations

Aerial photographs show very little channel migration of the Yankee Fork between 1999 and 2004. The channel is constrained by sections of riprap along its eastern bank, which parallels Yankee Fork Road. No lateral movement and migration into the terrace feature along the channel's western bank, which is a heavily vegetated area, is evident from the aerial photographs. Future channel migration would be most likely to occur on the west bank, which is not along Yankee Fork Road. Migration into the west bank could damage the bridge weir abutments and make the weir non-functional.

The proposed bridge weir would create a backwater effect while operating with the bridge and picket panels deployed in the channel by increasing depths and reducing flow velocities. The backwater effect would reduce the sediment transport potential of the Yankee Fork in the affected reach upstream; this could lead to sedimentation. Since the Yankee Fork is a moderately steep channel, the backwater effect would be relatively low and not extend far upstream. The physical barrier created by the weir would block sediment and debris coming downstream. The potential for the bridge weir to trap sediment and debris is most likely to occur during the high-flow months of late spring and early summer. Because of this, the bridge and picket panels would be rotated out of the channel during high-flow months to an elevation 2 feet above the 100-year flood elevation, leaving only the weir sill and abutments in place. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. Furthermore, a jib crane would be permanently installed adjacent to the bridge weir and would be used to remove debris from the weir that may accumulate during low-flow conditions. These measures would prevent the weir from creating a major flow obstruction that would lead to problematic sedimentation or debris accumulation. Any sediment that deposits upstream of the weir during low-flow conditions would likely be quickly transported out of the reach with the return of higher flows.

The concrete abutments and sill forming the foundation of the proposed bridge weir have the potential to create flow obstructions and hydraulic conditions that promote bed sediment scour at the weir. If the bed scours deep enough it could lead to undermining and destabilization of the weir structure. Project design measures would be used to minimize risk of seismic impacts, soil settlement and depletion, and channel scour to negligible levels. Therefore, the impacts from the operations of the Yankee Fork weir facility on geology and soils would be **low**.

#### Wild and Scenic Rivers Act

##### *Geology ORV*

The geology of the Yankee Fork site would not be affected by Alternative 1. Views of the geology of the canyon below the proposed facility would not be affected, and impacts on the view of the geology would be limited to when users are travelling downstream on Yankee Fork Road through the scenic transition of the valley (with its human occupation evident) to the canyon (where human occupation is absent). While the Yankee Fork weir facility would be the last constructed facility visible to upstream canyon-forming geologic features, the visual impacts of this facility is likely to have a negligible impact on river users and is expected to have **no** impact on the geology ORV as it relates to the eligibility determination for this river segment.

### Panther Creek Weir Facility

#### Construction

A geotechnical engineering evaluation was performed for the Panther Creek site to explore the subsurface conditions at the proposed improvements and provide geotechnical recommendations to assist planning, design, and construction (STRATA 2013).

Procedures outlined in Section 1615.1 of the 2009 IBC (International Code Council 2009) were used to evaluate site ground motions and design spectral response accelerations to determine the required seismic standards to use in the design of the facilities (STRATA 2013). A site-specific seismic response study was not performed due to the high cost and because it is not required if the design follows the IBC design criteria for the seismic zone in which the proposed weir site is located (Reiser pers. comm. 2015b). Seismic spectral acceleration values used in the design for short period ($S_s$) and 1-second period ($S_1$) were 0.6 and 0.196, respectively. Site Class C properties were used as the basis for structural seismic design with short ($S_{DS}$) and 1-second period ($S_{D1}$) design spectral accelerations values of 0.5 and 0.209, respectively. This design procedure seems to indicate that there is low potential for seismic impacts on facilities at the site.

Cutting into steep slopes would increase the potential for slope oversteepening and instability; however, construction of the Panther Creek facility would not require cutting into steep slopes. The facilities constructed for Alterative 1, including adult holding ponds, a spawning and egg preparation structure, acclimation ponds, a pump station and valve vault, and an in-stream intake structure, would be constructed on a generally flat terrace landform and away from the steep hillslope to the west.

The geotechnical engineering report states that all undocumented fill beneath structures should be removed to expose native soils (STRATA 2013). The majority of the existing fill is anticipated to be shallow and removed during stripping of topsoil, which only extends 3 to 6 inches below grade (STRATA 2013). Dense native gravel with varying silt content is anticipated to be exposed in footing, slab excavations, and at access road subgrades. The subgrade for all structures would need to extend to undisturbed native gravel. If native gravel with varying silt content is disturbed during excavation, it would be necessary to recompact the native gravel to structural fill criteria (STRATA 2013).

Construction of the new site facilities for Alternative 1 would result in conversion of 0.29 acres of existing soil surfaces into human-made surfaces that would result in the loss of soil resources. Most of the conversion would be due to the construction of gravel surfaces for the acclimation and adult holding area. Additional conversion would be due to concrete poured for construction of portions of the holding area that do not use gravel.

Soil erosion could occur at the Panther Creek facility on fresh cut ground or areas where hydrologic runoff patterns are altered due to grading and new site infrastructure (e.g., channelized flow, slope oversteepening) that would result in the loss of soil resources. The potential for soil erosion is considered low due to the generally flat topography at the site, the coarse alluvium that makes up the terrace where construction would occur, and the limited amount of new impervious surface that would be created. Therefore, impacts from the construction of the Panther Creek facility on geology and soils would be **low**.

#### Operations

Aerial photographs show very little lateral movement in the channel between 1998 and 2004. The channel is constrained by sections of riprap along its western bank, which parallels Panther Creek Road. No lateral movement and migration into the terrace feature along the channel's eastern bank is evident from the aerial photographs. Furthermore, the existing bridge a short distance upstream of the proposed weir would also limit channel migration in the vicinity. Future channel migration would be most likely to occur on the east bank, which is not along Panther Creek Road. Migration into the east bank could damage the bridge weir abutments and make the weir non-functional.

The proposed bridge weir would create a backwater effect while operating with the bridge and picket panels deployed in the channel by increasing depths and reducing flow velocities. The backwater effect would reduce the sediment transport potential of Panther Creek in the affected reach upstream, which could lead to sedimentation. Since Panther Creek is a moderately steep channel the backwater effect would be relatively minor and not extend far upstream. The physical barrier created by the weir would block sediment and debris coming downstream. These impacts would be most pronounced during high-flow events when the most sediment is transported by Panther Creek. The potential for the bridge weir to trap sediment and debris is most likely to occur during the high-flow months of late spring and early summer. Because of this, the bridge and picket panels would be rotated out of the channel during high-flow months to an elevation 2 feet above the 100-year flood elevation, leaving only the weir sill and abutments in place. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. Furthermore, a jib crane would be permanently installed adjacent to the bridge weir and would be used to remove debris from the weir that may accumulate during low-flow conditions. These measures would prevent the weir from creating a major flow obstruction that would lead to problematic sedimentation or debris accumulation. Any sediment that deposits upstream of the weir during low-flow conditions would likely be quickly transported out of the reach with the return of higher flows.

The concrete abutments and sill forming the foundation of the proposed bridge weir have the potential to create flow obstructions and hydraulic conditions that promote bed sediment scour at the weir. If the bed scours deep enough it could lead to undermining and destabilization of the weir structure. Project design measures would be used to minimize risk of seismic impacts, soil settlement and depletion, and channel scour to negligible levels. Therefore, impacts from the operations of the Panther Creek facility on geology and soils would be **low**.

#### Wild and Scenic Rivers Act

##### *Geology ORV*

The geology of the Panther Creek site would not be affected by Alternative 1. Views of the geology of the canyon downstream or upstream of the proposed facility would not be affected. The only possibility of an effect would be at the facility itself, and this location does not include any geologic features that the USFS likely recognizes as outstandingly remarkable when Panther Creek, as a whole, was determined eligible for Wild and Scenic River consideration. Therefore there is no impact on the geology ORV as it relates to the eligibility determination of Panther Creek.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, Alternatives, Including the Proposed Action, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, impacts on geology and soils associated with construction of the hatchery facilities would be the same as Alternative 1. Similar to full production, project design measures would be implemented to minimize risks of seismic impacts, soils settlement, and soil depletion to ***low*** impact levels.

Although production of Chinook salmon would be reduced by 50%, operational impacts on geology and soils at the Crystal Springs hatchery site would be similar to that described for full production under Alternative 1. Regardless of the production level, hatchery operations would not affect soil slope stability, soil settlement, soil depletion, and erosion, a **low** impact.

#### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, impacts on geology and soils associated with construction of the weir facilities would be the same as full production. Similar to full production, project design measures would be implemented to minimize risks of seismic impacts, soils settlement, and soil depletion to ***low*** impact levels.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock are representative of the genetic makeup of the natural-production fish population.) Similar to full production, weir facility operations would include measures to minimize the risk of sedimentation and channel scour in Yankee Fork and Panther Creek, resulting in a **low** impact.

## 3.3.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with geology and soils at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

#### Construction

Because Alternative 2 would not entail construction of a permanent weir facility, the footprint of vegetation removal and loss of pervious surfaces is much less than Alternative 1. Thus, the potential for soil erosion due to increased runoff is lower for Alternative 2 and erosion control measures would not be needed.

#### Operations

Because Alternative 2 would not create a permanent bridge weir in the channel, the environmental consequences described for Alternative 1 related to channel migration, sedimentation, debris blockage, and scour are much less likely to occur. Continued use of a temporary picket weir would allow for flexibility in how the weir is installed each season to adapt to changing channel conditions. The length of the weir could be adjusted to accommodate for potential channel migration, and because the weir would not be a permanent feature in the channel, it would not be affected by channel scour. Previous operation of the weir has not led to sedimentation or debris blockage problems (Stone pers. comm. 2015c). Therefore, the installation and operation of a temporary structure that could be modified due to changing channel conditions coupled with project design measures and construction BMPs is expected to have **low** impacts on geology and soils.

#### Wild and Scenic Rivers Act

##### *Geology ORV*

The potential impacts on the Yankee Fork site geology ORV would be the same as under Alternative 1. The only possibility of an effect would be at the facility itself, and this location does not include any geologic features that the USFS likely recognizes as outstandingly remarkable. While the Yankee Fork weir facility would be the last constructed facility visible to upstream canyon-forming geologic features, the visual impacts of this facility is likely to have a **low** impact on the river users and is not expected to have an effect on the geology ORV as it relates to the eligibility determination for this river segment.

### Panther Creek Weir Facility

#### Construction

Because Alternative 2 would not entail construction of a permanent weir facility, the footprint of vegetation removal and loss of pervious surfaces is much less than Alternative 1. Thus, the potential for soil erosion due to increased runoff is much less for Alternative 2 and erosion control measures would not be needed. Impacts on the geology and soils resource would be **low**.

#### Operations

Because Alternative 2 would not create a permanent bridge weir in the channel, the environmental consequences described for Alternative 1 related to channel migration, sedimentation, debris blockage, and scour are much less likely to occur. Proposed use of a temporary picket weir would allow for flexibility in how the weir is installed each season to adapt to changing channel conditions. The length of the weir could be adjusted to accommodate for potential channel migration, and because the weir would not be a permanent feature in the channel, it would not be affected by channel scour. Previous operation of a similar weir at the Yankee Fork site has not led to sedimentation or debris blockage problems (Stone pers. comm. 2015c). Therefore, the installation and operation of a temporary structure that could be modified due to changing channel conditions coupled with project design measures and construction BMPs is expected to have **low** impacts on geology and soils.

#### Wild and Scenic Rivers Act

##### *Geology ORV*

The potential impacts on the Panther Creek site geology ORV would be the same as under Alternative 1. The only potential effect would be at the facility itself, and this location does not include any geologic features that the USFS likely recognizes as outstandingly remarkable when Panther Creek, as a whole, was determined eligible for Wild and Scenic River consideration. Therefore there is no impact on the geology ORV as it relates to the eligibility determination of Panther Creek.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand. As a result, there would be **no** construction-related impacts on geology and soils.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operate for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock are representative of the genetic makeup of the natural-production fish population.) Due to the absence of permanent weir structures in the stream channel, the impact on geology and soils would be **low**.

## 3.3.3 Mitigation

The Shoshone-Bannock Tribes would implement the following mitigation measures to avoid or minimize impacts associated with geology and soils during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.3.3.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Construction

##### Crystal Springs Hatchery Site

Implement the following mitigation measures to reduce construction-related impacts on geology and soils at the Crystal Springs hatchery site:

- Silty sand and sand with gravel at the site would be reused as structural fill if it meets certain requirements outlined in the geotechnical engineering report, especially if the earthwork is conducted during dry weather (STRATA 2012a).
- The topsoil at the site is not suitable for use as structural fill or to bear structures (STRATA 2012a). Therefore, it would be excavated, removed, and stockpiled for reuse as landscape fill (which would minimize soil resource depletion) or removed from the site (STRATA 2012a). The extent of reuse of on-site soils would be determined during construction. There is potential to reuse excavated material at the outdoor tank area and for some of the minor road fills for the residence drives (Reiser pers. comm. 2015b).
- The design would maximize use of pervious gravel instead of impervious concrete for the constructed surfaces. This would retain a large portion of site infiltration capacity, thereby limiting increased stormwater runoff that could result in increased soil erosion.
- The hatchery would be constructed using standard erosion control measures and best management practices according to the guidelines of the *ITD Sediment and Erosion Control Manual*. Prior to construction, the contractor would submit an erosion and sediment control plan, signed and stamped by a registered civil engineer, that meets all federal, state, and local requirements. Specific erosion control measures for the hatchery site for Alternatives 1 and 2 are described in Appendix C. For additional information on the potential environmental consequences of soil erosion on water quality and fish, see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, and Section 3.7, *Fish*.
- Shallow groundwater would likely be encountered, particularly during spring snowmelt, and any excavation extending below anticipated groundwater levels would incorporate a dewatering plan (STRATA 2012a).
- Site excavations would be sloped in accordance with the Occupational Safety and Health Administration regulations and local codes (STRATA 2012a).
- Construction activities, particularly earthwork, would be performed as rapidly as possible and/or during drier, low flow conditions (late summer and fall) to reduce the potential for remedial earthwork (STRATA 2012a).

- The 2009 IBC would be utilized for project structural design. Section 1615.1 of the 2009 IBC outlines the procedure for evaluating site ground motions and design spectral response accelerations (STRATA 2012a). STRATA (2012a) recommend a Site Class D be utilized as a basis for structural seismic design.

#### Yankee Fork and Panther Creek Weir Facilities

Implement the following mitigation measures to reduce construction-related impacts on geology and soils at the Yankee Fork and Panther Creek weir facilities:

- Shallow groundwater would likely be encountered, particularly during spring snowmelt, and any excavation extending below anticipated groundwater levels would incorporate a dewatering plan (STRATA 2012b; STRATA 2013).
- Site excavations would be sloped in accordance with the Occupational Safety and Health Administration regulations and local codes (STRATA 2012b; STRATA 2013).
- Construction activities, particularly earthwork, would be performed as rapidly as possible and/or during drier, low flow conditions (late summer and fall) to reduce the potential for remedial earthwork (STRATA 2012b; STRATA 2013).
- Topsoil and soil containing significant vegetation and organics is not suitable for use as structural fill or to bear structures over. As such, it would be excavated, removed, and stockpiled for reuse as landscape fill, or removed from the site (STRATA 2012b; STRATA 2013).
- The on-site silty gravel and poorly graded gravel with sand and silt would be reused as general structural fill provided it meets the requirements (STRATA 2012b; STRATA 2013).
- Riprap or coarse alluvium would be placed next to the bridge weir abutments to protect against bank erosion and damage to the abutment. This would not protect against lateral migration that occurs upstream of the bridge weir. Riprap or other bank stabilization material could be extended further up the channel to provide additional bank protection. However, this may be unnecessary as the existing bridge a short distance upstream of the proposed weir may limit future migration in the bridge weir vicinity.

### Operations

#### Crystal Springs Hatchery Site

Implement the following mitigation measures to reduce operations impacts on geology and soils at the Crystal Springs hatchery site:

- To protect against potential soil erosion, a Stormwater Pollution Prevention Plan that meets the Environmental Protection Agency's erosion and stormwater control BMPs would be implemented and stormwater runoff from the site would be attenuated by being channeled through a concrete dual-chambered settling pond before being combined with overflow drains that would discharge through an approximately 180-foot-long pipe into McTucker Creek.
- As previously described in Section 3.3.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, the increase in flow to McTucker Creek due to hatchery operations would be expected to result in increased overbanking and ponding of water instead of increased channel velocities with the potential to erode the channel. Channel conditions in McTucker Creek would be visually monitored during operations to ensure that no adverse erosion is occurring due to the

increased discharge. If erosion is detected, then appropriate response measures would need to be developed to avoid further erosion.

#### Yankee Fork and Panther Creek Weir Facilities

The potential for bridge scour would be most likely to occur during the high-flow months when Panther Creek has the most energy. During high flows the concrete weir sill and abutments would be the only part of the bridge weir in place in the channel. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. No scour analysis was performed on the design; however, this configuration of the weir foundation would minimize scour and maintain the channel at the same approximate elevation (Reiser pers. comm. 2015b). If scour were to become problematic, then riprap or coarse alluvium could be placed on the bed to protect the sill and abutments.

## 3.3.3.2 Alternative 2: Hatchery Program with Temporary Weirs

### Construction

#### Crystal Springs Hatchery Site

Implement the same mitigation measures recommended under Alternative 1 for the Crystal Springs hatchery.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation would be recommended.

### Operations

#### Crystal Springs Hatchery Site

Implement the same mitigation measures recommended under Alternative 1 for the Crystal Springs hatchery.

#### Yankee Fork and Panther Creek Weir Facilities

Scour is unlikely to occur under Alternative 2 since permanent weir facilities would not be constructed. No mitigation would be required.

# 3.3.4 No Action Alternative

Under the No Action Alternative, the Crystal Springs hatchery and Yankee Fork and Panther Creek weir facilities would not be constructed. Existing conditions would continue, and no geologic or soil resource impacts would occur on the site. Impacts on geology and soils under the No Action Alternative would be **low**.

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# 3.4 Vegetation

This section describes the affected environment and environmental consequences, including mitigation measures, associated with vegetation resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level and a 50% production level.

## 3.4.1 Affected Environment

The analysis area for direct impacts on vegetation is limited to the individual sites proposed for the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility. The analysis area for indirect impacts on vegetation includes these sites and adjacent areas within 200 feet of each site, as well as lowland areas between the site and the American Fork Reservoir. For both the Yankee Fork and Panther Creek sites, which are located alongside streams, the analysis area for indirect impacts on vegetation also extends 0.25 mile downstream of each site (see Section 3.17, *Cumulative Impacts*).

The following sections describe the existing vegetation resources of the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites that could be affected by the Hatchery Program. To provide some context on the environmental conditions that can influence vegetation, there is a brief description of the physical geography, climate, typical land use, characteristic vegetation, and level of disturbance for each site. This is followed by a description of the vegetation cover types currently present at each site, including acreage and relative cover estimates for each identified cover type. The potential for each site to support special-status plant species is also assessed. For the purposes of this analysis, special-status plant species include species that have been identified for protection under the Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.), and species that the Idaho Natural Heritage Program (IDNHP) has designated as critically imperiled (S1), imperiled (S2), or vulnerable (S3). For the Yankee Fork and Panther Creek sites, which are both located in the Salmon-Challis National Forest, USFS Region 4 sensitive species are discussed. The presence of federal and state-listed noxious weeds on each site is also addressed.

### 3.4.1.1 Crystal Springs Hatchery Site

The Crystal Springs hatchery site is located in the Upper Snake River Plain subregion of the Snake River Plain ecoregion (McGrath et al. 2002: 1). This ecoregion is part of the xeric intermontane west geographic region. It lies adjacent to Fort Hall Bottoms, a complex of sloughs, drainages, and wetlands that border the Snake River at the northeastern end of American Falls Reservoir, and is within the American Falls Reservoir Watershed of the Snake River subbasin, which is identified by the U.S. Geological Survey as Hydrologic Unit Code (HUC) 17040206. The site consists of an approximately 19.7-acre property owned by the BPA that is located in a predominantly agricultural area (McGrath et al. 2002). Average minimum and maximum temperatures range from 32° to 60° F, occurring December-January and July-August, respectively (Western Regional Climate Center 2015a). Average annual precipitation is approximately 11 inches, with the highest rainfall occurring between October and June.

The Upper Snake River Plain subregion was historically occupied by a sagebrush-steppe community (McGrath et al. 2002: 2). Its current land use is primarily agricultural, including extensive surface irrigated grain, sugar beets, potatoes, and alfalfa. When present, native vegetation includes big sagebrush (*Artemisia tridentata*), bluebunch wheatgrass (*Pseudoroegneria spicata*), bluegrass (*Poa* sp.), cheatgrass (*Bromus tectorum*), rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), squirreltail grass (*Elymus elymoides*), needle and threadgrass (*Hesperostipa comata*), Indian ricegrass (*Achnatherum hymenoides*), and flowering saltbrush (*Atriplex canescens*).

The Crystal Springs hatchery site has been previously disturbed by agricultural activities and by the construction and operation of a former trout hatchery. Vegetation cover includes a former hay field in the northwestern portion, sagebrush-dominated shrubland in the central portion, and a series of excavated ponds and wetlands in the eastern and southern portions. Surrounding land use includes former and actively cultivated agricultural land to the north, east, and west, and mixed shrubland, grasslands, and riparian areas to the south.

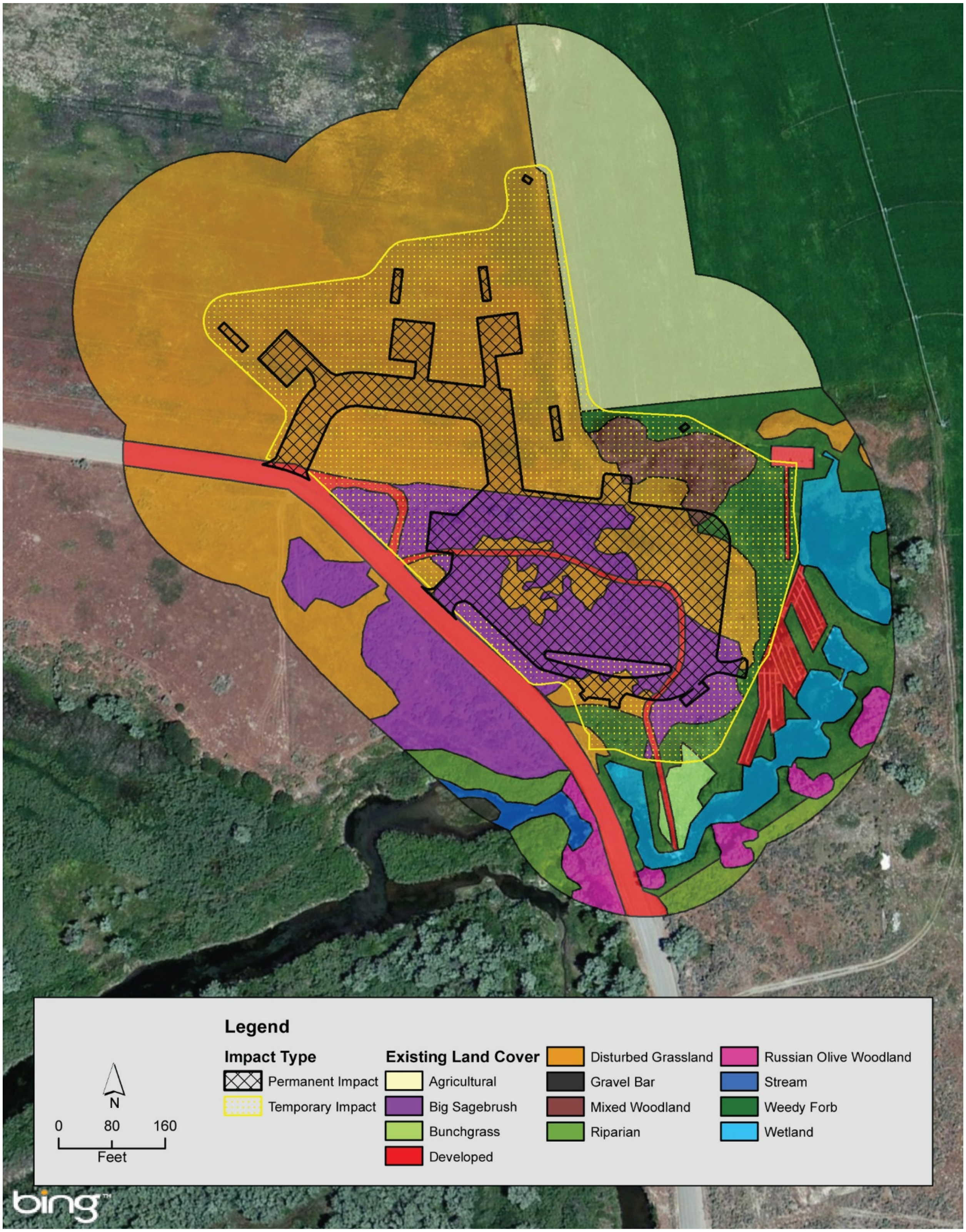
## Vegetation Cover Types

Vegetation cover types were identified and mapped for the Crystal Springs hatchery site during a June 10, 2014, site visit. As shown in Table 3.4-1, 12 cover types were identified at the Crystal Springs hatchery site. Each of these is briefly described in the following sections and their locations are shown on Figure 3.4-1.

**Table 3.4-1. Vegetation Cover Types Present at the Crystal Springs Hatchery Site**

| Vegetation Cover Type | Area (Acres) | Percent Cover |
|---|---|---|
| Big Sagebrush | 3.25 | 13 |
| Disturbed Grassland | 11.02 | 46 |
| Bunchgrass Grassland | 0.15 | 1 |
| Weedy Forb | 2.23 | 9 |
| Mixed Woodland | 0.43 | 2 |
| Russian Olive Woodland | 0.42 | 2 |
| Agricultural | 3.02 | 13 |
| Riparian | 0.57 | 2 |
| Pond/Wetland | 1.07 | 4 |
| Stream | 0.28 | 1 |
| Gravel Bar | 0.05 | 0 |
| Developed | 1.54 | 6 |
| Total | 24.02 | 100 |

**Figure 3.4-1. Existing Cover Types and Permanent and Temporary Impacts at the Crystal Springs Hatchery Site**



### Big Sagebrush

The big sagebrush cover type occurs in the central and southeastern portions of the Crystal Springs hatchery site and occupies 3.25 acres (13%) of the total site area (Figure 3.4-1). It is dominated by big sagebrush (*Artemisia tridentata*) and cheatgrass (*Bromus tectorum*). Scattered rubber rabbitbrush (*Ericameria nauseosa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), and sand sagebrush (*Artemisia filifolia*) shrubs are also present. Other herbaceous species present include hoary cress (*Cardaria draba*), common tansy (*Tanacetum vulgare*), western salsify (*Tragopogon dubius*), yellow sweetclover (*Melilotus officinalis*), and musk thistle (*Carduus nutans*). Rush skeleton weed (*Chondrilla juncea*) occurs along the edges of the onsite roads in several locations. A few scattered Russian olive (*Elaeagnus angustifolia*) trees are also present.

### Disturbed Grassland

The disturbed grassland cover type occurs in scattered locations throughout the Crystal Springs hatchery site, often intermixed with the big sagebrush cover type (Figure 3.4-1). It occupies 11.02 acres (46%) of the site, with the largest areas located in the northwest, northeast, and central portions. It is dominated by cheatgrass and rush skeleton weed, with clasping pepperweed (*Lepidium perfoliatum*), common yarrow (*Achillea millefolium*), hoary cress, bluebunch wheatgrass (*Pseudoroegneria spicata*), western wheatgrass (*Pascopyrum smithii*), and quackgrass (*Elymus repens*) also present.

### Bunchgrass Grassland

There is a small area dominated by native bluebunch wheatgrass in the southern portion of the site (Figure 3.4-1). This area occupies 0.15 acres (1%) of the Crystal Springs hatchery site. Hoary cress and other scattered weedy species are also present in this area.

### Weedy Forb

The weedy forb cover type occurs throughout the northern portion of the Crystal Springs hatchery site, around the former hatch house and raceways, and in multiple locations around the onsite ponds (Figure 3.4-1). It occupies 2.23 acres (9%) of the site. Dominant vegetation includes musk thistle, Canada thistle (*Cirsium arvense*), and stinging nettle (*Urtica dioica*). Other common species include bluebunch wheatgrass, cheatgrass, rush skeleton weed, hoary cress, clasping pepperweed, western wheatgrass, houndstongue (*Cynoglossum officinale*), quackgrass, and common cocklebur (*Xanthium strumarium*).

### Mixed Woodland

The mixed woodland cover type is located in the north-central portion of the Crystal Springs hatchery site and occupies 0.43 acres (2%) (Figure 3.4-1). It includes a small group of trees dominated by a few large Siberian elm (*Ulmus pumila*), with scattered Russian olive in the understory. Dominant vegetation in the herbaceous layer includes quackgrass, musk thistle, and Canada thistle. Stinging nettle and bluebunch wheatgrass are also common. Several snags are also in this area.

### Russian Olive Woodland

The Russian olive woodland cover type is located along the eastern shoreline of the former hatchery ponds and along the south side of River Road near the culvert that drains into a side channel of McTucker Creek (Figure 3.4-1). It consists of several small clumps of Russian olive trees, with cheatgrass, Canada thistle, musk thistle, quackgrass, bluebunch wheatgrass, and stinging nettle in the understory. This cover type occupies 0.42 acres (2%) of the Crystal Springs hatchery site.

### Agricultural

The agricultural cover type is located in the northeast corner of the Crystal Springs hatchery site on an adjacent property to the east (Figure 3.4-1). It occupies 3.02 acres (13%) of the site and consists of surface irrigated row crops. Potatoes were being grown in this area at the time of the June 2014 site visit.

### Riparian

The riparian cover type occurs in the southwestern portion of the Crystal Springs hatchery site along the short drainageway that flows into McTucker Creek (Figure 3.4-1). It occupies 0.57 acres (2%) of the site and is dominated by upland shrubs and weedy forbs. Species present include willow (*Salix* sp.), Russian olive, rose (*Rosa* sp.), cheatgrass, musk thistle, and various grasses.

### Pond/Wetland

The pond/wetland cover type includes the five former hatchery ponds and their associated adjacent wetlands (Figure 3.4-1). It occupies 1.07 acres (4%) of the site on the eastern and southern portions of the property. Along the bank and upper edges of the ponds are scattered willow, rose, gooseberry (*Ribes* sp.), boxelder (*Acer negundo*), trailing nightshade (*Solanum dulcamara*), stinging nettle, willowherb (*Epilobium* sp.), cheatgrass, bluebunch wheatgrass, western wheatgrass (*Pascopyrum smithii*), musk thistle, and Canada thistle. Scattered individuals of wild licorice (*Glycyrrhiza lepidota*), showy milkweed (*Asclepias speciosa*), and yellow sweetclover (*Melilotus officinalis*) are also present. Seasonally saturated and shallow ponded areas around the perimeter of the ponds contain watercress (*Nasturtium officinale*), American speedwell (*Veronica americana*), and creeping spikerush (*Eleocharis palustris*). Patches of common cattail (*Typha latifolia*) and hardstem bulrush (*Schoenoplectus acutus*) are also present. The dominant plant in permanently ponded areas is curly-leaf pondweed (*Potamogeton crispus*).

### Stream

The stream cover type consists of the portion of the unnamed side channel that occurs in the Crystal Springs hatchery site (Figure 3.4-1). This channel is unvegetated and typically carries flowing water draining from the former hatchery ponds via a culvert under the road to McTucker Creek. It occupies 0.28 acres (1%) of the site.

### Gravel Bar

The gravel bar cover type occurs in the middle of the unnamed side channel and occupies 0.05 acres (0.2%) of the Crystal Springs hatchery site (Figure 3.4-1). It is vegetated with weedy forbs and grasses.

### Developed

The developed cover type includes the existing gravel roads and former hatchery facilities including the hatch house and raceways (Figure 3.4-1). This cover type occupies 1.54 acres (6%) of the property in various places throughout the site. Most of these areas are unvegetated, with the exception of the abandoned raceways, which contain watercress, American speedwell, thistles, and various other weeds growing in accumulated sediment.

## Special Status Species

Special status plant species that have the potential to occur on the Crystal Springs hatchery site are listed in Table 3.4-2 along with their federal and state status and characteristic habitat. These species were identified using Idaho Fish and Wildlife Information System list of rare and sensitive species for Bingham County, Idaho (Idaho Fish and Wildlife Information System 2012). Species included on this list were cross-checked with the U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Consultation (IPaC) system list for Bingham County (USFWS 2015a) and IDNHP's special status vascular and nonvascular tracked plants and ranks list (IDNHP 2014).

**Table 3.4-2. Special Status Plant Species—Bingham County, Idaho**

| Common Name | Scientific Name | Federal Status[a] | State Status[b] | Characteristic Habitat |
|---|---|---|---|---|
| Meadow Milkvetch | *Astragalus diversifolius* | -- | S2 | Moist, often alkaline soil in sagebrush valleys (NatureServe 2015). |
| Red Glasswort | *Salicornia rubra* | -- | S2 | Seasonally wet, saline or alkaline places including coastal beaches and sands, inter-tidal zones, mud flats, salt marshes, and margins of alkaline lakes; also rarely naturalized in saline areas along highways (eFloras.org 2015). |
| Ute Ladies' Tresses | *Spiranthes diluvialis* | T | S1 | Moist meadows associated with perennial stream terraces, floodplains, and oxbows; seasonally flooded river terraces; sub-irrigated or spring-fed abandoned stream channels and valleys; along lakeshores (USFWS 2015b). |

Source: Idaho Fish and Wildlife Information System 2012

[a] Federal Status under the Endangered Species Act as determined by U.S. Fish and Wildlife Service (USFWS 2015a):
T = Threatened

[b] State Status of plant species as determined by the Idaho National Heritage Program (IDNHP 2014):
S1 = Critically imperiled: at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, and other factors.
S2 = Imperiled: at high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.

### Federally Listed Plant Species

According to the federal endangered species list for Bingham County, Idaho, one listed plant species, Ute ladies'-tresses (*Spiranthes diluvialis*), is considered to have the potential to occur in the vicinity of the Crystal Springs hatchery site (USFWS 2015a). Ute ladies'-tresses is an orchid that is ESA-listed as threatened and ranked as an S1 (critically imperiled) species by IDNHP. In addition to its characteristic habitat listed in Table 3.4-2, it has also been found along irrigation canals, berms, levees, irrigated meadows, excavated gravel pits, roadside borrow pits, reservoirs, and other human modified wetlands.

Based on its known habitat characteristics, Ute ladies'-tresses could potentially occur in the wetlands around the former hatchery ponds on the eastern portion of the Crystal Springs hatchery site. To date, no observations of this species have been documented on or within 1 mile of the site by IDNHP. Occurrences of this species have been documented in undisclosed locations on the Fort Hall Indian Reservation lands within a 5-mile radius of the site to the south and east.

### State Sensitive Plant Species

In addition to Ute ladies'-tresses, IDNHP lists two additional special status plant species for Bingham County: meadow milkvetch (*Astragalus diversifolius*) and red glasswort (*Salicornia rubra*). Both species are ranked as S2 (imperiled) plants by IDNHP. Meadow milkvetch is a perennial herb in the pea family that is typically found in moist alkaline meadows and swales. Red glasswort is a low-growing succulent found along the edges of alkaline lakes. As indicated, both of these species are known to occur in seasonally wet, alkaline soils, which could be present around the former hatchery ponds and associated wetlands on the eastern portion of the site.[1] No observations of either of these species have been recorded on or within 1 mile of the site by IDNHP; however, IDNHP has recorded observations of both species from a generalized area approximately 1.6 miles to the northwest of the Crystal Springs hatchery site (IDFG 2015d). These observations were last recorded in 1939 and the records indicate that both species have since been extirpated from this area. Two additional observations of red glasswort occur within 6 miles of the site to the southwest, in wetlands along the margins of American Falls Reservoir. These observations were recorded in 1997 and are described as potentially viable populations.

## Noxious Weeds

The term "noxious weed" is legally defined under federal and state laws. Under the Federal Plant Protection Act (7 U.S.C. 7701 et seq.]), a noxious weed is defined as "any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment."

In addition to federal noxious weed list (USDA 2014), Idaho Code (Title 22, Chapter 24, Noxious Weeds) designates 65 species of noxious weeds; this law is implemented by administrative rules established under the Idaho Administrative Procedures Act (IDAPA) (IDAPA 02, Title 06, Chapter 22, Noxious Weed Rules). The administrative rules place each noxious weed species into one of three categories. Each category has specific management requirements associated with detection, control, and containment of the given species. These include the following categories:

- Early Detection and Rapid Response – Plants in this category must be reported to the Idaho State Department of Agriculture within 10 days of observation. Eradication must begin in the same season in which the weed is found.
- Statewide Control – Plants in this category may already exist in some parts of the state. In some areas of the state, control or eradication may be possible, and a plan must be established that will reduce population levels within 5 years.
- Statewide Containment – Plants in this category already exist in the state. New or small infestations can be reduced or eliminated, while established populations may be managed as determined by the local weed control authority.

The Crystal Springs hatchery project area is within the Black-Snake Cooperative Weed Management Area. No federally listed noxious weeds were observed on the Crystal Springs hatchery site during the June 10, 2014, site visit; however, five species out of the 67 that are listed as noxious weeds by the state of Idaho are present. These species are summarized in Table 3.4-3 along with their state status and approximate location on the site. As indicated, one of these weeds is included on the states Control list, with the remaining four on the Contain list. No weeds on the Idaho State Department of Agriculture Early Detection and Rapid Response list were found on the site.

[1] Soil chemistry information from the Natural Resources Conservation Service's online Web Soils Survey indicates that the soil types mapped for on the Crystal Springs hatchery site are all slightly alkaline (Natural Resources Conservation Service 2015).

**Table 3.4-3. Noxious Weeds that Occur on the Crystal Springs Hatchery Site**

| Common Name | Scientific Name | State Noxious Weed List[a] | Location on Site |
|---|---|---|---|
| Musk thistle | *Carduus nutans* | Control | Around perimeter of former hatchery ponds; around former hatch house. |
| Rush skeletonweed | *Chondrilla juncea* | Contain | Along edges of gravel access roads; in disturbed area to southwest of former hatch house. |
| Canada thistle | *Cirsium arvense* | Contain | Around perimeter of former hatchery ponds; around former hatch house. |
| Houndstongue | *Cynoglossum officinale* | Contain | Scattered locations around site. |
| Curly-leaf pondweed | *Potamogeton crispus* | Contain | In former hatchery ponds. |

[a] Idaho State Department of Agriculture 2015

## 3.4.1.2 Yankee Fork Weir Facility

The proposed Yankee Fork weir facility is located in the Southern Forested Mountains subregion of the Idaho Batholith ecoregion (McGrath et al. 2002: 1). This area is characterized as being mountainous, deeply dissected, partially glaciated, and typically underlain by granitic rocks. Climate is slightly maritime and characterized by cold winters and warm, dry summers. Average minimum and maximum temperatures range from 9° to 85° F, with the coldest temperatures occurring between December and January, and the warmest between July and August (Western Regional Climate Center 2015b). Average annual precipitation is approximately 7.4 inches, with May and June being the wettest months and January to March the driest.

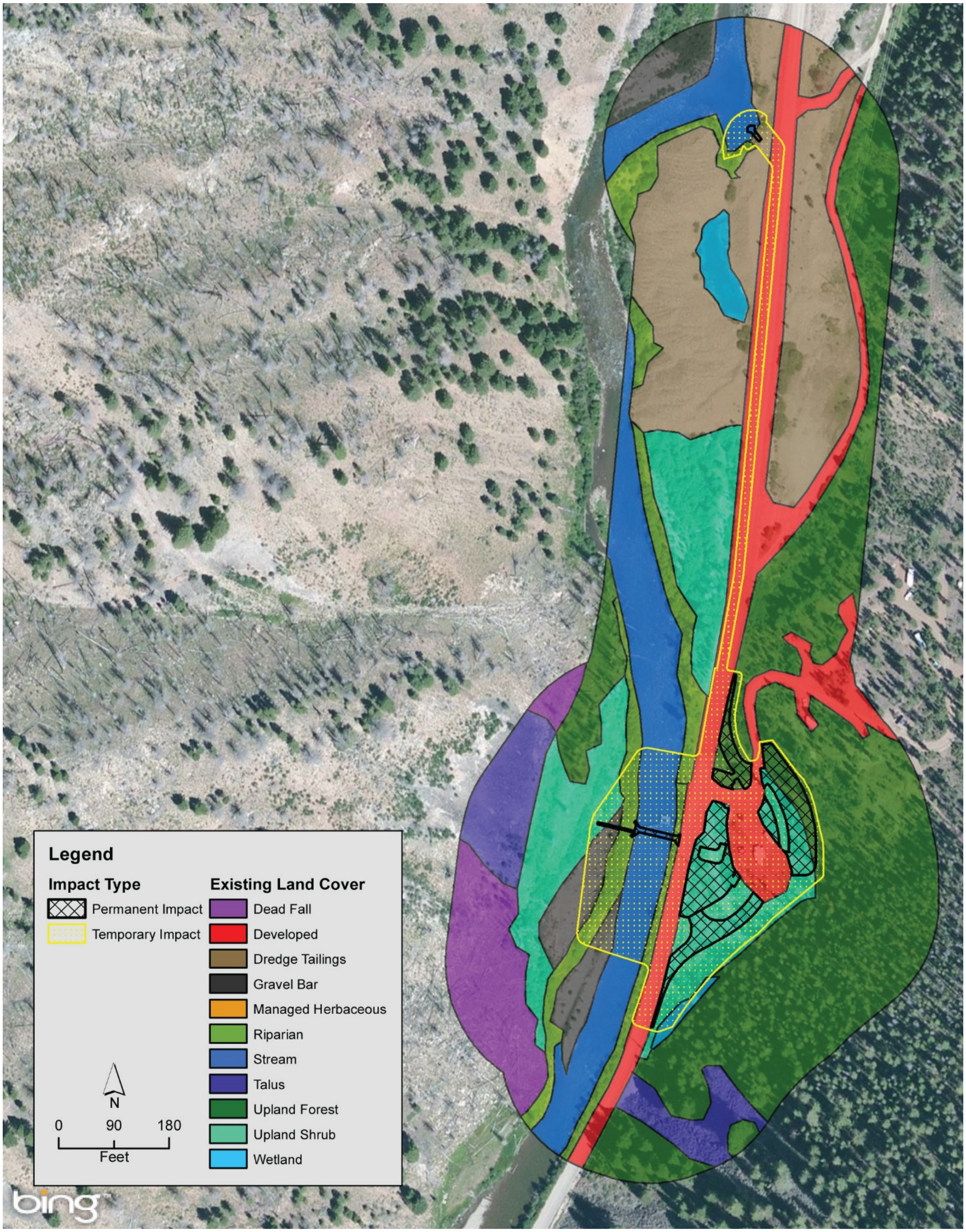
The Southern Forested Mountains subregion primarily consists of forested lands used for timber production, mining, recreation, livestock grazing, and wildlife habitat (McGrath et al. 2002: 2). Vegetation composition typically consists of grand fir (*Abies grandis*) and Douglas-fir (*Pseudotsuga menziesii*) on lower and mid-level slopes, with Englemann spruce (*Picea engelmannii*) and subalpine fir (*Abies lasiocarpa*) at higher elevations (Reclamation 2012d: 14). Lodgepole pine (*Pinus contorta*) and ponderosa pine (*Pinus ponderosa*) are found in deeper canyons along with shrubs such as mountain mahogany (*Cercocarpus ledifolius*) and grasses such as Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (McGrath et al. 2002: 2).

The Yankee Fork site has been previously disturbed by gold mining activities, road construction, and the development of adjacent recreational facilities (e.g., campgrounds). Vegetated areas within the site include narrow riparian areas along the banks of the Yankee Fork, upland and wetland shrubland located along the east side of Yankee Fork Road and around the worksite currently used by the Shoshone-Bannock Tribes (Tribes), and upland forested areas located near the Pole Flat Campground entrance and on the steeper slopes to the east. Unvegetated areas within the site include exposed gravel bars, areas of dredge tailings, the Yankee Fork channel, and existing roads and parking areas. Surrounding land cover includes forested areas and talus on the surrounding slopes to the east and west, including a previously burned area on the west side of the channel that contains a considerable number of standing snags and downed woody debris.

### Vegetation Cover Types

Vegetation cover types were identified and mapped for the site during a June 12, 2014, site visit. As shown in Table 3.4-4, 10 cover types were identified in the Yankee Fork analysis area. Each of these is briefly described in the following sections and their locations are shown in Figure 3.4-2.

**Figure 3.4-2. Existing Cover Types and Permanent and Temporary Impacts at the Yankee Fork Weir Facility**



### Riparian

The riparian cover type occurs along both sides of Yankee Fork (Figure 3.4-2). On the east bank, riparian areas are present in a narrow strip between the channel and Yankee Fork Road and at the northern tip of the site. On the right (west) bank, riparian areas occur along an exposed gravel bar. Dominant vegetation in this cover type is mountain alder (*Alnus incana*), with Geyer's willow (*Salix geyeriana*), other willows (*Salix* spp.), twinberry (*Lonicera involucrata*), swamp birch (*Betula glandulosa*), bluebunch wheatgrass, and other grasses also common. Several young lodgepole pine saplings and a few larger trees are also present along the left (east) bank. Overall, the riparian cover type occupies 1.31 acres (6%) of the Yankee Fork site.

**Table 3.4-4. Vegetation Cover Types Present at the Yankee Fork Site**

| Vegetation Cover Type | Area (Acres) | Percent Cover |
|---|---|---|
| Riparian | 1.31 | 6 |
| Wetland Scrub-Shrub | 0.19 | 1 |
| Upland Shrub | 2.66 | 12 |
| Upland Forest | 6.27 | 29 |
| Dead Fall | 1.04 | 5 |
| Stream | 2.30 | 11 |
| Gravel Bar | 0.82 | 4 |
| Dredge Tailings | 3.53 | 16 |
| Talus | 0.90 | 4 |
| Developed | 2.80 | 13 |
| Total | 21.82 | 100 |

### Wetland Scrub-Shrub

The wetland scrub-shrub cover type occurs on the east side of Yankee Fork Road, near the base of the adjoining hillside, and corresponds with Wetland Yankee-A, as described in Section 3.6, *Wetlands and Floodplains* (Figure 3.4-2). Dominant vegetation includes Geyer's willow and mountain alder, with prickly black gooseberry (*Ribes lacustre*) and tall buttercup (*Ranunculus acris*) also present. Due to the density of the shrub canopy, the herbaceous layer is mostly bare. This cover type occupies 0.19 acres (1%) of the Yankee Fork analysis area.

### Upland Shrub

The upland shrub cover type occurs along both sides of the Yankee Fork channel, near the base of slopes and along the east side of Yankee Fork Road, between the roadway and the wetland scrub-shrub cover type, and around the worksite currently used by the Tribes for fish trapping operations (Figure 3.4-2). Dominant vegetation in this area includes Geyer's willow, other willows, quaking aspen (*Populus tremuloides*), stinging nettle, starry Solomon's seal (*Smilacina stellata*), Idaho bentgrass (*Agrostis idahoensis*), and other grasses. Much of this area appears to have been logged in the past and portions may have been affected by previous wildfires as there are a few standing snags with burn scars. The upland shrub cover type occupies 2.66 acres (12%) of the Yankee Fork analysis area.

#### Upland Forest

The upland forest cover type occurs along the eastern edge of the Yankee Fork site on the lower portions of the adjacent slope and around the intersection of Yankee Fork Road and the Pole Flat Campground access road (Figure 3.4-2). The dominant vegetation is lodgepole pine, with some quaking aspen, mountain alder, bluebunch wheatgrass, and other grasses in the understory. The upland forest cover type occupies 6.27 acres (29%) of the Yankee Fork analysis area.

#### Dead Fall

The dead fall cover type is located along the west side of the stream channel in the southwestern portion of the Yankee Fork analysis area (Figure 3.4-2). It consists of a former forested area that previously burned and is now dominated by downed timber and scattered herbaceous vegetation. The dead fall cover type occupies 1.04 acres (5%) of the Yankee Fork analysis area.

#### Stream

The stream cover type occurs in the Yankee Fork channel and occupies 2.30 acres (11%) of the Yankee Fork analysis area. No aquatic or emergent vegetation is present within the channel banks.

#### Gravel Bar

Areas of exposed gravel bar occur within the 100-year floodplain of Yankee Fork, along the right (west) bank at the downstream end of the Yankee Fork analysis area (Figure 3.4-2). These areas cover 0.82 acres (4%) of the Yankee Fork analysis area and contain scattered willows and grasses.

#### Dredge Tailings

The dredge tailings cover type is located at the northern end of the Yankee Fork analysis area and consists of cobble and large gravels that remained along the stream banks following gold dredging activities in the 1940s and 1950s (Figure 3.4-2). This area is largely unvegetated and covers 3.53 acres (16%) of the Yankee Fork analysis area.

#### Talus

The talus cover type is located near the toe of the slope in two locations along both sides of the Yankee Fork channel (Figure 3.4-2). It consists of a relatively open area occupied by an accumulation of rock and gravel and occupies 0.90 acres (4%) of the Yankee Fork analysis area.

#### Developed

The developed cover type includes existing paved and gravel roads (Yankee Fork and Pole Creek) and the worksite currently used by the Tribes (Figure 3.4-2). As such, it is unvegetated. It covers 2.80 acres (13%) of the Yankee Fork analysis area and is the predominant cover type at the site.

### Special Status Species

Special status plant species that have the potential to occur on the Yankee Fork site are listed in Table 3.4-5 along with their federal and state status and characteristic habitat. This site-specific species list was obtained from the USFS Challis–Yankee Fork Ranger District for the South Zone of the Salmon-Challis National Forest (Purvine pers. comm.). Species included on this list were cross-checked with USFWS IPaC system list for Custer County, Idaho (USFWS 2015c) and IDNHP's special status vascular and nonvascular tracked plants and ranks list (IDNHP 2014).

### Federally Listed Plant Species

According to the ESA list for Custer County, Idaho (USFWS 2015c), there is one plant species that is a candidate for listing under ESA: whitebark pine (*Pinus albicaulis*). Whitebark pine is a hardy conifer found at the alpine tree line and subalpine elevations on rocky, poorly developed soils (USFWS 2013). Such habitat does not occur at the Yankee Fork site, which is located at the bottom of a river valley, well below the alpine and subalpine zones.

### USFS Region 4 Sensitive Plant Species and State Sensitive Plant Species

As shown in Table 3.4-5, six USFS Region 4 sensitive plant species are known to occur in the South Zone of the Salmon-Challis National Forest. IDNHP has no records of any these species occurring within 10 miles of the Yankee Fork site (IDFG 2015d). Based on the types of habitat present, it is unlikely that any of these plants would occur on the site. Three of these species—White Cloud milkvetch (*Astragalus vexilliflexus* var. *nubilus*), Douglas' biscuitroot (*Cymopterus douglasii*), and Marsh's bluegrass (*Poa abbreviata* ssp. *Marshii*)—grow in alpine and subalpine zones, which are not present at the Yankee Fork site. Challis crazyweed (*Oxytropis besseyi* var. *salmonensis*) grows in sagebrush and salt desert habitats, neither of which occurs on the site. Lemhi milkvetch (*Astragalus aquilonius*) and wavy-leaf thelypody (*Thelypodium repandum*) are both found in unstable substrates on moderate to steep slopes. While such slopes do exist in adjacent areas to the west of the site, they do not occur within the footprint of the proposed weir facility.

### Management Indicator Species

USFS does not currently identify any plants as Management Indicator Species under the Challis Land and Resource Management Plan for the Challis portion of the Salmon-Challis National Forest. All plant Management Indicator Species in the Salmon-Challis National Forest were replaced with fish and wildlife species in a 2004 amendment to the Land and Resource Management Plans (USFS 2004c).

## Noxious Weeds

In their February 2015 *Salmon-Challis National Forest Invasive Plant Treatment Draft Environmental Impact Statement*, USFS maps a noxious weed infestation of spotted knapweed (*Centaurea stoebe*) along Yankee Fork Road that extends from State Route 75 through the Yankee Fork site and past the road to the Pole Flat Campground (USFS 2015a: Map 5). Spotted knapweed is listed on the state's Contain list. No other noxious weed infestations are mapped for this area.

No individuals of any state-listed noxious weeds were observed on the site during the June 12, 2014, site visit.

**Table 3.4-5. Special Status Plant Species—Salmon-Challis National Forest, South Zone**

| Common Name | Scientific Name | Federal Status[a] | State Status[b] | Characteristic Habitat |
|---|---|---|---|---|
| Lemhi milkvetch | *Astragalus aquilonius* | R4 | S3 | Unstable substrates, steep banks, sandy washes, and gullies in the shrub-steppe zone, often on southerly aspects in gravelly and sandy to ashy soils. |
| White Cloud milkvetch | *Astragalus vexilliflexus* var. *nubilus* | R4 | S2 | Dry open ridges in White Cloud Range at alpine and subalpine elevations. |
| Douglas' biscuitroot | *Cymopterus douglasii* | R4 | S3 | Alpine and subalpine areas on open slopes, ridges, and summits in calcareous or dolomitic substrates. |
| Challis crazyweed | *Oxytropis besseyi* var. *salmonensis* | R4 | S3 | Sagebrush and salt desert shrub in sandy washes or open slopes of rocky volcanic soil. |
| Whitebark Pine | *Pinus albicaulis* | C | S3 | Highest elevation forest and at timberline in alpine and subalpine zones. |
| Marsh's bluegrass | *Poa abbreviata* ssp. *Marshii* | R4 | S1 | Alpine fell-fields. |
| Wavy-leaf thelypody | *Thelypodium repandum* | R4 | S3 | Moderate to steep, unstable, generally southerly facing slopes of rocky, gravelly to cindery substrate derived from Challis volcanic and metamorphic rock. Associated vegetation is sparse and bare ground coverage is high. |

Source: U.S. Forest Service, Challis-Yankee Fork Ranger District (Purvine pers. comm.)

[a] Federal Status under the Endangered Species Act determined by U.S. Fish and Wildlife Service (USFWS 2015c):
C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened
R4 = USFS Region 4 Sensitive Species

[b] State Status of plant species as determined by Idaho National Heritage Program (IDNHP 2014):
S1 = Critically imperiled: at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, and other factors
S2 = Imperiled: at high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors
S3 = Vulnerable: at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors

### 3.4.1.3 Panther Creek Weir Facility

The proposed Panther Creek weir facility is also located in the Southern Forested Mountains subregion of the Idaho Batholith ecoregion and has similar geologic and climatic conditions to the Yankee Fork site (McGrath et al. 2002). Average minimum and maximum temperatures at the Panther Creek weir facility range from 7° to 84° F, with the coldest temperatures occurring between December and January, and the warmest between July and August (Western Regional Climate Center 2015c). Average annual precipitation is approximately 17.5 inches, with most occurring in May and June. Snowfall is the predominant form of precipitation in the area.

Much of this region is forested and used for timber production, mining, recreation, and wildlife habitat. Forested areas are dominated by conifers interspersed with clumps or stringers of deciduous trees (U.S. Forest Service 2008: 4). Typical conifers include Douglas-fir, lodgepole pine, ponderosa pine, subalpine fir, Englemann spruce, and whitebark pine. Of these, whitebark pine is found at the highest elevations; subalpine fir, Douglas-fir, and lodgepole pine on upper to mid-level slopes; and ponderosa pine in the lower elevations. Englemann spruce typically occurs on moist, cool slopes associated with seeps, especially on higher elevation north slopes and along headwater streams (U.S. Forest Service 2008: 41). Douglas-fir typically occupies the broadest range of environmental conditions and is often found in dense-mixed stands of lodgepole pine and ninebark (*Physocarpus* sp.) , as well as savanna-like stands with heartleaf arnica (*Arnica cordifolia*), bluebunch wheatgrass, and Idaho fescue (U.S. Forest Service 2008: 39). Deciduous trees are primarily quaking aspen (*Populus tremuloides*) and cottonwood (*Populus balsamifera* spp *trichocarpa*) and occur in moist areas and in riparian zones along streams or drainages. These areas are often underlain by dense understory shrub layers dominated by willows and red-osier dogwood (*Cornus sericea*).

The Panther Creek site has been previously disturbed by road construction and the development of various USFS facilities (e.g., Cobalt Work Center, pack animal corral). Vegetated areas within the site boundary include riparian zones and emergent wetlands along Panther Creek channel; managed herbaceous areas around USFS facilities; and forested slopes along the west side of Panther Creek Road. Unvegetated areas include the Panther Creek Fork channel and existing roads and parking areas. Surrounding land cover is primarily forest, with some pastureland to the northeast along the east side of the creek.

#### Vegetation Cover Types

Vegetation cover types were identified and mapped on the Panther Creek analysis area during a June 11, 2014, site visit. As shown in Table 3.4-6, seven cover types were identified in the Panther Creek site. Each of these is briefly described in the following sections and their locations are shown on Figure 3.4-3.

**Figure 3.4-3. Existing Cover Types and Permanent and Temporary Impacts at the Panther Creek Weir Facility**

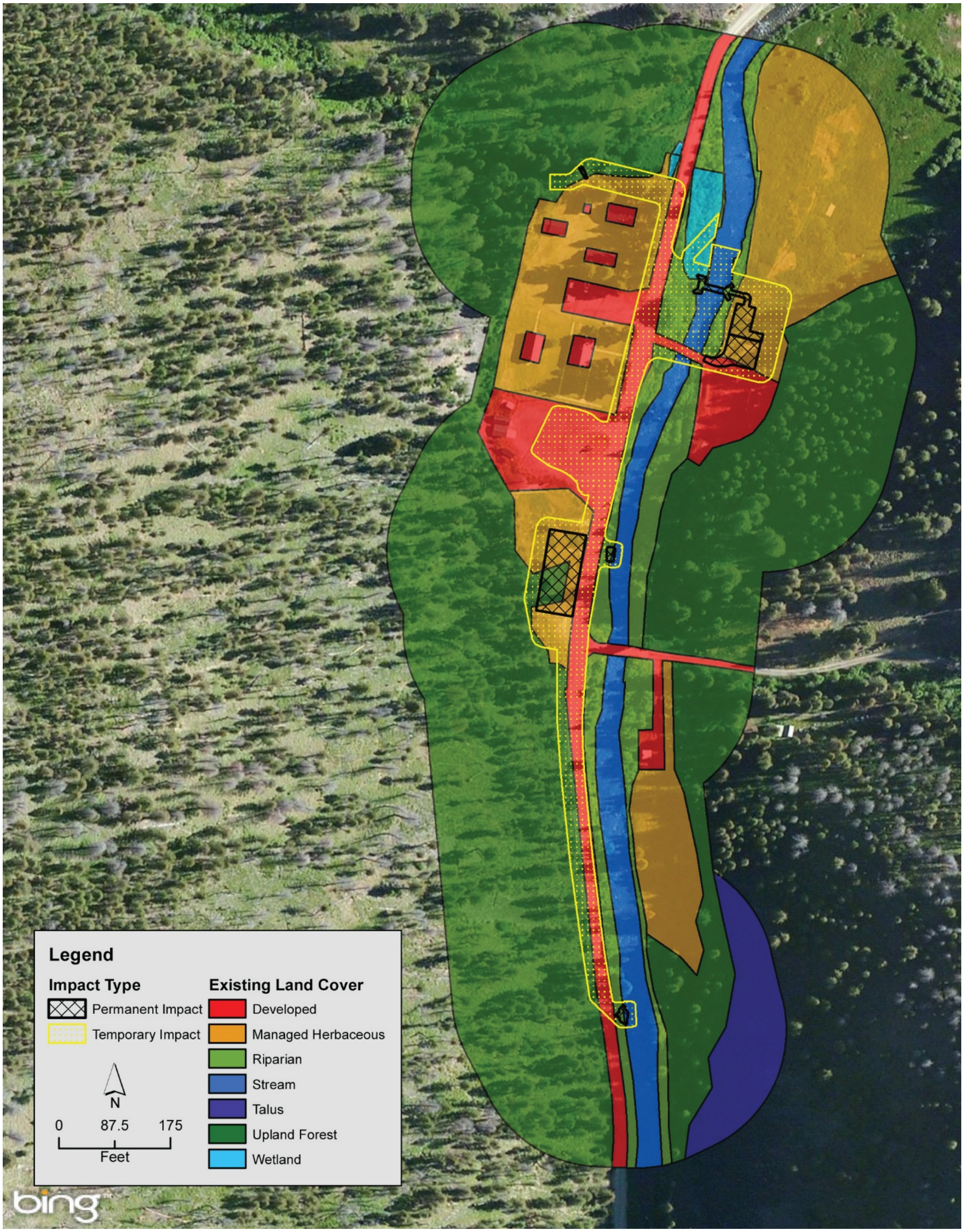


**Table 3.4-6. Vegetation Cover Types Present at the Panther Creek Site**

| Vegetation Cover Type | Area (Acres) | Percent Cover |
|---|---|---|
| Riparian | 1.68 | 7 |
| Wetland Herbaceous | 0.19 | 1 |
| Upland Forest | 12.60 | 54 |
| Managed Herbaceous | 4.40 | 19 |
| Stream | 1.47 | 6 |
| Talus | 0.75 | 3 |
| Developed | 2.43 | 10 |
| Total | 23.53 | 100 |

#### Riparian

Within the Panther Creek site, the riparian cover type occurs along both sides of Panther Creek (Figure 3.4-3). On the west bank, riparian areas exist in a 10- to 60-foot-wide strip between the creek channel and Panther Creek Road, with the narrowest portion located near the center of the site across from the visitor parking lot of the USFS administrative facility and the widest portion located at the downstream end of the site. On the east bank, riparian areas occur between the channel and an unpaved access road and pasture. Dominant vegetation in this cover type includes mountain alder and red-osier dogwood, with Idaho bentgrass in the herbaceous layer. Wood's rose (*Rosa woodsii*), salmonberry (*Rubus spectabilis*), common snowberry (*Symphoricarpos albus*), and prickly gooseberry are also common. Scattered trees including black cottonwood (*Populus balsamifera* L. ssp. *trichocarpa*), Geyer's willow, white willow (*Salix alba*), and lodgepole pine are also present. Dominant vegetation in the herbaceous layer includes smooth brome (*Bromus inermis*), Idaho bentgrass, Starry Solomon's seal, scouring rush (*Equisetum hyemale*), and Nebraska sedge (*Carex nebrascensis*). Common mullein (*Verbascum thapsus*) is also present. Overall, the riparian cover type occupies 1.68 acres (7%) of the Panther Creek analysis area.

#### Wetland Herbaceous

The wetland herbaceous cover type occurs on the northern end of the Panther Creek analysis area, in a roadside ditch along the west side of Panther Creek Road and directly adjacent to the channel on the west bank of Panther Creek (Figure 3.4-3). These areas correspond with Wetland Panther-A and Wetland Panther-B, respectively, as described in Section 3.6, *Wetlands and Floodplains*, Section 3.6.2.3, *Panther Creek Weir Facility.* Dominant vegetation includes Nebraska sedge, with Woods' rose and salmonberry shrubs present around its edges. Some tall buttercup and creeping spikerush are also present. This cover type occupies 0.19 acres (1%) of the Panther Creek analysis area.

#### Upland Forest

The upland forest cover type occurs on the slopes in the eastern and western portions of the Panther Creek analysis area (Figure 3.4-3). Dominant vegetation includes Douglas-fir, with mountain alder, snowberry, heart-leaf arnica, and various grasses in the understory. The cover type continues upslope and offsite to the west and also occurs on the slopes to the east of the site. The upland forest cover type occupies 12.60 acres (54%) of the Panther Creek analysis area.

### Managed Herbaceous

The managed herbaceous cover type occurs in and around the USFS Cobalt Work Center and includes grasslands and lawn that is regularly maintained by mowing (Figure 3.4-3). It is dominated by various types of grass include Kentucky bluegrass (*Poa pratensis*), smooth brome, Idaho fescue, and Idaho bentgrass, among others. Scattered weedy forbs including common dandelion (*Taraxacum officinale*), curly dock (*Rumex crispus*), and bull thistle (*Cirsium vulgare*) are also present. This cover type also includes various native and ornamental trees and shrubs (e.g., various pines, lilac) that are present around the USFS facility. The managed herbaceous cover type covers 4.40 acres (19%) of the Panther Creek analysis area.

### Stream

The stream cover type consists of the portion of the Panther Creek channel that occurs in the analysis area (Figure 3.4-3). This channel is unvegetated and typically carries flowing water. It occupies 1.47 acres (6%) of the Panther Creek analysis area.

### Talus

The talus cover type is located in the southeast portion of the Panther Creek analysis area, near the toe of the slope along the east side of the Panther Creek channel (Figure 3.4-3). It consists of a relatively open area occupied by an accumulation of rock and gravel and occupies 0.75 acres (3%) of the Panther Creek analysis area.

### Developed

The developed cover type includes Panther Creek Road, the two bridges that span the stream channel, and the existing gravel parking areas and sidewalks around the USFS Cobalt Work Center (Figure 3.4-3). It covers 2.43 acres (10%) of the Panther Creek analysis area.

## Special Status Species

Special status plant species that have the potential to occur in the Panther Creek analysis area are listed in Table 3.4-7 along with their federal and state status and characteristic habitat. This site-specific species list was obtained from the USFS Salmon-Cobalt Ranger District for the North Zone of the Salmon-Challis National Forest (Haggas pers. comm.). Species included on this list were cross-checked with USFWS IPaC system list for Lemhi County, Idaho (USFWS 2015d) and IDNHP's special status vascular and nonvascular tracked plants and ranks list (IDNHP 2014).

### Federally Listed Plant Species

Whitebark pine is the only ESA-listed plant species known to occur in the north zone of the Salmon-Challis National Forest (Table 3.4-7). This species was not observed on the Panther Creek site, nor is it likely to occur on the site due to the lack of alpine/subalpine habitat. IDNHP has no records of this species occurring within 8 miles of the Panther Creek site but does record two individuals over 9 miles to the southeast of the site (IDFG 2015d). Both of these individuals are located on ridgelines at elevations of above 8,000 feet mean sea level.

### USFS Region 4 Sensitive Plant Species and State Sensitive Plant Species

As shown in Table 3.4-7, eight USFS Region 4 sensitive plant species are known to occur in the North Zone of the Salmon-Challis National Forest. None of these species were found on the Panther Creek site during the June 11, 2014, field visit, nor are there any recorded occurrences of these plants within 1 mile of the site (IDFG 2015d). Based on characteristic habitat, only Lemhi penstemon (*Penstemon lemhiensis*) could potentially occur on the site. IDNHP documents several observations of this species within 2 to 10 miles of the site, nearly all of which occur along established roads. Suitable habitat for this species on the Panther Creek site could occur along the edges of Panther Creek Road and in other disturbed areas around the existing USFS facilities.

**Table 3.4-7. Special Status Plant Species—Salmon-Challis National Forest, North Zone**

| Common Name | Scientific Name | Federal Status[a] | State Status[b] | Characteristic Habitat |
|---|---|---|---|---|
| Pink agoseris | *Agoseris lackschewitzii* | R4 | S2 | Wet meadows with soil saturated through the growing season. |
| Flexible alpine collomia | *Collomia debilis* var. *camporum* | R4 | S2 | Talus slopes at high elevations. |
| Douglass' Biscuitroot | *Cymopterus douglassii* | R4 | S3 | Alpine and subalpine areas on open slopes, ridges, and summits in calcareous or dolomitic substrates. |
| Sacajawea's Bitterroot | *Lewisia sacajaweana* | R4 | S2 | Sparsely vegetated, gravelly openings in decomposed granite, commonly near late snow banks, upper slopes and ridgetops; endemic to the mountains of central Idaho between 5,400 and 9,500 feet. |
| Lemhi penstemon | *Penstemon lemhiensis* | R4 | S3 | Occurs in a variety of habitats; requires bare soil for establishment and appears to be dependent on small-scale disturbances and disturbed sites (e.g., road cuts); occurs at elevations of 3,200 to 8,100 feet. |
| Salmon twin bladderpod | *Physaria didymocarpa* var. *lyrata* | R4 | S1 | Rocky, sparsely vegetated, south slopes between 4,050 and 6,800 feet. Bare ground and rock coverage (1–3 inches rock). |
| Whitebark Pine | *Pinus albicaulis* | C | S3 | Highest elevation forest and at timberline in alpine and subalpine zones. |
| Marsh's Bluegrass | *Poa abbreviata ssp. marshii* | R4 | S1 | Alpine fell-fields. |
| Idaho Range Lichen | *Xanthoparmelia idahoensis* | R4 | S1 | Mountain rangelands of central Idaho in sagebrush. |

Source: U.S. Forest Service, Salmon-Cobalt Ranger District (Haggas pers. comm.)

[a] Federal Status under the Endangered Species Act determined by U.S. Fish and Wildlife Service (USFWS 2015d):
C = Candidate species. Sufficient information exists to support listing as Endangered or Threatened
R4 = USFS Region 4 Sensitive Species

[b] State Status of plant species as determined by Idaho National Heritage Program (IDNHP 2014):
S1 = Critically imperiled: at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, and other factors
S2 = Imperiled: at high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors
S3 = Vulnerable: at moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors

Suitable habitat for the remaining sensitive species shown in Table 3.4-7 is not present on the Panther Creek site. Flexible alpine collomia (*Collomia debilis* var. *camporum*), Douglas' biscuitroot, Sacajawea's bitterroot (*Lewisia sacajaweana*), and Marsh's bluegrass are all found in alpine and subalpine habitats, which are not present at the Panther Creek site. Neither are wet meadows, sparsely vegetated slopes, or mountain rangelands, which are the typical habitats for pink agoseris (*Agoseris lackschewitzii*), salmon twin bladderpod (*Physaria didymocarpa* var. *lyrata*), and Idaho range lichen (*Xanthoparmelia idahoensis*), respectively.

#### Management Indicator Species

USFS does not currently identify any plants as Management Indicator Species under the Salmon Land and Resource Management Plan for the Salmon portion of the Salmon-Challis National Forest. All plant Management Indicator Species in the Salmon-Challis National Forest were replaced with fish and wildlife species in a 2004 amendment to the Land and Resource Management Plans (USFS 2004).

### Noxious Weeds

In their February 2015 *Salmon-Challis National Forest Invasive Plant Treatment Draft Environmental Impact Statement*, USFS maps noxious weed infestations of spotted knapweed along much of Panther Creek Road, including the section that crosses through the Panther Creek site (USFS 2015a: Map 4). Spotted knapweed infestations are also mapped along National Forest Road 099 and in several surrounding areas. Spotted knapweed is listed on the state's Contain list. No other noxious weed infestations are mapped for the Panther Creek site.

No individuals of any state-listed noxious weeds were observed on the site during the June 11, 2014, site visit.

## 3.4.2 Environmental Consequences

Construction and operation of the proposed Hatchery Program would cause direct, indirect, and cumulative impacts on vegetation.

Potential impacts on vegetation from the Hatchery Program were also considered in regard to their duration. Permanent impacts are those that would modify vegetation cover types to such a degree that they would not return to their preconstruction state for the life of the Hatchery Program. Temporary impacts are those that would result in the short-term disturbance of vegetation but would not prevent the re-establishment of similar preconstruction conditions in the affected areas.

Construction impacts on vegetation resources were determined for each of the sites by overlaying the proposed facility footprints onto a basemap that included the vegetation cover types identified at each site. Cover types that fell within the footprint were considered to be either temporarily or permanently impacted by construction and operation depending upon the proposed activity. Impacts from proposed facility operations were identified by examining how routine operational procedures could affect vegetation located both on and off the site. Such impacts were qualitatively described, including the impact mechanism, potential effects, duration (i.e., temporary or permanent), and likelihood of occurrence in light of the proposed operations' mitigation measures.

### 3.4.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

The potential impacts of the construction and operation of the Crystal Springs hatchery on vegetation are discussed in the following sections. Because this facility would be built under all action alternatives, these impacts would be the same for both Alternative 1 and Alternative 2.

**Construction**

Clearing and grading for construction of the hatchery facilities would result in the temporary removal of 8.57 acres of vegetation, of which 3.23 acres would be a permanent removal (Figure 3.4-1). Permanently cleared areas would be replaced with buildings, rearing ponds, gravel roads and parking areas, and other hatchery infrastructure. Individual impacts on existing vegetation cover types that would result from these activities are summarized in Table 3.4-8.

**Table 3.4-8. Construction Impacts on Vegetation Cover Types—Crystal Springs Hatchery Site**

| Vegetation Cover Type | Total Area in Site (Acres) | Total Impacts (Acres) | Temporary Impacts (Acres) | Permanent Impacts (Acres) |
|---|---|---|---|---|
| Big Sagebrush | 3.25 | 2.10 | 0.65 | 1.46 |
| Disturbed Grassland | 11.02 | 5.12 | 3.38 | 1.73 |
| Bunchgrass Grassland | 0.15 | 0.01 | 0.01 | 0 |
| Weedy Forb | 2.23 | 0.80 | 0.77 | 0.03 |
| Mixed Woodland | 0.43 | 0.43 | 0.41 | 0.02 |
| Russian Olive Woodland | 0.42 | 0 | 0 | 0 |
| Agricultural | 3.02 | 0.11 | 0.11 | 0 |
| Riparian | 0.57 | 0 | 0 | 0 |
| Pond/Wetland | 1.07 | 0 | 0 | 0 |
| Stream | 0.28 | 0 | 0 | 0 |
| Gravel Bar | 0.05 | 0 | 0 | 0 |
| Developed | 1.54 | 0.27 | 0.15 | 0.12 |
| Total | 24.02 | 8.84 | 5.48 | 3.36 |

The majority of these activities would occur in big sagebrush and disturbed grassland cover types, affecting 2.10 acres and 5.12 acres of these types, respectively. Clearing and grading work in the big sagebrush cover type would remove native big sagebrush, including several large (5 to 6 feet in height) individuals, three small Russian olive trees, and the non-native cheatgrass herbaceous layer. A few areas dominated by rush skeletonweed would also be removed. Clearing and grading work in the disturbed grassland cover type would affect non-native species, primarily cheatgrass. Other cover types affected by construction include a total of 1.35 acres of agriculture, bunchgrass, mixed woodland, and weedy forb. Overall, much of the vegetation that would be affected by construction is non-native and includes state-listed noxious weeds.

Temporary construction impacts on vegetation would arise through vehicle usage, material storage and stockpiling, and ground disturbance. Areas of exposed soil resulting from these activities would be susceptible to colonization by invasive vegetation (e.g., cheatgrass) and state-listed noxious weeds (e.g., musk thistle, rush skeleton weed), which are already abundant on the proposed hatchery site and whose seeds could be spread by wind-dispersal or by construction vehicles and workers. These exposed areas could also be susceptible to erosion by stormwater runoff, which could carry sediments, spilled vehicle fluids, or other construction materials into areas outside of the proposed hatchery site, potentially affecting the health and vigor of the vegetation in those areas. Depending on the extent, duration, and content of this runoff, vegetation could be affected through interference with photosynthesis, respiration, growth, and/or reproduction. Fugitive dust from construction activities and vehicle usage could also affect vegetation by collecting on leaves and other plant surfaces, potentially inhibiting photosynthesis and other functions. As with the areas that would be permanently affected by construction activities, much of the vegetation that could be temporarily impacted by Alternatives 1 and 2 consists of non-native species and state-listed noxious weeds.

The potential for temporary construction impacts on vegetation would be minimized by adhering to permit conditions, such as those required by the National Pollutant Discharge Elimination System permit and the Bingham County building and grading permits that would be required for Alternatives 1 and 2. Compliance with these permits could include implementation of an erosion control and sedimentation plan and other relevant best management practices (BMPs) to reduce the potential for soil erosion during construction and related impacts on water quality or adjacent vegetated areas. Such permits could also require development and implementation of a Spill Prevention, Control, and Countermeasures plan and a site-specific Construction Stormwater Pollution Prevention Plan that includes BMPs for equipment and material handling and construction waste management. Implementation of the measures outlined in these plans would reduce the potential for temporary impacts on vegetation from the use of construction equipment and materials, resulting in a **low** impact. Typical BMPs that would be implemented to reduce impacts on vegetation are listed in Section 3.4.3, *Mitigation*.

#### Operations

Direct impacts on vegetation from operation of the Crystal Springs hatchery would be limited to the implementation of vegetation maintenance and weed control activities on the proposed hatchery site.

Vegetation cover would be permanently reduced under implementation of Alternatives 1 and 2, but the vegetation cover that would be lost does not provide habitat for special-status species; nor would there be any temporary disturbance of habitat for special-status species. Accordingly, the impact of the construction and operations of the Crystal Springs hatchery on vegetation would be **low**.

### Yankee Fork Weir Facility

#### Construction

Clearing and grading for construction of the permanent Yankee Fork weir facility would result in the permanent removal of 0.86 acres and the temporary removal of 1.44 acres of vegetation (Figure 3.4-2). Permanently cleared areas would be replaced with asphalt and gravel road, gravel parking areas, and other facility infrastructure (e.g., bridge-supported weir, adult holding and spawning facility). Individual impacts on existing vegetation cover types that would result from these activities are summarized in Table 3.4-9.

**Table 3.4-9. Construction Impacts on Vegetation Cover Types—Yankee Fork Weir Facility**

| Vegetation Cover Type | Total Area in Site (Acres) | Total Impacts (Acres) | Temporary Impacts (Acres) | Permanent Impacts (Acres) |
|---|---|---|---|---|
| Riparian | 1.31 | 0.33 | 0.33 | 0.01 |
| Wetland Scrub-Shrub | 0.19 | 0.02 | 0.02 | 0 |
| Upland Shrub | 2.66 | 0.92 | 0.31 | 0.62 |
| Upland Forest | 6.27 | 0.30 | 0.08 | 0.21 |
| Dead Fall | 1.04 | 0 | 0 | 0 |
| Stream | 2.30 | 0.53 | 0.51 | 0.02 |
| Gravel Bar | 0.82 | 0.16 | 0.16 | 0 |
| Dredge Tailings | 3.53 | 0.04 | 0.04 | 0 |
| Talus | 0.90 | 0 | 0 | 0 |
| Developed | 2.80 | 1.05 | 0.45 | 0.60 |
| **Total** | **21.82** | **3.35** | **1.89** | **1.46** |

The majority of these activities would occur in the upland shrub cover type, affecting approximately 0.92 acre of this type. Clearing and grading work in this cover type would remove mostly native species including mountain alder and willows. Approximately 11 native trees, mostly lodgepole pine, and several small quaking aspen saplings would also be removed. Construction of the temporary bypass channel and bridge-supported weir would require the removal of approximately 0.33 acre of riparian vegetation including mountain alder and willows. Of this, 0.01 acre would be a permanent removal associated with permanent structures; the temporary vegetation removal, which affects the inlet and outlet of the temporary bypass channel, would be replanted at the close of construction.

Construction activities could temporarily affect vegetation adjacent to the construction area through the same mechanisms discussed in Section 3.4.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, for the Crystal Springs hatchery site. The potential for construction activities to spread noxious weeds is likely to be less than on the hatchery site due to the limited number of state-listed noxious weed species in the area; USFS reports the presence only of spotted knapweed (although none were detected during the site survey in June 2014). Temporary construction impacts would be minimized by adhering to any required permit conditions and by implementing the BMPs listed in Section 3.4.3, *Mitigation*, including all applicable *General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs* (USFS 2001). These practices would result in **low** impacts on the vegetation resource.

### Operations

Direct impacts on vegetation from operation of the Yankee Fork weir facility would include an increased potential to spread invasive species and noxious weeds in the Salmon-Challis National Forest, and the enhanced control of such species on the Yankee Fork site by the development and implementation of vegetation maintenance and weed control activities. Vehicles and workers moving into and out of the area during weir operation and trapping activities could transport weed seeds from other parts of the state into the Salmon-Challis National Forest where they could spread and displace native vegetation.

As a facility that would operate on public land in the Salmon-Challis National Forest, the Yankee Fork weir facility would be subject to the vegetation management requirements and policies of

USFS. Under these requirements, a vegetation and weed management plan would be developed. This plan would augment the invasive plant control practices that are already used by USFS and could result in a decrease in the extent of invasive species and noxious weeds on the proposed weir site and the immediate vicinity. Because construction of the Yankee Fork weir facility would result in little permanent vegetation loss, and no loss of vegetation providing habitat for special-status species, and because of operational compliance with the vegetation management plan, there would be **low** impacts on the vegetation resource.

## Panther Creek Weir Facility

### Construction

Clearing and grading for construction of the Panther Creek weir facility would result in the permanent removal of approximately 0.29 acres of vegetation, and the temporary removal of an additional 1.27 acres of vegetation. These impacts would affect managed herbaceous, upland forest, riparian, and wetland herbaceous areas, as well as the unvegetated stream and developed cover types (Figure 3.4-3). Cleared areas would be replaced with gravel access road and parking areas, and other temporary and permanent facility infrastructure (e.g., acclimation ponds, bridge-supported weir, adult holding and spawning facility). Areas of temporary impact are those that would be remediated by revegetation. Individual impacts on existing vegetation cover types that would result from these activities are summarized in Table 3.4-10.

**Table 3.4-10. Construction Impacts on Vegetation Cover Types –Panther Creek Weir Facility**

| Vegetation Cover Type | Total Area in Site (Acres) | Total Impacts (Acres) | Temporary Impacts (Acres) | Permanent Impacts (Acres) |
|---|---|---|---|---|
| Riparian | 1.68 | 0.26 | 0.24 | 0.02 |
| Wetland Herbaceous | 0.19 | 0.05 | 0.05 | 0 |
| Upland Forest | 12.60 | 0.37 | 0.31 | 0.05 |
| Managed Herbaceous | 4.40 | 0.71 | 0.50 | 0.21 |
| Stream | 1.47 | 0.17 | 0.16 | 0.01 |
| Talus | 0.75 | 0 | 0 | 0 |
| Developed | 2.43 | 1.06 | 1.04 | 0.02 |
| Total | 23.53 | 2.62 | 2.31 | 0.31 |

Clearing and grading work in upland forest and riparian areas would remove mostly native species including mountain alder and willows. Approximately 11 native trees, mostly lodgepole pine, and several small quaking aspen saplings would also be removed.

Construction activities could temporarily affect vegetation adjacent to the construction area through the same mechanisms discussed under *Construction* in Section 3.4.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, for the Crystal Springs hatchery. The potential for construction activities to spread noxious weeds is likely to be less than on the hatchery site because there are no state-listed noxious weed species in the area; however, USFS has mapped noxious weed infestations of spotted knapweed along much of Panther Creek Road, including the section that crosses through the Panther Creek site. Temporary construction impacts would be minimized by adhering to any required permits and by implementing the BMPs listed in Section 3.4.3, *Mitigation*, including all applicable *General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs* (USFS 2001). In consideration of the limited area of impact, and the use of precautions to minimize weeds and remediate temporarily disturbed areas, there would be **low** impacts on the vegetation resource.

#### Operations

Direct impacts on vegetation from operation of the Panther Creek weir facility would include an increased potential to spread invasive species and noxious weeds in the Salmon-Challis National Forest, and the enhanced control of such species at the facility by the development and implementation of vegetation maintenance and weed control activities on the proposed weir site. Vehicles and workers moving into and out of the area during weir operation and trapping activities could transport weed seeds from other parts of the state into the Salmon-Challis National Forest where they could spread and displace native vegetation.

As a facility that would operate on public land in the Salmon-Challis National Forest, the Panther Creek weir facility would be subject to the vegetation management requirements and policies of USFS. Under these requirements, a vegetation and weed management plan would be developed. This plan would augment the invasive plant control practices that are already used by USFS and could result in a decrease in the extent of invasive species and noxious weeds on the proposed weir site and the immediate vicinity. Because construction of the Panther Creek weir facility would result in little permanent vegetation loss, and no loss of vegetation providing habitat for special-status species, and because of operational compliance with the vegetation management plan, there would be **low** impacts on the vegetation resource.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, Alternatives, Including the Proposed Action, for a detailed explanation of the 50% production of Chinook salmon option.) Because the footprint of the hatchery would not change, impacts on vegetation associated with construction of the hatchery facilities under the reduced production option would be the same as with full production under Alternative 1. Similar to full production, impacts on vegetation would be **low** because only low-value vegetation types would be affected by construction of the hatchery, and the vegetation cover that would be lost does not provide habitat for special-status species. In addition, impacts on vegetation would be minimized by implementing project design measures and by replanting and restoring vegetation in temporarily disturbed areas.

Although production of Chinook salmon would be reduced by 50%, operational impacts on vegetation would be the same as that described for full production under Alternative 1. Similar to full production, hatchery operations would include monitoring and controlling noxious weeds at the hatchery site in areas that had been disturbed during construction, resulting in **low** impacts on vegetation.

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, impacts on vegetation associated with construction of the weir facilities under the reduced production option would be the same as full production for Alternative 1. Similar to full production, impacts on vegetation would be **low** because construction of the weir facilities would result in minimal permanent loss of vegetation cover, and the vegetation cover lost provides only low-value vegetation types. In addition, impacts on vegetation would be minimized by implementing project design measures and by replanting and restoring vegetation in temporarily disturbed areas.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, operating the weir facilities would result in little permanent vegetation loss; however, there would still be a risk of invasive plant colonization on ground that had been disturbed during construction. To prevent invasive plant species from spreading, USFS-required general weed prevention practices would be implemented, resulting in **low** impacts on vegetation resources at the Yankee Fork and Panther Creek sites.

### 3.4.2.2 Alternative 2: Hatchery Program with Temporary Weirs

#### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts on vegetation at the Crystal Springs hatchery would be the same as described under Alternative 1.

#### Yankee Fork Weir Facility

##### Construction

Under Alternative 2, no construction would occur at the Yankee Fork site, and no permanent or temporary impacts on vegetation would occur.

##### Operation

Operation of the Yankee Fork weir facility under Alternative 2 would include the annual installation and removal of the temporary picket weir and fish trap in the stream channel. These activities would involve the placement of metal components in the channel for approximately 3 to 4 months during the summer and early fall. During installation and operation of the temporary weir, woody vegetation in the riparian zone could be cut back to provide access to the stream channel. In addition, herbaceous vegetation in the riparian zone could also be trampled by workers moving in and out of the stream channel. Overall, these impacts would be temporary and most vegetation would recover within 1 to 2 years following the completion of activities.

There is also a risk that vehicles and workers could introduce weed seeds into the analysis area. Impacts associated with this risk would be minimized by implementing the mitigation measures included in Section 3.4.3, *Mitigation*. Compliance with these mitigation measures would result in **low** impacts on the vegetation resource.

#### Panther Creek Weir Facility

##### Construction

Under Alternative 2, no construction would occur at the Panther Creek site, and no permanent or temporary impacts on vegetation would occur.

#### Operation

Operation of the Panther Creek weir facility under Alternative 2 would include the annual installation and removal of the temporary picket weir and fish trap in the stream channel. These activities would involve the placement of metal components in the channel for approximately 3 to 4 months during the summer and early fall. During installation and operation of the temporary weir, woody vegetation in the riparian zone could be cut back to provide access to the stream channel. In addition, herbaceous vegetation in the riparian zone could also be trampled by workers moving in and out of the stream channel. Overall, these impacts would be temporary and most vegetation would recover within 1 to 2 years following the completion of activities.

There is also a risk that vehicles and workers could introduce weed seeds into the analysis area. Impacts associated with this risk would be minimized by implementing the mitigation measures included in Section 3.4.3, *Mitigation*. Compliance with these mitigation measures would result in **low** impacts on the vegetation resource.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand. Due to the absence of clearing and grading activities, there would be **low** construction-related impacts on vegetation.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, operating the weir facilities would result in no permanent vegetation loss. To prevent invasive plant species from spreading, USFS-required general weed prevention practices would be implemented, resulting in **low** impacts on vegetation resources at the Yankee Fork and Panther Creek sites.

## 3.4.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on vegetation during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.4.3.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Construction

Implement the following mitigation measures to reduce construction-related impacts on vegetation at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:

- Explain vegetation-related mitigation measures to construction contractors and inspectors during a preconstruction meeting covering environmental requirements.
- Restrict construction activities to the area needed to work effectively to limit disturbance of native vegetation communities to the minimum amount necessary.
- Prior to construction, control noxious weeds either manually, mechanically, or chemically as recommended for each species, focusing on species with small, localized infestations to reduce the potential for widespread establishment and the need for long-term management.
- Use vehicle and equipment cleaning stations to minimize the spread of weeds to uninfected areas during construction by cleaning vehicles and equipment prior to entering and as soon as possible after leaving each work area.
- Use weed-free mulch and straw where such materials are needed for erosion control.
- Use local sources of rock for road construction and obtain road fill materials from noxious weed-free quarries.
- Reseed disturbed areas after construction is complete, at the appropriate time period for germination, with a native seed mix recommended by BPA or the Idaho State Department of Agriculture.
- Monitor vegetation cover of seeded areas with at least three field visits per year until site stabilization (defined as at least 70% cover by plant species other than Idaho State Department of Agriculture-listed noxious weeds) is achieved; if vegetative cover is inadequate, implement contingency measures and reseed to ensure adequate revegetation of disturbed soils.
- Approximately 1 year after construction, conduct a noxious weed survey of all areas disturbed by construction activities to determine if there are new noxious weed infestations. Implement appropriate control measures of noxious weed infestations.
- Implement applicable *General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs* included in the *USDA–Forest Service Guide to Noxious Weed Prevention Practices* (USFS 2001) into the construction and operation plans.

#### Operations

##### Crystal Springs Hatchery Site

No mitigation would be recommended during operation of the Crystal Springs hatchery.

##### Yankee Fork and Panther Creek Weir Facilities

Implement all applicable General Weed Prevention Practices for Site-disturbing Projects and Maintenance Programs included in the USDA–Forest Service Guide to Noxious Weed Prevention Practices (USFS 2001) into the construction and operation plans, as follows:

- **Practice 1.** Perform environmental analysis for projects and maintenance programs to assess weed risks, analyze potential treatment—including herbicides, if needed—of high-risk sites for weed establishment and spread, and identify prevention practices. Determine prevention and maintenance needs at the onset of project planning.

- **Practice 2.** Inventory and prioritize weed infestations for treatment in project operating areas and along access routes before ground-disturbing activities begin. Identify what weeds are on site, or within reasonably expected potential invasion vicinity, and conduct a risk assessment accordingly. Control weeds as necessary.
- **Practice 3.** Begin project operations in un-infested areas before operating in weed-infested areas.
- **Practice 4.** Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules is least likely.
- **Practice 7.** Inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment. Proper disposal consists of bagging the seeds and plant parts and incinerating them.

### 3.4.3.2 Alternative 2: Hatchery Program with Temporary Weirs

#### Construction

##### Crystal Springs Hatchery

Implement the same mitigation recommended under Alternative 1 for construction of Crystal Springs hatchery.

##### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation would be recommended.

#### Operations

##### Crystal Springs Hatchery Site

No mitigation would be recommended during operation of the Crystal Springs hatchery.

##### Yankee Fork and Panther Creek Weir Facilities

Implement the same mitigation recommended under Alternative 1 for the Yankee Fork and Panther Creek weir facilities.

## 3.4.4 No Action Alternative

Under the No Action Alternative, the Crystal Springs hatchery, Yankee Fork and Panther Creek weir facilities would not be constructed. Existing conditions would continue, and no vegetation removal or clearing would occur on the site. Because no vegetation removal or clearing would occur on the site, **no** vegetation impacts would result from the No Action Alternative.

# 3.5 Groundwater and Surface Water Quality and Quantity

This section describes the affected environment and environmental consequences, including mitigation measures, associated with groundwater and surface water quality and quantity, resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level (1 million smolts) and a 50% production level. This section also summarizes the federal Wild and Scenic Rivers Analysis presented in Appendix D for the "free flowing" character of Yankee Fork and Panther Creek, which is considered in the affected environment and the environmental consequences analysis for both Yankee Fork and Panther Creek.

The analysis area for water quality at the proposed Crystal Springs hatchery site consists of groundwater resources hydraulically contiguous to the proposed hatchery site, and surface waters including McTucker Creek and American Falls Reservoir. For the Yankee Fork and Panther Creek weir facilities, the analysis area includes the rivers at and downstream of the Yankee Fork weir facilities to its confluence with the Salmon River, and Panther Creek weir facilities downstream to its confluence with Blackbird Creek.

The area of analysis for water quantity consists of:

- Groundwater resources hydraulically contiguous to the proposed Crystal Springs hatchery site.
- Surface waters including the existing ponds adjacent to the proposed hatchery (on the abandoned hatchery site), McTucker Creek, American Falls Reservoir, the rivers at and downstream of the water intakes at the Yankee Fork and Panther Creek weir facilities, and Dummy Creek, a tributary to Panther Creek (See Figures 2-1, 2-4, and 2-7 for locations of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility, respectively).

Surface and groundwater rights are evaluated and administered by the Idaho Department of Water Resources on private and federally administered lands, assuming there are no overlapping federal water rights in the river reaches affected by the diversions. The Salmon and Challis National Forest plans did not indicate any federal water rights in the sections of Yankee Fork and Panther Creek affected by the diversions. For the Crystal Springs hatchery site, the Bonneville Power Administration (BPA) (current owner of the property) holds two water rights on the property totaling 24 cubic feet per second (cfs) for fish propagation and domestic use. If the Hatchery Program is approved and funded, the property and water rights would be conveyed to the Shoshone-Bannock Tribes (Tribes) for use under the Hatchery Program. A separate water right would need to be obtained to supply domestic water to proposed hatchery staff residences on the western parcel of the site.

# 3.5.1 Affected Environment

## 3.5.1.1 Crystal Springs Hatchery Site

### Water Quality

The proposed Crystal Springs hatchery would be located in Bingham County, 2.9 miles southeast of the town of Springfield. The site is adjacent to and drains toward McTucker Creek (Figure 2-1). Topography of the property slopes gradually from higher ground on the north and west property boundary to a series of ponds along the south and east boundaries. The ponds, which collect flow from artesian wells and potentially from subsurface flow, are connected by short channels extending from north to south. An existing 36-inch culvert conveys water from the ponds beneath River Road, where it flows into McTucker Creek, and a tributary to American Falls Reservoir in the Snake River basin.

Under the Clean Water Act, the Idaho Department of Environmental Quality (IDEQ) is required to regularly assess water quality and report to the U.S. Environmental Protection Agency (EPA) on the condition of the State's waters. As required in Clean Water Act Section 303(d), IDEQ identifies those waters which do not meet water quality standards for beneficial uses.[1] Where data is available, IDEQ also identifies specific water quality limitations and impairments for the State's waters. The summary report is commonly referred to as the 303(d) list and is used to identify where improvements to water quality are needed to meet state and national standards. States and tribes are also required to develop total maximum daily loads (TMDLs) for identified pollutants to achieve water quality standards under the Clean Water Act.

Several waterbodies within the American Falls subbasin are listed under the Clean Water Act Section 303(d) as impaired, meaning that they do not currently meet water quality standards (IDEQ et al. 2012). Within the analysis area for the proposed Crystal Springs hatchery, both McTucker Creek (sediment) and American Falls Reservoir (sediment and total phosphorus) have been listed as water quality limited water bodies that do not support the beneficial uses designated for those waterbodies.

For American Falls Reservoir, designated beneficial uses include:

- Cold water aquatic life
- Salmonid spawning
- Contact recreation (primary) and noncontact recreation (secondary)[2]
- Domestic & agricultural water supply
- Aesthetics
- Wildlife habitat

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[1] Beneficial uses include domestic and industrial water supply; irrigation and livestock watering; fishing, boating, and water contact recreation; fish and aquatic life, wildlife, and hunting; aesthetic qualities; and hydropower, commercial navigation, and transportation.

[2] Contact recreation, or primary contact recreation, is defined as recreational activities involving a significant risk of ingestion of water, including wading by children, swimming, water skiing, diving, and surfing. Noncontact recreation, or secondary contact recreation, is defined as aquatic recreational pursuits not involving a significant risk of water ingestion, including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity.

The American Falls Reservoir subbasin covers 2,869 square miles (1.8 million acres) and the reservoir is used primarily for irrigation and electricity generation. Pollutants listed under the 303(d) listing for American Falls Reservoir include dissolved oxygen, nutrients, chlorophyll *a*, and sediment (IDEQ et al. 2012). Of these, IDEQ has identified TMDL allocations for nutrients (total phosphorus) and sediment (as phosphorus), which is thought to be the principal pollutant responsible for the elevated chlorophyll *a* and lowered dissolved oxygen. Primary tributaries to the American Falls Reservoir and listed pollutants in the TMDL include:

- Bannock Creek (unknown cause—suspected nutrients, sediment, fecal coliform and bacteria)
- McTucker Creek (sediment)
- Moonshine Creek (sediment)
- Rattlesnake Creek (sediment)
- Knox Creek (sediment, combined biota/habitat bioassessment)
- Danielson Creek (combined biota/habitat bioassessment)
- Little Hole Draw (combined biota/habitat bioassessment)

McTucker Creek, listed for sediment, is not supporting its beneficial uses for cold-water aquatic life and salmonid spawning. The potential sources of sediment identified by the TMDL are associated with historical activities, livestock grazing, and impacts on the instream channel and streambanks, all of which are non-point sources of pollutants. There are currently no point sources of pollutants to McTucker Creek. The TMDL has allocations for sediment of 1,439 tons per year, and a recommended total phosphorus load allocation of 6.5 tons per year (IDEQ et al. 2012).

## Water Quantity

### Groundwater

Groundwater in the hatchery analysis area occurs both as shallow groundwater and groundwater within the deeper confined East Snake Plain Aquifer (ESPA). Regionally, groundwater flows toward the west-southwest. In the analysis area, groundwater flows toward American Falls Reservoir, a hydraulic low point. Within the hatchery analysis area, the static level of surficial 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). 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 (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 the U.S. Environmental Protection Agency 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 (IDEQ 2009). Regional trends with respect to water level in the ESPA indicate a long-term decline, which prompted the State of Idaho to prepare a comprehensive management plan to improve and stabilize the water supply from the ESPA (IDEQ 2009). As part of the evaluation of the proposed hatchery, SPF Water Engineering (2010) conservatively estimated that the aquifer water levels could drop 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 existing wells at the abandoned hatchery adjacent to the proposed Crystal Springs hatchery site tap surficial groundwater in addition to the ESPA, which has a water-bearing stratum of sand and gravel approximately 45 feet thick (Clearwater Geosciences 2008). The depth and drilling dates for the six existing artesian wells are only known for Well #5 (180 feet, drilled in 1998) and Well #6 (193 feet, drilled in 1997). The total flow from the six existing wells was estimated to be 11 cfs in 2010 (SPF Water Engineering 2010). The average temperature of the two wells with available data (Wells #5 and #6) was 51 degrees Fahrenheit (°F).

#### Surface Waters

##### *McTucker Creek*

McTucker Creek is a small (2.24 miles long) creek that adjoins the proposed hatchery site and flows to American Falls Reservoir. There is no published information on stream flow in the vicinity of the hatchery site. McTucker Creek is fed in part from the spring ponds adjacent to the proposed hatchery site. Based on discharge measurements, most of the source water to those ponds is provided through a 4-inch casing in the top pond and existing Well #3. These combined sources contribute approximately 6 to 7 cfs to the top pond, which flows through the four lower ponds. Wells #4 and #5 also flow to the lower ponds, and based on measurements collected on May 1, 2015, they are currently contributing approximately 4 cfs. Although the contribution of the water flowing through the ponds to McTucker Creek varies, measurements of discharge from the lower pond to McTucker Creek on May 1, 2015, was approximately 11 cfs, which is consistent with earlier estimates (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 feet (IDEQ 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 from natural flows: 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 yearly weather conditions 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 (IDEQ 2009).

## 3.5.1.2 Yankee Fork Weir Facility

### Water Quality

The Yankee Fork of the Salmon River, located in Custer County, is one of the main tributaries to the Salmon River, with a watershed covering about 122,000 acres. The Yankee Fork flows approximately 28 miles to its confluence with the Salmon River near Sunbeam, Idaho. The proposed facility on the Yankee Fork lies approximately 3 miles above the confluence with the Salmon River.

Upstream of the proposed facility, the Yankee Fork has experienced extensive habitat alteration due to historical dredging for gold and other metals (dredge operations ceased in 1952).

All waters of the State of Idaho are designated for beneficial uses that include agricultural and industrial water uses, wildlife, and aesthetics. The Yankee Fork is further designated for domestic water supply, cold-water biota, salmonid spawning, primary contact recreation, and special resource water. The Upper Salmon River Subbasin Assessment and TMDL (IDEQ 2003) indicated water quality impairment in waters from Jordan Creek to the Salmon River for sediment and habitat alteration. Sections of the Yankee Fork within the Salmon-Challis National Forest were listed for sediment. However, a TMDL for sediment was determined to not be warranted by IDEQ (IDEQ 2003).

Historical and present mining activities have formerly resulted in water quality impacts from selenium, mercury, cyanide, and other pollutants associated with mining in the drainage. However, there are presently no chemical contaminants which exceed IDEQ water quality standards in the basin (Reclamation 2012d).

## Water Quantity

The Yankee Fork is one of the major tributaries of the Salmon River. It has a drainage area of 122,000 acres and flows 28 miles from its headwaters to its confluence with the Salmon River near Sunbeam, Idaho (Reclamation 2012d). The proposed facilities are located at approximately river mile 3 on the Yankee Fork.

A U.S. Geological Survey (USGS) gauge (operated by the Tribes) was installed in the Yankee Fork about 1 mile above its confluence with the Salmon River in fall 2011. The monthly mean discharge for the three-year period (2012–2014) at this station ranged from 47 cfs in January to 934 cfs in May (USGS 2015b). The flow rate measured at this gauge is representative of the flow rate at the proposed facilities on Yankee Fork. Table 3.5-1 provides flow and percent of flow diverted during periods when the facility is used for adult holding. Peak flows in the Yankee Fork are predominately driven by snowmelt.

**Table 3.5-1. Mean Monthly Discharge Diverted for Adult Holding of Chinook Salmon at Yankee Fork and Adult Holding and Smolt Acclimation at Panther Creek Weir Facilities (2012–2014)**

| | Month | | | | | | |
|---|---|---|---|---|---|---|---|
| | April | May | June | July | August | September | October |
| Yankee Fork | | | | | | | |
| Mean Monthly Discharge (cfs) | | 934 | 596 | 196 | 88 | 73 | 90 |
| Percent Diversion | | 1.1% | 1.7% | 5.1% | 11.4% | 13.7% | 11.7% |
| Panther Creek | | | | | | | |
| Mean Monthly Discharge (cfs) | 131 | 381 | 197 | 75 | 45 | 37 | 34 |
| Percent Diversion | 2.3% | 0.8% | 6.6% | 13.3% | 22.2% | 27.0% | 29.4% |

Note: Collection of Chinook salmon typically concludes at the end of August, or when adults are not found in the weirs for seven consecutive days. Diversions would continue at the facilities, as held adults are ready for spawning.
cfs = cubic feet per second

## Wild and Scenic Rivers

Under the National Wild and Scenic Rivers System, Yankee Fork is considered as eligible under the "Recreation" classification for Wild and Scenic Rivers (USFS 1989). Section 2(b) of the Wild and Scenic Rivers Act (P.L. 90-542) requires that all rivers considered eligible for designation need to be "free-flowing." Section 15 (b) of the Act defines a "free-flowing" river as one which is in a "natural condition" and without impoundment, diversion, rip-rapping, or other modifications of the waterway. It also states that existence of low dams, diversion works, and other minor structures shall not automatically bar its consideration, though such construction is discouraged.

In the Challis National Forest's 1989 Wild and Scenic Rivers Evaluation Report (USFS 1989), Segment A of the Yankee Fork was evaluated to be free-flowing in a natural condition for its entire length and that it contained one bridge. Segment B, however, was in question as to whether it met the intent of "free flowing in a natural condition" because of past dredging activities that re-routed the river and changed its width, depth, banks, and slope from its natural condition. The presence of this compromising condition did not prevent the Challis National Forest from finding both segments of the Yankee Fork eligible for Wild and Scenic River status in the "Recreation" classification. The "Recreation" classification allows for rivers that have undergone some impoundment or diversion in the past (16 USC §1273 (b) (3)).

# 3.5.1.3 Panther Creek Weir Facility

## Water Quality

Panther Creek, located in Lemhi County, is a tributary to the Salmon River and covers about 1,810 square miles, flowing approximately 25 miles from the Panther Creek weir facility to the confluence with the Salmon River.

The Panther Creek drainage has experienced water quality issues associated with present and historical mining operations, particularly in the Blackbird Creek drainage, downstream of the proposed weir. Panther Creek is on the 303(d) list for copper from Blackbird Creek to Big Deer Creek, which lies downstream of the proposed weir site. Water quality above Blackbird Creek, which enters Panther Creek 0.9 mile below the facility, is considered good (i.e., no identified pollutants of concern).

## Water Quantity

Panther Creek is a tributary to the upper Salmon River with a drainage area of approximately 1,810 square miles (1,158,400 acres) and approximately 400 miles of perennial streams (IDEQ 2015a). The proposed facilities are located at approximately river mile 3.1 on Panther Creek, across the creek from the U.S. Forest Service's (USFS) Cobalt Work Center.

A USGS gauge was installed in Panther Creek at Cobalt, Idaho, in fall 2011. The monthly mean discharge for the three-year period (2012–2014) ranged from an average of 26 cfs in January to 381 cfs in May (USGS 2015c). The flow rate measured at this gauge is representative of the flow rate at the proposed facilities on Panther Creek. Table 3.5-1 provides flow and percent of flow diverted during periods when the facility is used for adult holding and acclimation. Peak flows in Panther Creek are predominately driven by snowmelt.

Dummy Creek is a small (watershed area of 840 acres) perennial tributary of Panther Creek, located just to the west of the proposed Panther Creek weir facilities and USFS Cobalt Work Center. Flows in Dummy Creek have not been directly measured, but are estimated to be less than 1 cfs during the summer.

## Wild and Scenic Rivers

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In the Salmon National Forest's 1993 Wild and Scenic Rivers Evaluation, Panther Creek was evaluated to be free-flowing in a natural condition for its entire length. That same free-flowing condition remains today as it was in 1993. Though there are numerous bridges that cross the river, there are no impoundments or major de-watering diversions that significantly alter the river's flow.

Panther Creek Road, located in the valley bottom, runs almost the entire length of Panther Creek from its mouth to a few miles below the Morgan Creek Summit. In some locations, it encroaches on the stream or floodplain, and in others, the road encroaches on the stream. This encroachment has resulted in reduced capacity for floodflows and a reduction in riparian vegetation and stream cover (USFS 2008). This condition, however, was present in 1993 and deemed by the agency at that time to not compromise the free-flowing character of this river sufficient to disqualify it from consideration.

## 3.5.2 Environmental Consequences

Potential sources of impacts on water quality are associated with the discharges to McTucker Creek and American Falls Reservoir at the Crystal Springs hatchery, and the discharges from the Yankee Fork and Panther Creek weir facilities. Potential impacts on water quality for the Crystal Springs hatchery are primarily associated with runoff during facility construction, and with nutrients, suspended sediment, and fish health chemicals in discharge water from hatchery operations. Under Alternatives 1 and 2, potential impacts on water quality at Yankee Fork are primarily associated with runoff during facility construction, and therapeutic chemicals (such as formalin) in short-term operational discharges from the facilities. For Panther Creek, the type of potential impacts on water quality are primarily associated with runoff during facility construction, nutrient and suspended sediments when juvenile salmon are acclimated before release, and therapeutic chemicals (such as formalin) in short-term operational discharges from the facilities.

Potential impacts on water quantity would result from the use of water by the proposed facilities. For the Crystal Springs hatchery, the source of water used by the facility would be groundwater from two of the existing artesian wells tapping the local surficial groundwater and three deeper proposed pumped wells, which would tap the ESPA. The water from the proposed hatchery would be discharged to McTucker Creek.

Under the permanent weir alternative (Alternative 1) approximately 10 cfs of water would be diverted from the Yankee Fork or Panther Creek during operation of the weirs and adult holding facilities from approximately June through mid-October for Chinook salmon operations under the Hatchery Program each year. No water would need to be diverted from either of the weir facilities under the temporary weir alternative (Alternative 2). The weirs would be operational until the end of August, or until there are seven consecutive days without Chinook salmon entering the facility. The diversion of Yankee Fork for the facility may continue until approximately mid-October as the last of the adults are held until ready for spawning. The Yankee Fork weir facility would not require diversion of water for acclimation of Chinook salmon smolts as they would be reared in an existing dredged pond just upstream of the facility.

Approximately 10 cfs of water would be diverted from Panther Creek during operation of the weir and adult holding facilities from approximately June through mid-October. As with Yankee Fork, the Panther Creek weir would be operational until the end of August, or until there are seven consecutive days without Chinook salmon entering the facility. The diversion of Panther Creek for the facility may continue until approximately mid-October as the last of the adults are held until ready for spawning. There would be 3 cfs diverted from Panther Creek to the acclimation ponds during the period that Chinook salmon smolts are acclimated on site (April through June of each year).

During adult holding, up to 1 cfs of colder water from Dummy Creek (if available) would be diverted to the adult holding ponds at times when water temperatures in Panther Creek exceed 62 °F. This would minimize the potential for disease (which can increase with increased temperatures), and minimize the need to treat the holding ponds with formalin. Based on the thermal regime of the river, water temperatures above 62 °F may occur from the last week of July through the end of August (Stone pers. comm. 2015d).

For each proposed facility, 100% of the diverted water would flow through the facilities, re-entering surface waters at the downstream end of the respective facilities.

### 3.5.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

##### Water Quality

Construction of the Alternative 1 would require grading and trenching for placement of the water supply pipelines between the wells and the proposed hatchery. The proposed new hatchery infrastructure would be sited on two adjacent parcels of land and would encompass about 6.25 acres of the 9-acre eastern parcel. About 3.75 acres of the 10.7-acre western parcel would be used for the hatchery staff residences. The remainder of each parcel would remain undisturbed.

Ground-disturbing activities associated with hatchery construction would expose bare soils and could lead to the potential for erosion and delivery of sediment to nearby surface waters. Construction work within surface waters (e.g., the outfall to McTucker Creek) 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. A stormwater National Pollutant Discharge Elimination System (NPDES) permit for construction activities would be obtained prior to ground-disturbing activities.

Several factors would minimize the potential for water quality impacts during construction: the proposed hatchery site is relatively flat, most construction would occur during the dry season, and sediment control best management practices (BMPs) would be implemented, consistent with NPDES permit requirements, to minimize the potential for runoff to enter surface waters (see Section 3.5.3, *Mitigation*). A sediment and erosion control plan and a spill prevention, control, and countermeasures (SPCC) plan would be required by IDEQ and implemented during construction; silt fencing would be installed along the perimeter of the construction site; stockpiled excavated materials would be protected from water or wind erosion by covering where appropriate; and any surface water (rain) would be detained on site and filtered before discharge. The outfall structure to McTucker Creek would be installed during the dry season, and a turbidity curtain would be used to minimize the potential for sediment introductions to surface waters. All equipment cleaning and refueling activities would occur away from surface waters (at least 300 feet) to minimize potential for wash water and fuels from entering the McTucker Creek. Because of these precautions, the potential for temporary impacts on surface water quality from construction of the hatchery would be **low**.

Under the full-production option, hatchery operations could potentially affect surface water quality in a variety of ways. Discharge of hatchery effluent could potentially affect surface water quality below the discharge via changes in:

- sediment and turbidity levels
- nutrient concentrations
- transference of fish disease and parasites
- dissolved oxygen
- water temperature
- discharge of therapeutic chemicals

The proposed Hatchery Program would be operated following several accepted and enforceable programs and regulations which minimize the potential for these types of impacts to occur, including the IDEQ water quality standards, TMDLs developed by IDEQ and approved by the EPA, and various fish health regulations and guidelines.

Operation of the proposed hatchery could affect downstream waters with increased turbidity and sedimentation because the increased groundwater discharge could release sand (which may be entrained in the water pumped from the wells) to McTucker Creek and American Falls Reservoir.

However, the pumps providing hatchery source water from wells would be designed and operated to minimize sediment entrainment. Measures to achieve this would include fitting wells with well screens and filter packs to eliminate or considerably reduce sand production, flushing waste sand upon pump startup for up to one hour, and incorporating sand traps to contain sand. The traps would be periodically emptied and the sand disposed at an on-site upland location. Furthermore, sand production would likely decrease substantially during continuous pumping. During well tests, water from wells was visually cloudy after the initial startup but became clear later in the tests (SPF Water Engineering 2010).

Alternative 1 would have the potential to directly affect water quality in McTucker 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, and dissolved solids, all of which have the potential to affect downstream water quality and biological resources dependent on aquatic environments. Such pollutants could be harmful to aquatic life such as fish and aquatic insects. Potential impacts would be avoided by adhering to NPDES permit and wasteload allocations under the current 2012 TMDL report (IDEQ et al. 2012), and by conducting operations in compliance with IDEQ discharge and monitoring requirements, including the dissemination of all monthly, quarterly, and annual discharge and monitoring reports as required by law and permits. Permits and compliance reports (current and historical) would be available upon request.

The potential release of suspended and dissolved organic solids into McTucker 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 contribute to eutrophication, which is associated with undesirable effects including algal blooms and nuisance 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 cited in Section 3.5.1.1, *Crystal Springs Hatchery Site*, are supported. Ultimately, the goal of water quality standards and a TMDL plan is to support beneficial uses in Idaho lakes and streams. Some numeric water quality standards are directly applicable to conditions in the American Falls subbasin, including 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 (IDEQ et al. 2012). The waste load allocations for the *American Falls Reservoir Subbasin Total Maximum Daily Load Plan* were established for total phosphorus, 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. IDEQ determined that phosphorus is the primary nutrient causing growth of algae in American Falls Reservoir.

In the *American Falls Reservoir Subbasin Total Maximum Daily Load Plan* (IDEQ et al. 2012), the target for total phosphorus was set at 0.05 milligrams per liter (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 and 2012 reports. In addition, the 2012 TMDL report 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 (IDEQ et al. 2012).

Based on waste load allocations in the 2012 *American Falls Reservoir Subbasin Total Maximum Daily Load Plan* (IDEQ et al. 2012) prepared by IDEQ and approved by EPA, specific discharge allocations were established for the proposed Crystal Springs hatchery. The allocations were 0.78 tons per year of phosphorus and 166 tons per year of suspended sediment. The allocations took into account nutrient and sediment discharges from the Idaho Fish and Game Springfield Sockeye Salmon Hatchery, which also discharges to a tributary to American Falls Reservoir (IDEQ et al. 2012).

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 and the Pacific Northwest Fish Health Protection Committee (USFWS 2016a). Discharge water quality would also be compared with pertinent State of Idaho water quality plans related to temperature, nutrient loading, and chemicals.

Under Alternatives 1, solids (i.e., feces and uneaten food) would be collected from the rearing ponds and settled in a sedimentation pond for eventual disposal (land application) at an off-site location (the Legacy Springs Wildlife Area). Specifically, concentrated solid wastes from juvenile circular ponds used for rearing would be collected in the central drain of each pond and conveyed via pipe to a dual-cell off-line settling pond located on the hatchery site. The two settling pond cells would be sized to treat the peak cleaning waste flow from the facility and would allow one cell at a time to be dewatered and cleaned out without interrupting normal hatchery operations. The settling ponds would be designed to meet guidelines of the IDEQ (IDAPA 58.01.02) and EPA (40 CFR 122.24) for confined animal feeding operations. Because of these measures, the potential for impacts on dissolved oxygen, nutrient enrichment, turbidity, and sedimentation in downstream waters due to the release of organic solids associated with the proposed hatchery operations is considered to be low.

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 salmon 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. 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* (40 CFR Part 451), which establishes narrative limitations for aquaculture chemicals. Because the use of these therapeutic chemicals would follow accepted standard practices and treatment applications would be applied only when necessary and typically would be of short duration, the potential impacts on 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. All chemical handling, application, and disposal would adhere to U.S. Department of Agriculture (USDA) and U.S. Food and Drug Administration Center for Veterinary Medicine (CVM) regulations and other state and federal regulations to protect human and environmental health. Additionally, staff would be trained in the proper use, transport, handling, and storage of all chemicals to minimize dangers of overexposure or accidental release to the environment. A SPCC plan would be required by IDEQ and implemented during construction. 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 captivity and the close proximity of rearing conditions would increase fish vulnerability to infection and disease transmission. This, in turn, could 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. The proposed hatchery would not discharge to waters that support ESA-listed anadromous salmonids. As a result, potential viral and bacterial pathogens from proposed hatchery operations would be prevented from entering streams that support ESA-listed populations.

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 Hatchery Program fish pathologist for appropriate action. For these reasons, potential impacts associated with increased risk of disease are **low**.

Construction of the Crystal Springs hatchery facility could result in low increases in turbidity following rainfall events. Operational impacts could result in the effluent discharge containing low concentrations of nutrients derived from fish waste and excess feed, as well as therapeutic chemicals; however, these impacts would be minimized through the use of BMPs resulting in **low** impacts on water quality.

### Water Quantity

The proposed Crystal Springs hatchery in Alternatives 1 and 2 would use groundwater provided by two existing wells (Wells #1 and #5) tapping the surficial aquifer and three new wells (Wells #7, #8, and #9) tapping the ESPA[3] (Figure 2-3). Existing Wells #4 and #6 would be abandoned, and existing Wells #2 and #3 would continue to flow to the adjacent ponds. The total flow from the six existing wells (Wells #1 through #6) was estimated at 11 cfs in 2010 (SPF Water Engineering 2010). The ESPA's productivity has decreased in recent years, which has probably decreased flows at the

[3] The surficial aquifer and the ESPA are two separate aquifers.

existing wells. These declines are likely related to multiyear drought conditions and increased water use by area irrigators (SPF Water Engineering 2010). Water use needs of the hatchery are shown in Table 2-1 and range from 3.1 cfs in April to a peak of 23.2 cfs in March. In an average water year, artesian flows would be adequate to meet hatchery demand for at least seven months (April through October), but during the peak water use months (November through March) the three new wells (Wells #7, #8, and #9) likely would need to be pumped to meet water supply demand during peak fish-rearing periods.

When equipped with pumps, the existing and proposed new wells would be able to produce the required peak month hatchery supply of 23.2 cfs even if deep groundwater levels declined. Because of ESPA's long-term declining trend, a corresponding increase in pumping lifts would 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 impacts on the ESPA. Although preliminary analysis indicates the hydraulic head (the combined measure of the elevation and the water pressure at a point in an aquifer which represents the total energy of that water) could be drawn down in the vicinity of the wells from its current level 6 to 8 feet above ground surface to about 30 to 40 feet below ground surface (assuming pumping over a four-month period during peak pumping, November through March [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 constitutes a negligible portion of regional withdrawals from the ESPA. A maximum pumping rate of 23.2 cfs over four months produces a total withdrawal of approximately 6,800 acre-feet of water (SPF Water Engineering 2010). The irrigation use in the ESPA during the same period is approximately 500,000 acre-feet, with an annual withdrawal rate exceeding 7.5 million acre-feet (Contor et al. 2004); thus, the hatchery's use would represent approximately 0.001% of regional ESPA withdrawals, and would occur during a time of year when irrigation withdrawals are relatively low. Additionally, within the vicinity of the hatchery site, the ESPA exhibits relatively high transmissivity (the rate at which groundwater travels horizontally) at approximately 500,000 gallons per day per foot, which allows for the relatively free movement of water. Even after the period of peak pumping demand (23.2 cfs in March), sufficient transmissivity exists to allow water levels to return to pre-pumping conditions with relatively little lag time. As mentioned previously in this section, artesian flow would be sufficient to supply hatchery demand for the remainder of the year under current conditions.

Because impacts on the regional groundwater supply resulting from the proposed Crystal Springs hatchery in Alternatives 1 and 2 would be localized and would not result in permanent changes in water levels, the impacts on groundwater quantity would be **low**.

Groundwater withdrawal (existing Wells #1 and #5) and abandonment (existing Wells #4 and #6) of wells on the proposed hatchery site may impact surface water flow of water to the adjacent ponds, which feed McTucker Creek. The ponds and McTucker Creek are fed in part from the spring adjacent to the proposed hatchery site. Based on discharge measurements, most of the source water to those ponds is provided through a 4-inch casing in the top pond and existing Well #3. These combined sources contribute approximately 6–7 cfs to the top pond, which flows through the four lower ponds. Alteration of this flow is not proposed. Wells #4 and #5 also flow to the lower ponds. Based on measurements collected on May 1, 2015, they contribute approximately 4 cfs. Output from these wells would be diverted for hatchery use. Discharge from the lowermost pond to McTucker Creek on May 1, 2015, was approximately 11 cfs, which is consistent with earlier estimates (SPF

Water Engineering 2010). Well #2 would be operated to discharge to the ponds, compensating for the flow lost by the diversion of Wells #4 and #5 for hatchery use. The amount of water contributed by Well #2 is not known at this time. If water levels in the ponds decrease, the Tribes would use stoplogs (a structure consisting of boards dropped into a premade slot inside a gate to prevent water flow that can later be removed) between the ponds to maintain pond levels. This practice was used at the historical hatchery formerly operated at the site, and the facilities for stoplog placement and removal are already in place at the pond outlets.

The source springs that feed the ponds originate from a surficial aquifer located at a depth of up to 25 feet below ground surface. This is thought to be isolated from the deeper ESPA aquifer that would be used by the new and existing hatchery wells (SPF Water Engineering 2010). The new hatchery wells would be constructed to depths of between 260 to 280 feet below ground surface, while the existing wells on site are believed to be at depths of 155 to 190 feet below ground surface based on well logs from Wells #5 and #6. Due to the substantial separation between these aquifers, well water withdrawals are not expected to affect the source springs that feed the ponds.

Flows within McTucker Creek would increase seasonally during the operation of the hatchery due to discharge of hatchery source water pumped from the deeper aquifer. The increase in flow, based on seasonal hatchery operational needs, would range from a minimum of 3.1 cfs in April to a peak of 23.2 cfs in March. Water backs up into McTucker Creek as the American Falls Reservoir fills through the spring, and the reservoir is generally highest in late spring as snowmelt fills the reservoir. Thus, the higher discharges from the hatchery in March should not result in substantial changes in flow or depth within McTucker Creek when compared to the magnitude of annual variations.

Therefore, impacts on groundwater and surface water from proposed Crystal Springs hatchery water use would be **low**.

## Yankee Fork Weir Facility

### Water Quality

Construction of the proposed facilities at Yankee Fork under Alternative 1 would include construction of the adult holding and spawning facilities and the road realignment in the uplands, a water intake and piping to supply the holding facilities, a permanent weir, and a fish ladder that would discharge the flow-through water back to the Yankee Fork. The permanent water intake, bridge weir, and fish ladder would require in-channel construction.

Construction of the upland facilities and road realignment could result in runoff from the construction site to the Yankee Fork. An NPDES permit, erosion and sediment control plan, and SPCC plan for all construction activities would be obtained prior to ground-disturbing activities and implemented during construction. Several factors would minimize the potential for water quality impacts during construction: the proposed adult holding and spawning facilities at Yankee Fork lie on relatively flat ground, 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 (see Section 3.5.3, *Mitigation*). In general, a sediment and erosion control plan and SPCC plan would be prepared and approved by IDEQ and the USFS; silt fencing would be installed along the perimeter of the construction site; stockpiled excavated materials would be protected from water or wind erosion by covering where appropriate; and any surface water (rain) would be detained on site and filtered before discharge. The water intake, weir, and fish ladder within the Yankee Fork would be installed during the dry season within the approved in-water work window to protect listed salmonids; the site would be dewatered during installation; only precast concrete would be used; and turbidity curtains would be used to minimize the potential for sediment introductions to surface waters from the installation of in-stream structures. A number of additional BMPs would be required for the in-channel work, including that all equipment operating within the dewatered channel would be washed and dried and inspected regularly to ensure that it is properly functioning and leak-free. All cleaning and refueling activities would occur at least 300 feet from surface waters to minimize the potential for wash water and fuels to enter the Yankee Fork.

The weir and fish ladder would be constructed in three phases. During Phase 1, a lined diversion channel would be constructed on the west bank of the Yankee Fork to facilitate the diversion of water around the weir/fish ladder construction site. During Phase 2, the diversion channel would be breached, coffer dams made with plastic lined soil sacks (sand bags filled with clean native material) would be installed at the upstream and downstream ends of the diversion channel to facilitate the diversion of water into and out of the channel and provide a dewatered construction area for the weir and fish ladder. Further, a turbidity curtain would be installed below the downstream coffer dam. During Phase 3, the coffer dams would be slowly removed to return flow through the construction site, and the diversion channel would be filled and restored to preconstruction conditions.

Because of these conditions and implementation of mitigation measures and BMPs, the potential for temporary impacts on surface water quality from construction of the Yankee Fork weir facilities would be **moderate** during and for a short period following construction, and **low** through the life of the facility.

The Yankee Fork weir facility would operate from June through October to collect and spawn returning Chinook salmon adults. The weir would be operational from June through August; Chinook salmon would be collected at the weir and moved to holding ponds. The adults would be retained in the holding ponds until they are ready for spawning through September and October. From June through October, approximately 10 cfs of water would be diverted from the intake in the Yankee Fork through the holding facilities and back to the Yankee Fork through the fish ladder. This operation does not include fish feeding, only holding of the adults for spawning; thus, organic solids associated with feed would not be discharged to the Yankee Fork.

Adult Chinook salmon would be held in the holding ponds until they have matured for spawning (typically late September and early October). It is possible that the adult fish may need to be treated with formalin in the event of thermal stress during holding or an observable outbreak of infections in the holding ponds. Any such treatments would be prescribed at doses consistent with use of therapeutic chemicals within hatcheries as regulated under EPA's *Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category* (EPA 2004), which establishes narrative limitations for aquaculture chemicals. In addition, the handling, application, and disposal of formalin would adhere to USDA and CVM regulations and other state and federal regulations to protect human and environmental health. Staff would be trained in the proper use, transport, handling, and storage of formalin to minimize dangers of overexposure or accidental release to the environment. Appropriate safety equipment would be provided, and formalin would be stored in areas designed to contain all material in the event of a leak or accidental spill. Any used absorbent materials would be disposed consistent with the applicable federal, state, and local regulations.

The most conservative concentration of formalin application to protect aquatic life in the mixing zone of the water to be discharged is 1 part per million (ppm) (1 mg/L) (FDA 1995) to avoid damage to formaldehyde-sensitive species. The Food and Drug Administration reviewed bioassays of a wide range of species, and ostracods (very small crustaceans) were the most sensitive with a 50% mortality (LC50) at 1.15 ppm. The species evaluated which could occur in Yankee Fork or Panther Creek (trout, salmon, frog tadpoles, Daphnia spp.) had LC50 values orders of magnitude higher (LC50 of 21 to 300 ppm formalin). Freshwater clams and backswimmers (an aquatic insect) showed even higher LC50s (800 and 4,500 ppm formalin, respectively). Thus, the Food and Drug Administration determined that a safe level for discharges following formalin treatment would be 1 ppm of formalin in the mixing zone, based on ostracods.

In a scenario where the on-site staff determines there is a concern of pathogen infections to fish being held at the facility, they would recommend a formalin treatment. A real-time discharge measurement of the river at the bottom of the fish ladder would be taken to verify mixing potential.

If a formalin treatment is considered necessary for fish health, the on-site staff would block the entry to the fish ladder, leaving the weir pickets in place to temporarily preclude upstream passage of target species. The staff would use the water control valves located at the spawn shed to turn off flows to each of the affected holding ponds that would be treated with formalin (the pre-sort pond would not be treated). The result would be a stop of flows into the holding ponds and an emptying of the pre-sort pond and fish ladder, which would result in no discharge from the ponds to Yankee Fork during the formalin treatment.

The weir staff would then employ an aeration system to prevent low oxygen levels in the holding ponds while the one-hour treatment is applied through the formalin drip system from the chemical storage shed directly to the holding ponds. The staff would turn on the formalin treatment using the control valves located in the chemical storage shed and monitor fish behavior and chemical concentrations. Dosage would be controlled by volume of formalin to water quantity in the holding ponds, to a maximum treatment level of 250 ppm.

After 45 minutes, the staff would cease formalin treatments and begin pumping water from each holding pond into the pre-sort pond. They would monitor the discharge concentrations of formalin to ensure it is not exceeding 1 ppm at the bottom of the fish ladder. The volume of water being pumped out of the holding ponds would be controlled by the water control valves located at the spawn shed. After 15 minutes, the entire volume of both holding ponds would be replaced with untreated water from the intake and the discharge point of compliance would measure less than 1 ppm of formalin.

The weir operator would re-open the water control valves supplying flow to the fish ladder from all three ponds at the facility, and would monitor water quality for any trace of formalin. Once it is confirmed that all three ponds and the fish ladder are free of formalin, the weir operator would re-open access to the fish ladder so upstream passage could resume with normal operations.

If conditions warrant it, this treatment cycle can be utilized once per day for a period of seven days if pathogens remain present and water temperatures remain high for fish being held at the facility.

Because the use of formalin would follow accepted standard practices performed only by appropriately trained staff, treatment applications would be applied only when necessary, dosages would be at levels not harmful to fish or other biota, and treatments would be of short duration, the potential impacts of formalin treatment on the Yankee Fork water quality would be **low**.

Fish acclimation for Chinook salmon smolts during the spring (April through June) would occur in previously dredged ponds upstream of the facility, and would not require diversion or discharge of water. These fish would not be fed in the off-channel ponds during their acclimation and would volitionally migrate (i.e., would leave on their own). Although there may be organic solids (i.e., feces) produced in the pond due to smolts feeding on native prey, the potential for effects on water quality in the Yankee Fork would be **low** because fish would be acclimated in batches and the organic solids would not be highly concentrated. No therapeutic chemicals would be used during acclimation.

#### Water Quantity

The proposed permanent Yankee Fork weir facility would require the diversion of approximately 10 cfs of water from the Yankee Fork through the adult holding facilities. Since the facility is a non-consumptive use, the entire water volume would be discharged back to the Yankee Fork approximately 1,260 feet below the intake via the fish ladder. The water diversion would occur between June and mid-October of each year when the monthly mean flow of the Yankee Fork would range between 934 cfs and 73 cfs, (USGS 2015a); thus, the diversion would vary between a spring minimum of 1% of Yankee Fork flow, and a late summer maximum of 14% of Yankee Fork flow (Table 3.5-1). These flow changes would only affect the 1,260 feet of the Yankee Fork located between the intake diversion and the discharge.

The proposed Yankee Fork weir facility would not require water diversion for acclimation of Chinook salmon smolts in the spring. The smolts would be acclimated in existing ponds connected to the river.

For these reasons, impacts on the flows in the Yankee Fork from Alternative 1 would be localized, would not result in a basinwide or annual decrease in flow, and would, therefore, be **low**.

#### Wild and Scenic Rivers

Alternative 1 would not change the quality of Yankee Fork's water downstream from the proposed facility. Construction activities may impact water quality for short periods of time, but mitigation measures and BMPs would be followed to minimize this short-term effect. The acclimation and adult holding facilities and operations would not impact water quality since fish in both facilities would not be feeding or producing wastes that would otherwise be discharged. In the long term, water quality would remain unchanged and there would be no adverse impact on this outstandingly remarkable value, and no effect on the Yankee Fork potential for future designation as a Wild and Scenic River.

### Panther Creek Weir Facility

#### Water Quality

Construction of the proposed facilities at Panther Creek under Alternative 1 would include construction of the adult holding and spawning facilities and acclimation ponds in the uplands, two water intakes (on Panther Creek [10 cfs] and Dummy Creek [1 cfs]) and piping to supply the holding and acclimation facilities, the weir, a discharge outfall from the acclimation facilities, and a fish ladder that would discharge the flow-through water back to Panther Creek. The water intakes, acclimation pond discharge, bridge weir, and fish ladder would require in-channel construction.

Construction of the upland facilities could result in runoff from the construction site to Panther Creek. An NPDES permit, erosion and sediment control plan, and SPCC plan for all construction activities would be approved prior to ground-disturbing activities. Several factors would minimize potential water quality impacts during construction: the proposed adult holding and spawning facilities at Panther Creek lie on relatively flat ground, 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 (see Section 3.5.3, *Mitigation*). Similar to the Yankee Fork site, a sediment and erosion control plan and SPCC plan would be prepared and approved by IDEQ and USFS; silt fencing would be installed along the perimeter of the construction site; stockpiled excavated materials would be protected from water or wind erosion by covering where appropriate; and any surface water (rain) would be detained on site and filtered before discharge. Further, the water intakes, acclimation pond discharge, weir, and fish ladder within Panther Creek would be installed during the dry season; the sites would be dewatered during installation; and turbidity curtains would be used to minimize the potential for sediment introductions to surface waters from the installation of in-stream structures. A number of additional BMPs would be required for the in-channel work, including that all equipment operating within the dewatered channel would be washed and dried and inspected regularly to ensure that it is properly functioning and leak-free. All cleaning and refueling activities would occur at least 300 feet from surface waters to minimize the potential for wash water and fuels to enter Panther Creek.

Like the facilities on the Yankee Fork, the weir and fish ladder would be constructed in three phases. During Phase 1, a lined diversion channel would be constructed on the west bank of Panther Creek to facilitate the diversion of water around the weir/fish ladder construction site. During Phase 2, the diversion channel would be breached, and coffer dams made with plastic-lined soil sacks (sand bags filled with native material) would be installed at the upstream and downstream ends of the diversion channel to facilitate the diversion of water into and out of the channel and provide a dewatered construction area for the weir and fish ladder. Further, a turbidity curtain would be installed below the downstream coffer dam. During Phase 3, the coffer dams would be slowly removed to return flow through the construction site, and the diversion channel would be filled and restored to preconstruction conditions.

Because of these conditions and mitigation measures, the potential for temporary impacts on surface water quality from construction of the Panther Creek weir facilities would be **low**.

Under Alternative 1, the Panther Creek weir facility would operate from June through October to collect and spawn returning Chinook salmon adults. The weir would be operational from June through August; Chinook salmon would be collected at the weir and moved to holding ponds. The adults would be retained in the holding ponds until they are ready for spawning in September and October. From June through October, water would be diverted from the Panther Creek intake through the holding facilities and out the fish ladder. This operation does not include fish feeding, only holding of the adults for spawning; thus, organic solids associated with feed would not be discharged to Panther Creek.

It is possible that adult fish would be treated with formalin in the event of thermal stress or infection during holding. The same process to minimize any formalin discharge to 1 ppm or less described for Yankee Fork treatments would be used for Panther Creek (see the environmental consequences discussion for the Yankee Fork weir facility).

The handling, application, and disposal of formalin would adhere to USDA and CVM regulations and other state and federal regulations to protect human and environmental health. In addition, staff would be trained in the proper use, transport, handling, and storage of formalin to minimize dangers of overexposure or accidental release to the environment. Appropriate safety equipment would be provided, and formalin would be stored in areas designed to contain all material in the event of a leak or accidental spill per the SPCC plan. Any used absorbent materials would be disposed consistent with the applicable federal, state, and local regulations.

To minimize the potential for the need for therapeutic treatments with formalin, the Panther Creek facility proposes to use up to 1 cfs of colder water diverted from Dummy Creek to reduce thermal stress in the facility. Actual diverted water from Dummy Creek would be subject to confirmation and permitting of a water use permit by the Idaho Department of Water Resources and USFS.

Fish acclimation (for Chinook salmon smolts) during the spring (April through June) would occur in 10 temporary, preconstructed ponds located on the west bank upstream of the facility, and would use 3 cfs of water diverted from the Panther Creek intake. Water from the acclimation ponds would be discharged between the intake and the weir.

During acclimation, the fish would be fed at 30–40% rations. Feeding levels for fish being acclimated at Panther Creek would range from 0.8–1.0% body weight per day. The total acclimated release group is about 80,000 smolts, at 10 fish per pound maximum, or 8,000 total pounds of smolts per group. The fish feed requirements are roughly 64–80 pounds of fish meal per day for three-day cycles per release group, or a maximum of 192–240 pounds of diluted fish waste each week for five weeks. The feeding schedule would further be compressed if the Tribes are directed through the permitting process to release smolts directly into the river without acclimation or with fewer days of acclimation.

Although there would be organic solids produced in these ponds, the potential for effects on water quality in Panther Creek would be low because fish would be acclimated in smaller batches and the discharged organic solids would not be highly concentrated. Discharge from the ponds when fish are acclimated would be 3 cfs. The monthly average flow in Panther Creek during April is 131 cfs, which would provide a dilution of up to 44 times.

No therapeutic chemical use is anticipated during acclimation.

Because of these conditions and implementation of mitigation measures and BMPs, the potential for temporary impacts on surface water quality from construction of the Panther Creek weir facilities would be **moderate** during and for a short period following construction, and **low** through the life of operating the facility.

#### Water Quantity

The proposed permanent Panther Creek weir facility would require the nonconsumptive diversion of water for the acclimation ponds, used in April and May; and for the adult holding facilities, used from June to September.

To service the acclimation ponds, approximately 3 cfs of Panther Creek water would be diverted in April and May. During those months, Panther Creek mean monthly discharges would range from 131 cfs to 381 cfs. This would result in 2% to less than 1% of Panther Creek flows that would need to be diverted for the acclimation ponds (USGS 2015b). The diverted water would be returned to the river approximately 700 feet downstream from the intake.

To service the adult holding facilities, approximately 10 cfs of Panther Creek water would be diverted between June and mid-October. During those months, Panther Creek mean monthly discharges would range from 197 cfs to 34 cfs. This would result in 5% to 29% of Panther Creek flows that would need to be diverted for the facility (USGS 2015b) (Table 3.5-1). The diverted water would be returned to the river approximately 1,150 feet downstream from the intake via the fish ladder.

The proposed Panther Creek weir facility would also divert up to 1 cfs of water from Dummy Creek, if flow is available. Dummy Creek is a cold, spring-fed stream, and this water would be diverted to achieve lower water temperatures in the adult Chinook salmon holding tanks at the facility. The diversion of Dummy Creek would only occur if the temperature in water diverted from Panther Creek were to exceed 62 °F and only if sufficient flow to support a water use permit existed in Dummy Creek. Water diverted from Dummy Creek would be discharged to Panther Creek through the fish ladder.

These impacts on flows in Panther Creek would be localized, would not result in a basinwide or annual decrease in flow, and would, therefore, be **low**.

#### Wild and Scenic Rivers

The effect of withdrawing between 20 and 30% of the flow from Panther Creek from mid-August through mid-October, when stream temperatures are likely a concern, would be expected to have measurable and visible effects in the 0.25-mile stretch affected. However, these withdrawals would be non-consumptive (the water would be returned to the river below the facility with no measurable loss of volume), would be limited in duration, and would affect a 0.25-mile segment of the 45-mile-long Panther Creek eligible Wild and Scenic River. Impacts on the Wild and Scenic River “free-flowing” character are expected to be **moderate**.

### 50% Production of Chinook Salmon Option

#### Water Quality

##### *Crystal Springs Hatchery Site*

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, Alternatives, Including the Proposed Action, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, under the reduced production option, the impacts on water quality would be similar to those described for the proposed hatchery facility for full production under Alternative 1. The hatchery facility would still be built as proposed, and construction-related discharges would have similar potential effects on the environment as those described for the full production of Alternative 1.

Although production of Chinook salmon would be reduced by 50% under the reduced production option, the potential effects of this option would be the same for potential operations-related impacts. The majority of water used (both volume and duration), and thus discharged, during production of Chinook salmon is related to rearing juveniles at the hatchery. Both broodstock collection and smolt acclimation use small proportions of surface water and, because the facilities operated under Alternative 1 and flow requirements for holding fish in these areas would be the same as under full production, reductions in water use and discharge (e.g., low concentrations of nutrients and sometimes therapeutic chemicals) would be minimal or non-existent. Therefore, this would not result in measurable change in the conclusions regarding the potential effects of full production under Alternative 1 and impacts would be **low**.

#### *Yankee Fork and Panther Creek Weir Facilities*

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Impacts on water quality during construction of the Yankee Fork and Panther Creek weir facilities would be the same as those described above for full production of Alternative 1 because the weirs would be constructed in the same manner as described for full production. These impacts would be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, weir facility operations would discharge low concentrations of nutrients and sometimes therapeutic chemicals. These impacts would be **low**. Marine-derived nutrients from fish carcasses left in the stream channel would provide a moderate beneficial impact in Yankee Fork and Panther Creek.

### Water Quantity

#### *Crystal Springs Hatchery Site*

As mentioned above, the Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Construction of hatchery facilities would have a **low** impact on water quantity.

Although production of Chinook salmon would be reduced by 50% under the reduced production option, water use at the Crystal Springs hatchery site would be the same as for full production for Alternative 1. Production of Yellowstone cutthroat trout would not be affected by the reduced production option and would be the same as for Alternative 1 and Alternative 2. The density of fish at the proposed hatchery would be reduced and, therefore, impacts on water quantity at the Crystal Springs hatchery site would be the same or less than as those described above for the Crystal Springs hatchery, and would be **low**. Localized withdrawals of groundwater from the East Side Plain Aquifer would occur under an existing water right, similar to full production; however, this impact is also considered to be **low**.

#### *Yankee Fork and Panther Creek Weir Facilities*

As mentioned above, permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Construction of the weir facilities would have a **low** impact on water quantity.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, water use at permanent Yankee Fork and Panther Creek weir facilities would be the same as under full production for Alternative 1. The quantity of water required for the sorting and holding ponds would remain the same. Potential impacts on water quantity at permanent Yankee Fork and Panther Creek weir facilities would be the same as those described above for the Yankee Fork and Panther Creek weir facilities. These impacts would be **low**.

### 3.5.2.2 Alternative 2: Hatchery Program with Temporary Weirs

#### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts on water quality and water quantity at the Crystal Springs hatchery would be the same as described under Alternative 1.

#### Yankee Fork Weir Facility

##### Water Quality

Under Alternative 2, there would be minimal impacts associated with the construction or operation of the temporary Yankee Fork weir or associated facilities. The Tribes would install a temporary weir to collect Chinook salmon. The weir would be installed and removed by hand with no equipment in the stream. No ground or surface water would be diverted or used for its operation. Adult Chinook salmon would be transported directly to the proposed Crystal Springs hatchery after capture. Turbidity impacts from setting and removing the weir pickets by hand would be considered minor. Therefore, there would be **low** impacts on water quality.

##### Water Quantity

Under Alternative 2, there would be **no** impacts on water quantity associated with the construction or operation of a temporary Yankee Fork weir or associated facilities. The Tribes would install a temporary weir to collect Chinook salmon (subject to USFS approval); however, no groundwater or surface water would be diverted or used for its operation.

#### Panther Creek Weir Facility

##### Water Quality

Under Alternative 2, impacts would be similar to those discussed under Alternative 2 for Yankee Fork. The Tribes would install a temporary weir to collect Chinook salmon. The weir would be installed and removed by hand with no equipment in the stream. No ground or surface water would be diverted or used for its operation. Adult Chinook salmon would be transported directly to the proposed Crystal Springs hatchery after capture. Turbidity impacts from setting and removing the weir pickets by hand would be considered minor. Therefore, there would be **low** impacts on water quality.

##### Water Quantity

Under Alternative 2, there would be **no** impacts on water quantity associated with the construction or operation of the Panther Creek temporary weir or associated facilities. If a temporary weir is approved for seasonal use by the USFS, no groundwater or surface water would be diverted or used.

## 50% Production of Chinook Salmon Option

### Water Quality

#### *Crystal Springs Hatchery Site*

Water quality impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### *Yankee Fork and Panther Creek Weir Facilities*

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand. As a result, there would be **low** construction-related impacts on water quality.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, impacts on water quality would be the same as those described above for full production under Alternative 2. Similar to full production, no water would be diverted or discharged at the Yankee Fork and Panther Creek weir sites. No water quality impacts from operations would be expected to occur as no chemicals would be stored on site, and no holding of adults would occur. Installation and removal of the temporary weirs would be by hand with no equipment in the stream channel and minimal disturbance to sediments would be expected. Impacts on water quality would be short term and **low**.

### Water Quantity

#### *Crystal Springs Hatchery Site*

Water quantity impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### *Yankee Fork and Panther Creek Weir Facilities*

As mentioned above, temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand. As a result, there would be **low** construction-related impacts on water quality and water quantity.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, impacts on water quantity would be the same as those described above for full production under Alternative 2. Similar to full production, no water would be diverted or discharged at the Yankee Fork and Panther Creek weir sites. Therefore, the reduced production option would have **no** impacts on water quantity, similar to that described above for the Yankee Fork and Panther Creek weir facilities under full production for Alternative 2.

# 3.5.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on water quality and water quantity during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.5.3.1 Alternative 1: Hatchery Program with Permanent Weirs

### Construction

#### Crystal Springs Hatchery Site

Implement the following measures to reduce impacts on water quality and water quantity during construction at the Crystal Springs hatchery site:

- Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and sediment-laden waters are drained 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.
- Wash heavy equipment that may work below the ordinary high water mark elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.
- Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.
- Inspect machinery daily for fuel or lubricant leaks.
- 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.
- To the greatest extent possible, minimize the size of construction disturbance areas and the removal of vegetation.
- 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 an SPCC plan that requires storage of fuel and other potential pollutants in a secure location at least 300 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 requires 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 regulations.
- Restrict refueling and servicing operations to locations at least 300 feet from streams, water bodies, and wetlands where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes); 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 300 feet away from any stream, water bodies, or wetland.
- 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; 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.
- Comply with the construction NPDES permit.
- Train all staff in regard to chemical handling and application safety.
- Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.

Modeling has indicated that the use of groundwater at the Crystal Springs hatchery site would have a low impact on the aquifers (SPF Water Engineering 2010). Observations at the Crystal Springs hatchery site have noted no change in artisanal water flow from the existing wells while the Springfield Hatchery has been operational; however, once pumps are installed and operational the Tribes would conduct a pump test on the proposed wells at the Crystal Springs hatchery site to determine actual effects on the groundwater resource during periods of peak water demand for fish rearing (March).

If water diversions to the hatchery result in reduced surface water levels in the existing ponds from the old hatchery, pond water levels would be maintained through placement of stoplogs in the existing racks at the pond outlets.

### Yankee Fork and Panther Creek Weir Facilities

Implement the following measures to reduce impacts on water quality and water quantity during construction at the Yankee Fork and Panther Creek weir facilities.

- Design and construct access roads such that drainage from the road surface directly into surface waters is minimized and sediment-laden waters are drained 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.
- Conduct in-water work during approved in-water work windows.
- Wash heavy equipment that may work below the ordinary high water mark elevation before it is delivered to the job site and after it is used to prevent the spread of aquatic invasive species.
- Inspect equipment to remove vegetation and dirt clods that may contain noxious weeds.
- Inspect machinery daily for fuel or lubricant leaks.

- 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.
- To the greatest extent possible, minimize the size of construction disturbance areas and the removal of vegetation.
- 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 an SPCC plan that requires storage of fuel and other potential pollutants in a secure location at least 300 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 requires 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 regulations.
- Restrict refueling and servicing operations to locations at least 300 feet from streams, water bodies, and wetlands where any spilled material cannot enter natural or human-made drainage conveyances (e.g., ditches, catch basins, ponds, wetlands, streams, pipes); 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 300 feet away from any stream, water bodies, or wetland.
- 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; 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.
- Comply with the NPDES permit.
- Comply with the TMDL allocations for the American Falls Reservoir subbasin.
- Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.
- Train all staff in regard to chemical handling and application safety.
- Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.

## Operations

### Crystal Springs Hatchery

Implement the following measures to reduce impacts on water quality and water quantity during hatchery operations at the Crystal Springs hatchery site:

- Comply with the NPDES permit for hatchery discharges.
- Comply with the TMDL allocations for the American Falls Reservoir subbasin.
- Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.
- Train all staff in regard to chemical handling and application safety.
- Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.

Modeling has indicated that the use of groundwater at the Crystal Springs hatchery site would have a low impact on the aquifers (SPF Water Engineering 2010). Observations at the Crystal Springs hatchery site have noted no change in artisanal water flow from the existing wells while the Springfield Hatchery has been operational; however, once pumps are installed and operational, the Tribes would conduct a pump test on the proposed wells at the Crystal Springs hatchery site to determine actual effects on the groundwater resource during periods of peak water demand for fish rearing (March).

If water diversions to the hatchery result in reduced surface water levels in the existing ponds from the old hatchery, pond water levels would be maintained through placement of stoplogs in the existing racks at the pond outlets.

### Yankee Fork and Panther Creek Weir Facilities

Implement the following measures to reduce impacts on water quality and water quantity during weir facility operations at the Yankee Fork and Panther Creek sites.

- Comply with all chemical handling, application, and disposal regulations by USDA and CVM regulations and other state and federal regulations to protect human and environmental health.
- Train all staff in regard to chemical handling and application safety.
- Design on-site chemical storage buildings to fully contain accidental spills of chemicals stored at the proposed facilities.
- If formalin is used, insure that the concentration of formalin in the discharge is at or below 1 mg/L.

# 3.5.3.2 Alternative 2: Hatchery Program with Temporary Weirs

## Construction

### Crystal Springs Hatchery

Implement the same mitigation recommended under Alternative 1 for construction of the Crystal Springs hatchery.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed as the temporary weir facilities would be installed by hand; no mitigation would be recommended.

### Operations

#### Crystal Springs Hatchery

Implement the same mitigation recommended under Alternative 1 for operation at the Crystal Springs hatchery.

#### Yankee Fork and Panther Creek Weir Facilities

No mitigation is required as the temporary weir would be placed and removed by hand and no water would be diverted or discharged.

## 3.5.4 No Action Alternative

Under the No Action Alternative, there would be no impacts associated with construction or operation of the proposed Crystal Springs hatchery. Site activities and current groundwater usage would continue unchanged from existing conditions. Similar to existing conditions, no pumping would occur, and the existing wells would continue to overflow. Therefore, there would be **no** impacts on water quality under the No Action Alternative.

Under the No Action Alternative, no facilities would be built at the Crystal Springs hatchery site, at the Yankee Fork site, or at the Panther Creek site, and no Chinook salmon or Yellowstone cutthroat trout would be captured, held, or acclimated that would require water diversion or discharge. Therefore, there would be **no** effects on water quality.

There would be no impacts on water quantity associated with construction or operation of the Crystal Springs hatchery or Yankee Fork and Panther Creek sites. Site activities and current groundwater usage would continue unchanged from existing conditions. Similar to existing conditions, no pumping would occur, and the existing wells would continue to flow under artesian pressure. Therefore, there would be **no** impacts on groundwater or surface water under the No Action Alternative.

# 3.6 Wetlands and Floodplains

This section describes the affected environment and environmental consequences, including direct and indirect effects and mitigation measures, associated with wetlands and floodplains, resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). For the analysis of direct impacts, the analysis area is limited to the individual sites proposed for the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek facility. For indirect impacts, the analysis area includes these sites and adjacent areas within 200 feet. For both the Yankee Fork and Panther Creek sites, which are located alongside streams, the indirect and cumulative impact analysis area also extends 0.25 mile downstream of each site.

Executive Order 11988 (42 CFR 26951), *Floodplain Management*, requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

Executive Order 11990 (42 CFR 26961), *Protection of Wetlands*, requires federal agencies to follow avoidance, mitigation, and preservation procedures and to obtain public input before proposing new construction in wetlands. Consistency with the overall wetlands policy contained in Executive Order 11990 is achieved through CWA Section 404 compliance requirements and the U.S. Army Corps of Engineers' preparation of the 404(b)(1) alternatives analysis.

As a part of the U.S. Department of Energy, Bonneville Power Administration's (BPA) responsibilities under Executive Orders 11990 and 11988 are defined under 10 CFR 1022. Under these rules, the U.S. Department of Energy is directed to accommodate the requirements of these executive orders through applicable National Environmental Policy Act (NEPA) procedures whenever possible. In addition, a floodplain or wetland assessment has been prepared and is discussed in Chapter 4, *Environmental Consultation and Coordination* (see Section 4.1.4.1, *Executive Orders 11988 and 11990*).

## 3.6.1 Affected Environment

### 3.6.1.1 Crystal Springs Hatchery Site

The Crystal Springs hatchery is located in Bingham County, Idaho, near the town of Springfield (Figure 2-1). It lies adjacent to Fort Hall Bottoms, a complex of sloughs, drainages, and wetlands that border the Snake River at the northeastern end of American Falls Reservoir, and is within the American Falls Reservoir Watershed of the Snake River subbasin, which is identified by the U.S. Geological Survey as Hydrologic Unit Code 17040206. The site consists of an approximately 19.7-acre property owned by the BPA that is located in a predominantly agricultural area characterized by extensive surface irrigated grain, sugar beets, potatoes, and alfalfa (McGrath et al. 2002). Average minimum and maximum temperatures range from 32° to 60° F, occurring December-January and July-August, respectively (Western Regional Climate Center 2015a). Average annual precipitation is approximately 11 inches, with the highest rainfall occurring between October and June.

## Wetlands and Non-Wetland Other Waters

Wetlands and non-wetland other waters on the Crystal Springs hatchery site were delineated in October 2012 using the methods outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the 2008 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (U.S. Army Corps of Engineers 2008). The results of this delineation were summarized in a January 23, 2013, memorandum prepared for the Shoshone-Bannock Tribes (Tribes) (McMillen, LLC 2013d). During this delineation, one on-site wetland (Wetland Crystal-A[1]) and two off-site non-wetland other waters (McTucker Creek and an unnamed side channel) were identified on the Crystal Springs hatchery site (Figure 3.6-1).

### Wetland Crystal-A

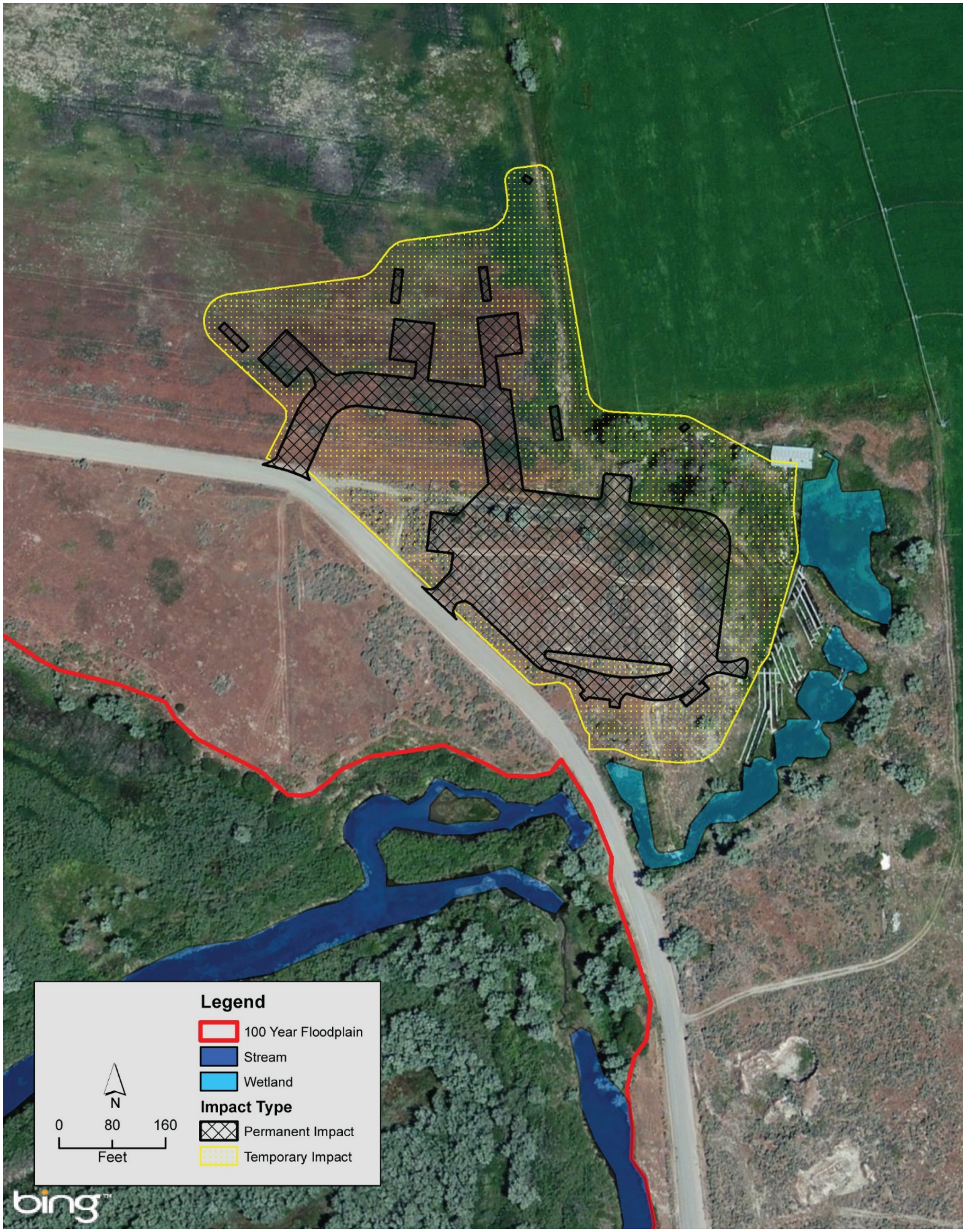
Wetland Crystal-A is located in and around the former hatchery rearing ponds on the eastern portion of the site (Figure 3.6-1). This wetland is approximately 1.12 acres in size and includes five excavated, open water ponds and the saturated areas that surround them. The western boundary of Wetland Crystal-A was delineated in the field, while the eastern boundary was estimated using aerial photos and the water elevations in the ponds (McMillen, LLC 2013d: 5). The abandoned hatchery raceways along the western edges of the ponds were not included in the wetland boundary. Wetland Crystal-A is characterized as a palustrine, emergent wetland (an inland wetland which lacks flowing water) under the U.S. Fish and Wildlife's (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979: 19-20) and as a depressional wetland (wetlands that may lose water through evaporation, intermittent or perennial outlets, or recharge to groundwater) under the Hydrogeomorphic Classification System (HGM) (Smith et al. 1995: 12-13).

Wetland Crystal-A is underlain by silty soils that contain both sand and gravel in varying quantities. Dominant vegetation includes cattail (*Typha* sp.) and watercress (*Nasturtium officinale*), interspersed with hardstem bulrush (*Schoenoplectus acutus*), trailing nightshade (*Solanum dulcamara*), and stinging nettle (*Urtica dioica*) (McMillen, LLC 2013d:5, A-2). Other species observed during the May 2014 site visit include American speedwell (*Veronica Americana*), curly-leaf pondweed (*Potamogeton crispus*), and creeping spikerush (*Eleocharis palustris*). Willow (*Salix* sp.), gooseberry (*Ribes* sp.), and rose (*Rosa* sp.) shrubs are also common along the pond banks.

Wetland Crystal-A includes both permanently flooded and semi-permanently flooded/saturated areas. Hydrology is provided by multiple natural springs, shallow groundwater, and artesian (non-pumped) flow from six established wells (SPF Water Engineering 2010: 1). The surrounding topography also directs sheet flow from precipitation and snowmelt runoff from the surrounding areas into Wetland Crystal-A; however, the overall hydrologic contribution of these sources is thought to be nominal (McMillen, LLC 2013d: 5). Flow within Wetland Crystal-A generally originates in the northeast corner of the site near the former hatch house where an existing spring feeds into the large northern pond from a pipe sunk into the springhead (Stone pers. comm. 2015e). According to a water supply assessment conducted on the site by SPF Water Engineering in 2010, this spring likely discharges from an overlying basalt, sand, and gravel aquifer zone located above a depth of approximately 25 feet below ground surface, while the wells that feed into the wetland seem to discharge from a sand and gravel aquifer present between 150 to 200 feet below ground surface. The degree of hydraulic connection between these two aquifers is unknown but likely limited due to the presence of multiple clay layers between 25 and 150 feet below ground surface (SPF Water Engineering 2010: 3).

[1] This wetland corresponds with 'Wetland A' (McMillen, LLC 2013).

**Figure 3.6-1. Existing Floodplains and Surface Waters, and Permanent and Temporary Impacts at the Crystal Springs Hatchery Site**



Flow from the northern pond is routed into a series of dilapidated concrete raceways that feed the four smaller ponds located downgradient to the south. These ponds are connected to each other by short concrete chutes that were formerly used for hatchery operations. Flow continues through the ponds to the south before exiting the site through a 36-inch corrugated metal pipe culvert under River Road. This culvert drains into an unnamed side channel of McTucker Creek, which eventually flows to the American Falls Reservoir. An irrigation pump is located in a narrowed segment of the southernmost pond just upstream from the culvert. This pump supplies water to the center pivot irrigator located on the adjacent site to the north and east.

During the 2012 delineation fieldwork and 2014 site visit, existing wells #3, #4, and #5 were actively discharging artesian flow into Wetland Crystal-A (Figure 3.6-1). Well #3 flows into the larger northern pond, while Wells #4 and #5 discharge into the raceways that feed into the two southernmost ponds. In the past, artesian discharge from Wells #1, #2, and #6 also flowed into the pond/wetland system (SPF Water Engineering 2010). Flow from Well #1 entered the system after passing through the former hatch house; flow from Well #2 discharged to a short channel that drains into the northernmost pond; and flow from Well #6 entered the pond/wetland system via an excavated drainage channel that flows into the southernmost pond.

The potential of Wetland Crystal-A to perform a variety of wetland functions was assessed using the *Montana Department of Transportation Montana Wetland Assessment Method* (MWAM) (Berglund and McEldowney 2008).[2] Wetland functions that received high ratings from MWAM included sediment/nutrient/toxicant removal, short- and long-term surface water storage, and groundwater discharge/recharge. Functions that received moderate ratings included provision of habitat for the Idaho Natural Heritage Program (i.e., sensitive) species, provision of general wildlife habitat, and production export/food chain support. Functions that received low scores included provision of habitat for Endangered Species Act (ESA) -listed species and wetland uniqueness. Using MWAM, it was determined that Wetland Crystal-A does not currently have the potential to provide general fish habitat, flood attenuation, sediment/shoreline stabilization, or recreation/education functions. Wetland Crystal-A was classified as a Category II wetland[3] because it provides incidental (i.e., suitable) habitat for an ESA-listed species (yellow-billed cuckoo) and secondary (i.e., occasionally used but not essential) and incidental habitat for several sensitive wildlife species (e.g., trumpeter swan, Swainson's hawk). This ranking was also based on the ability of Wetland Crystal-A to perform several wetland functions at high to moderate levels.

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[2] This is the standard method used to assess wetland functions and values in this region of Idaho by the U.S. Army Corps of Engineers, Walla Walla District.

[3] MWAM classifies wetlands into four categories based on the quality of the wetland, its ability to provide habitat for ESA-listed species, and its overall functional capacity and uniqueness (Berglund and McEldowney 2008: 31-33). Category I wetlands are exceptionally high quality and generally rare to uncommon in Idaho or they are wetlands that provide documented primary habitat for ESA-listed plants or animals. Category II wetlands are more common than Category I wetlands, provide habitat for sensitive plants and animals, have high fish and wildlife functional levels, and are either unique to the region or are assigned high scores for many of the assessed functions. Category III wetlands are more common than Category I or II wetlands and can provide many wetland functions but typically at moderate levels. Category IV wetlands are generally small, isolated wetlands that have often been directly or indirectly disturbed. They often lack vegetative diversity and provide little to no fish and wildlife habitat or other wetland functions.

#### Non-Wetland Other Waters

No non-wetland (rivers, intermittent and perennial streams, lakes, ponds, reservoirs, some artificially created ponds, and some ditches) or other waters occur on the Crystal Springs hatchery site. Non-wetland other waters present in the vicinity include McTucker Creek and an unnamed site channel (Figure 3.6-1), both located on the adjacent parcel to the west. Both of these streams are perennial and flow into the American Falls Reservoir through the Fort Hall Bottoms. The unnamed side channel is approximately 450 feet long and varies between 25 to over 50 feet in width. It receives drainage from Wetland Crystal-A via the 36-inch corrugated metal pipe culvert under River Road and conveys it into McTucker Creek. McTucker Creek is a spring-driven stream with a relatively flat gradient that has an average flow of approximately 196.2 cubic feet per second (cfs) at its mouth (IDEQ et al. 2012: 22, 99). It is approximately 2.24 miles long and originates to the east of the Crystal Springs hatchery site, near where the Snake River enters American Falls Reservoir. Channel width near its confluence with the unnamed side channel is approximately 70 feet. McTucker Creek is listed on the Clean Water Act Section 303(d) list for sediment as a pollutant of concern (see *Section 3.5, Groundwater and Surface Water Quality and Quantity*).

The unnamed side channel and McTucker Creek near the Crystal Springs hatchery site are both bordered by herbaceous and overhanging scrub-shrub vegetation. Species present include various willows, gooseberry, rose, cheatgrass (*Bromus tectorum*), Canada thistle (*Cirsium arvense*), musk thistle (*Carduus nutans*), and other native and nonnative grasses and forbs. Substrate seems to be primarily sand and mud with some gravel and cobble also present.

### Floodplains

Flood hazards in Bingham County were identified by the Federal Emergency Management Agency (FEMA) in the October 20, 1998, *Flood Insurance Study for Bingham County, Idaho Unincorporated Areas* and associated Flood Insurance Rate Maps (FIRM). According to the FIRM map for Community Panel No. 1600180600B (FEMA 1979), no FEMA-mapped floodplains are present on the Crystal Springs hatchery site (Figure 3.6-1). Off site, a FEMA-identified floodplain is mapped around the unnamed side channel and McTucker Creek on the parcel to the west of the site. This area is identified as Zone A, which includes areas of 100-year flood where base flood elevations and flood hazard factors have not been determined (FEMA 1979). As discussed above, this area is currently undeveloped and occupied by scrub-shrub and herbaceous vegetation.

## 3.6.1.2 Yankee Fork Weir Facility

### Wetlands and Non-Wetland Other Waters

Wetlands and non-wetland other waters on the Yankee Fork site were delineated in the field on July 6, 2013, using the 1987 Manual (Environmental Laboratory 1987) and the 2010 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Mountains, Valleys, and Coasts Region* (U.S. Army Corps of Engineers 2010). Results of this delineation were summarized in a February 19, 2014, report entitled *Crystal Springs Hatchery – Yankee Fork River and Panther Creek: Wetland and Stream Delineation Report* (McMillen, LLC 2014). During this study, two wetlands (Wetland Yankee-A and Wetland Yankee-B[4]) were identified on the Yankee Fork site. In addition,

[4] These wetlands respectively correspond with Wetland A and Wetland B, as identified at the Yankee Fork site (McMillen, LLC 2014).

the ordinary high water mark of Yankee Fork was also mapped in the analysis area. Conditions in each of these wetlands and the reach of the Yankee Fork within the analysis area are briefly discussed below.

### Wetland Yankee-A

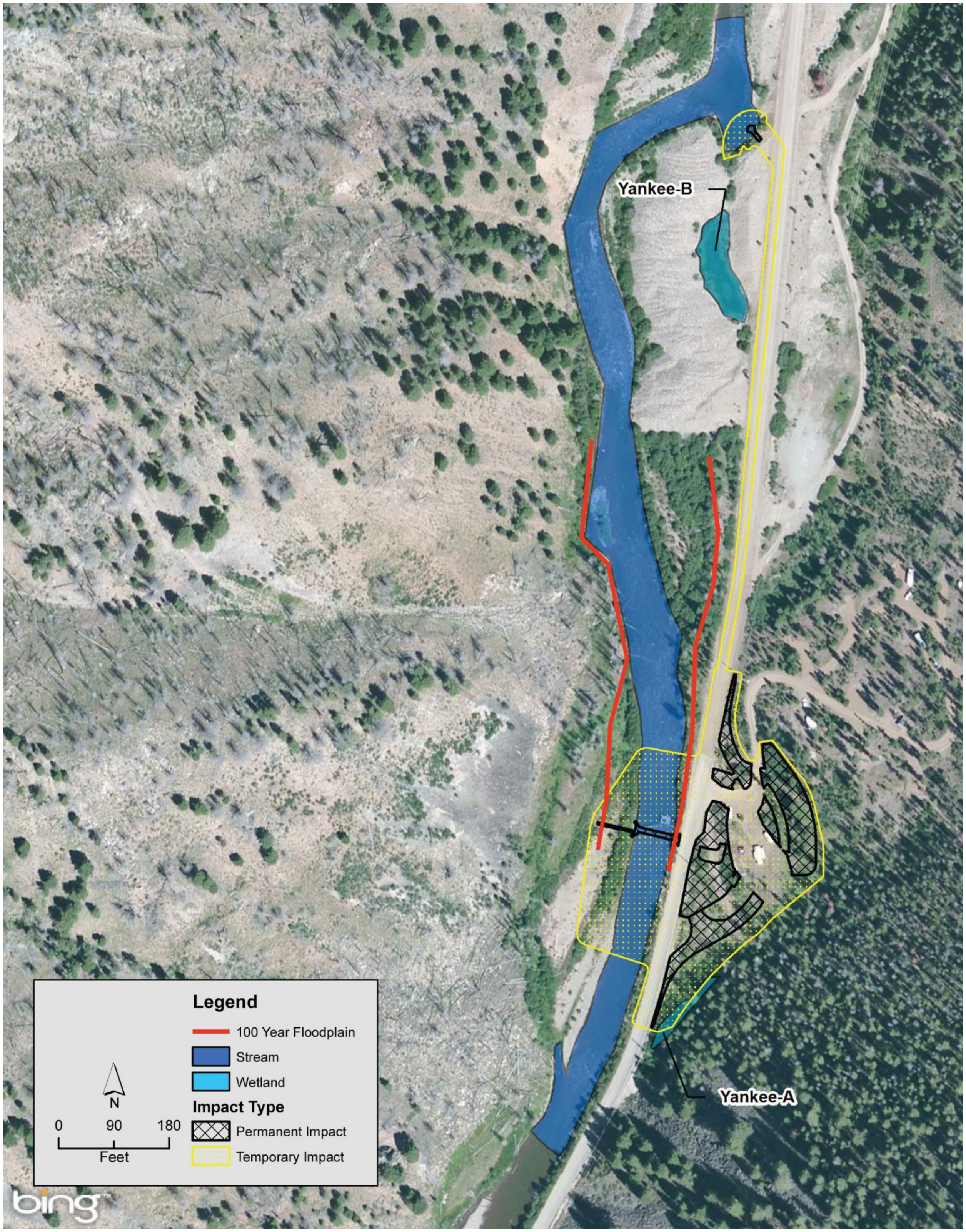
Wetland Yankee-A is located in the southern portion of the Yankee Fork weir facility, between Yankee Fork Road and the base of the adjoining hillside (Figure 3.6-2). It is approximately 0.06 acre in size and consists of a short drainage that conveys shallow surface flow into an 18-inch corrugated metal pipe culvert that extends under the road to the edge of Yankee Fork. Wetland Yankee-A is classified as a palustrine, scrub-shrub wetland under the USFWS system (Cowardin et al. 1979: 36–37) and a slope wetland under the HGM system (Smith et al, 1995: 13, 16). It was delineated based on a mild topographic break observed near the base of the slope, changes in the prevalence of upland and hydrophytic vegetation, and the presence of wetland hydrologic indicators (e.g., saturation and/or redoximorphic features in the upper 12 inches of the soil column) (McMillen, LLC 2013d: 11).

Wetland Yankee-A is primarily underlain by silty soils, with approximately 40% organic materials present in the upper 6 inches (McMillen, LLC 2014: 11, A-2). Adjacent upland soils are primarily loams with interspersed gravel and cobble. Dominant vegetation includes Geyer's willow (*Salix geyeriana*) and mountain alder (*Alnus incana*), with prickly black gooseberry (*Ribes lacustre*) and tall buttercup (*Ranunculus acris*) also present. Due to the dense shrub overstory, the herbaceous layer is sparse, with bare soil present through much of the wetland.

Hydrology for Wetland Yankee-A is provided by snowmelt and precipitation, and possibly groundwater seepage from the adjacent hillside. Although surface water is typically only present for relatively short periods, Wetland Yankee-A remains saturated in the upper 12 inches of the soil column nearly year-round due to a perched water table (McMillen, LLC 2014: 12).

The functional capacity of Wetland Yankee-A was assessed using MWAM. Wetland functions that received high ratings include flood attenuation and sediment/nutrient/toxicant removal. Functions that received moderate ratings include sediment/shoreline stabilization. Functions that received low ratings include provision of habitat for ESA-listed species, provision of habitat for Idaho Natural Heritage Program species, provision of general wildlife habitat, short- and long-term surface water storage, production export/food chain support, and wetland uniqueness. Based on the MWAM assessment, Wetland Yankee-A does not currently provide general fish habitat or recreation/education provision functions. Wetland Yankee-A was classified as a Category III wetland because it is a fairly common wetland type in the watershed and because of its ability to perform several wetland functions at low to moderate levels, as well as a few functions at high levels.

**Figure 3.6-2. Existing Floodplains and Surface Waters, and Permanent and Temporary Impacts at the Yankee Fork Weir Facility**



### Wetland Yankee-B

Wetland Yankee-B is located in the northern portion of the Yankee Fork site, on the west side of Yankee Fork Road (Figure 3.6-2). It occurs in an excavated, seasonally flooded depression that lies between two historic tailings piles left over from past gold mining activities in the stream channel. Wetland Yankee-B extends off site to the northwest, with the majority of its area located outside of the Yankee Fork site. The total size of this wetland is estimated to be approximately 0.17 acres, of which approximately 0.06 acre is located on the Yankee Fork site. Wetland Yankee-B is classified as a palustrine, unconsolidated bottom wetland under the USFWS system (Cowardin et al. 1979: 27–28) and a depressional wetland under the HGM system (Smith et al, 1995: 12–13). The delineated boundary of Wetland B generally followed the waterline of the ponded water present at the time of the July 2013 site visit (McMillen, LLC 2014: 12).

Wetland Yankee-B is underlain by unconsolidated dredge tailings including gravel, large cobbles, and boulders. Underlying soils could not be classified because the investigators could not dig through this material (McMillen, LLC 2013d: 12). Vegetation is sparse due to the lack of soil structure. Species present include scattered patches of Nebraska sedge (*Carex nebrascensis*) and a few white willow (*Salix alba*), Woods' rose (*Rosa woodsii*), and red-osier dogwood (*Cornus sericea*) shrubs, all of which occur along the perimeter of the ponded area.

Hydrology for Wetland Yankee-B is provided by shallow groundwater, which fluctuates seasonally with the rise and fall of the water in the Yankee Fork channel. Approximately 3 feet of standing water was observed in the wetland both at the time of the delineation on July 6, 2013, and during the 2014 site visit. Hydrology seems to be present year round (McMillen, LLC 2014: 12). The hydrologic regime of Wetland Yankee-B is likely permanently flooded.

The functional capacity of Wetland Yankee-B was assessed using MWAM. Of the functions assessed, groundwater discharge/recharge is the only function that received a high rating. Functions that received moderate ratings included short- and long-term surface water storage and sediment/nutrient/toxicant removal. Low-rated functions include provision of habitat for ESA-listed species, provision of habitat for Idaho Natural Heritage Program species, provision of general wildlife habitat, and production export/food chain support. Wetland Yankee-B does not currently provide general fish habitat, flood attenuation, sediment/shoreline stabilization, or recreation/education provision functions. Wetland Yankee-B was classified as a Category IV wetland due to its location in a highly disturbed area (dredge tailings pile) and its limited ability to perform most wetland functions.

### Non-Wetland Other Waters

Non-wetland other waters at the Yankee Fork site include Yankee Fork, a perennial stream that is one of the larger tributaries to the Salmon River (Figure 3.6-2). Yankee Fork drains approximately 122,000 acres, originating to the north of the site in the Salmon-Challis National Forest near Challis Creek Lakes at an elevation of approximately 8,800 feet. From there it flows approximately 28 miles toward the south to its confluence with Salmon River near River Mile (RM) 368 near Sunbeam, Idaho (Reclamation 2012d: 13). It is primarily driven by an annual spring freshet from snowmelt, with the high flows typically occurring from late May through June, receding down to baseflow from August through February (Reclamation 2012b: F7).

The proposed Yankee Fork weir facility is located at RM 3.2 of the Yankee Fork near the USFS Pole Flat Campground. It is near the downstream end of Geomorphic Reach YF-2 of the river, as defined by the U.S. Bureau of Reclamation (Reclamation) in their January 2012 *Yankee Fork Tributary Assessment*. Reach YF-2 is described as extending between RM 3 and RM 6.9 in a confined valley segment that is artificially constrained by extensive piles of dredge tailings placed during gold dredging activities in the 1940s and 1950s (Reclamation 2012d). The channel type in this reach is described by Reclamation as a plane-bed, free-formed alluvial channel with a straight channel pattern, a 0.6% slope, and a substrate dominated by cobbles. Channel width in the vicinity of the site is approximately 65 to 70 feet.

The banks of Yankee Fork in the analysis area and vicinity are steep and typically composed of boulders and large cobbles, with limited vegetation in many areas due to the lack of soil development. Riparian vegetation present in the southern portion of the Yankee Fork site where the proposed facility would be located is limited to a narrow strip between the channel and Yankee Fork Road. Species present include small lodgepole pine (*Pinus contorta*), willows (*Salix* spp.), mountain alder, and various grasses and forbs. The northern portion of the site extends into an area occupied by some of the dredge tailing piles left over from historic gold mining activities. Vegetation in this area is similar to that in the southern portion of the site but much sparser, with scattered shrubs and trees primarily located around the base of the tailings piles and along the stream channel.

#### Floodplains

Flood hazards in Custer County were identified by FEMA in the March 4, 1988, *Flood Insurance Study for Custer County, Idaho and Incorporated Areas* and associated FIRMs. According to the FIRM map index produced from this study, the Yankee Fork site is located on Community Panel No. 16037C0550C, which is designated as "Panel not Printed – Area in Zone D" (FEMA 1988). Zone D is defined by FEMA as unstudied areas where flood hazards are undetermined, but flooding is possible; no mandatory flood insurance purchase requirements apply to such area, but coverage under the National Flood Insurance Program is available to participating communities (FEMA 2011: 31).

Although there are no FEMA-mapped floodplains on the Yankee Fork site, the 100-year floodplain was determined for the middle and lower Yankee Fork by Reclamation during a 2012 tributary assessment using 1-meter LiDAR data modeling at the geomorphic reach level (Figure 3.6-2). Based on this assessment, Reclamation determined that the historic floodplain along much of Yankee Fork is disconnected from the channel by dredge tailings (Reclamation 2012d: 5). As such, the current floodplain is largely confined to the channel. The present channel is similar to the pre-dredging condition, when the channel was moderately confined by higher surfaces, alluvial fans, and bedrock into a relatively straight, free-formed alluvial channel.

### 3.6.1.3 Panther Creek Weir Facility

#### Wetlands and Non-Wetland Other Waters

Wetlands and non-wetland other waters on the Panther Creek site were delineated in the field on July 5, 2013, with the results summarized in a February 19, 2014, report entitled *Crystal Springs Hatchery – Yankee Fork River and Panther Creek: Wetland and Stream Delineation Report* (McMillen, LLC 2014). During this study, two wetlands (Wetland Panther-A and Wetland Panther-B) and two non-wetland other waters (Panther Creek and Dummy Creek) were identified on the site. The ordinary high water mark of Panther Creek was also mapped during this delineation. Each of these wetlands and a segment of Panther Creek are briefly discussed in the following sections.

### Wetland Panther-A

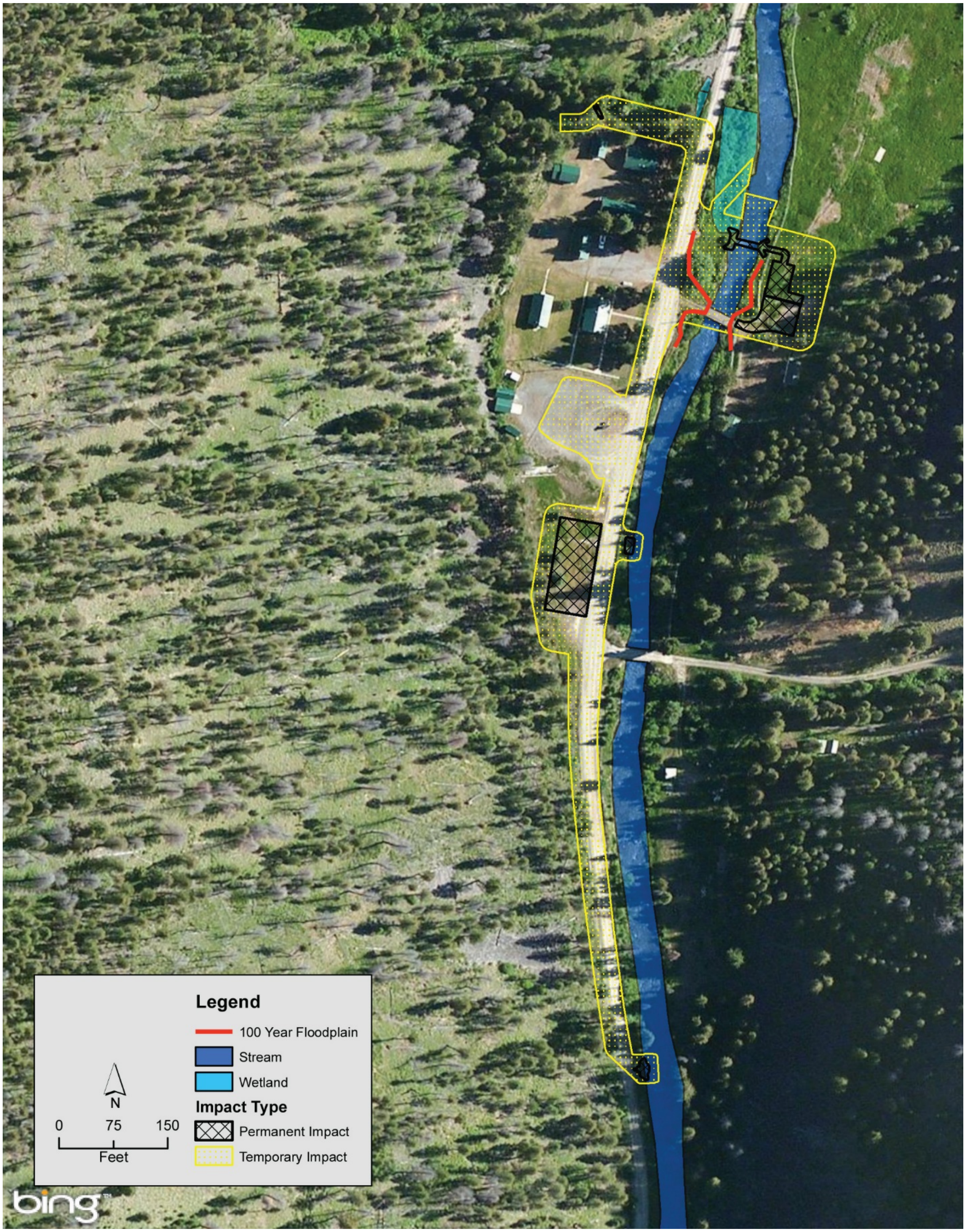
Wetland Panther-A is located in the northern portion of the Panther Creek site, in a roadside ditch on the west side of Panther Creek Road (National Forest Road 55) (Figure 3.6-3). It is classified as a palustrine, unconsolidated bottom wetland under the USFWS system (Cowardin et al. 1979: 27–28) and a depressional wetland under the HGM system (Smith et al. 1995: 12–13). Wetland Panther-A is approximately 0.02 acre in size and was delineated using the edge of standing water that was present during the 2013 delineation fieldwork (McMillen, LLC 2013d).

Wetland Panther-A is mostly unvegetated, with some common horsetail (*Equisetum arvense*) growing around the edges and in the middle of the delineated wetland. Watercress is also present. Substrate primarily consists of riprap and gravel. Underlying soils could not be classified because the investigators could not dig through this material (McMillen, LLC 2013d: 12).

Wetland Panther-A is fed by seepage from the adjacent hillslope and by runoff from Panther Creek Road. It currently lacks an outlet but seems to have once flowed toward the north into Dummy Creek, which is conveyed under Panther Creek Road by a corrugated metal pipe culvert that drains into Panther Creek (Figure 3.6-3). The 2008 USFS *Middle Panther Creek Watershed Analysis* mentions that the current channel alignment of Dummy Creek with this culvert includes a sharp bend near the culvert invert that frequently causes increased bedload deposition in this area (USFS 2008: 15). Such deposition likely blocked the connection between Dummy Creek and Wetland Panther-A at some point in the past. At the time of the 2013 site visit, Wetland Panther-A contained approximately 8 inches of standing water (McMillen, LLC 2013d: 12). Its hydrologic regime is likely seasonally inundated/saturated to permanently flooded.

According to the MWAM results, Wetland Panther-A does not have the ability to perform any of the assessed functions at a high level. Functions that received moderate ratings included sediment/nutrient/toxicant removal and groundwater discharge/recharge. Functions that received low ratings included provision of habitat for ESA-listed species, provision of habitat for Idaho Natural Heritage Program species, provision of general wildlife habitat, short- and long-term surface water storage, production export/food chain support, and wetland uniqueness. Wetland Panther-A does not currently provide general fish habitat, flood attenuation, sediment/shoreline stabilization, or recreation/education opportunities. Wetland Panther-A was categorized as a Category IV Wetland due to the abundance of roadside ditch wetlands in the watershed, its small size, and its limited ability to perform many wetland functions.

**Figure 3.6-3. Existing Floodplains and Surface Waters, and Permanent and Temporary Impacts at the Panther Creek Weir Facility**



### Wetland Panther-B

Wetland Panther-B is located in the northern portion of the Panther Creek site, on a riparian bench between the Panther Creek channel and Panther Creek Road (Figure 3.6-3). It is approximately 0.16 acre in size and sits directly adjacent to the stream channel. Wetland Panther-B is classified as a palustrine, emergent wetland under the USFWS system (Cowardin et al. 1979: 35–36) and a slope wetland under the HGM system (Smith et al. 1995: 13, 16). Its boundary was delineated based on a mild topographic break, changes in the prevalence of upland and hydrophytic vegetation, and the presence of wetland hydrologic indicators (e.g., heavily saturated soils and/or redoximorphic features in the upper 12 inches of the soil column) (McMillen, LLC 2013d: 13).

Wetland Panther-B is underlain by silt. Dominant vegetation includes Nebraska sedge, with Woods' rose and salmonberry (*Rubus spectabilis*) shrubs present around its edges. Some tall buttercup is also present.

Hydrology for Wetland Panther-B is supplied by hillside seepage through the Panther Creek Road embankment. Other potential sources include a shallow water table and stormwater runoff from the adjacent roadway. Portions of this wetland could also be inundated by overbank flooding from Panther Creek, although this is not known to occur very frequently at this site (Stone pers. comm. 2015e). The hydrologic regime of Wetland Panther-B is seasonally to permanently saturated.

The functional capacity of Wetland Panther-B was assessed using MWAM. Because of its location in the riparian zone directly adjacent to Panther Creek, a portion of the stream channel was included in the assessment area per MWAM procedural guidelines. Assessment results indicate that this wetland and adjacent stream channel have the capacity to perform several functions at a high level, including the provision of primary habitat for both ESA-listed and other special status fish species, the retention of sediments/nutrients/toxicants, and the stabilization of sediments/shorelines. Functions that received moderate ratings for this wetland included general wildlife and habitat provision, flood attenuation, production export/food chain support, groundwater discharge/recharge, and uniqueness. Functions that received low ratings were limited to short- and long-term surface water storage. This wetland does not currently provide recreation/education provision functions. Wetland Panther-B was classified as a Category I wetland due to its location directly adjacent to a stream that provides documented primary habitat for ESA-listed species.

### Non-Wetland Other Waters

Non-wetland other waters at the proposed Panther Creek site include Panther Creek and Dummy Creek (Figure 3.6-3). Panther Creek is a perennial stream that originates near Morgan Creek Summit at an elevation of approximately 8,000 feet and flows in a north-northwesterly direction for about 44 miles before entering the Salmon River near Shoup, Idaho (Shoshone-Bannock Tribes 2011: 12). It is the largest tributary in the Middle Salmon-Panther subbasin with a drainage area of approximately 1,800 square miles (USFS 2008: 1). Average annual flow is around 258 cfs, with a high flow of up to 3,000 cfs occurring every 10 years (Shoshone-Bannock Tribes 2011: 15). Flow in Panther Creek is primarily driven by snowmelt, with peak flows occurring in May or June and the lowest flows during the fall and winter months.

The proposed Panther Creek site is located near RM 3.1 and extends along both banks of Panther Creek near the USFS's Cobalt Work Center. Channel width in this location varies from 10 to 50 feet, with the substrate primarily composed of cobble, with some boulders. Two bridges are present over

Panther Creek in this location. The south (upstream) bridge provides access to National Forest Road 099. The north (downstream) bridge provides access to a couple of small outbuildings and fenced pasture used for pack animals. The riparian zone along the west (left) banks of Panther Creek in this area varies from between 10 to 50 feet in width and is constrained by Panther Creek Road to the west. Similar conditions are present on the east (right) bank where a less-travelled gravel access road extends along the channel. Vegetation in these areas is dominated by shrubs including various willows, Woods' rose, salmonberry, snowberry (*Symphoricarpos albus*), and black cottonwood (Populus *balsamifera* L. ssp. *trichocarpa*). A relatively dense layer of herbs and forbs are also present.

Dummy Creek is a small perennial stream that flows into Panther Creek from the west (Figure 3.6-3). It enters Panther Creek just downstream (north) of the USFS's Cobalt Work Center through a culvert located underneath Panther Creek Road. Dummy Creek drains approximately 838 acres used for timber harvest and dispersed recreational activities, a significant portion of which was burned in the Clear Creek Fire of 2000 (USFS 2008: 15). It is also thought to receive groundwater discharge from springs. The Dummy Creek channel is approximately 4 to 6-feet wide with a gravel and cobble substrate. It includes an existing instream diversion used to supply water to the adjacent USFS administrative facility. According to the USFS, flow in the creek is estimated to be approximately 1 cfs in the summer months (Deschaine pers. comm.).

## Floodplains

Flood hazards in Lemhi County were identified by FEMA in the August 15, 1990, *Flood Insurance Study for Lemhi County Unincorporated Areas*. Based on the map index FIRM produced from this study, the Panther Creek site is located on Community Panel No. 1600920650A, which is designated as "Panel not Printed – Area in Zone D" (FEMA 1990). As previously described, Zone D is used by FEMA to identify unstudied areas where flood hazards have not been determined but flooding is possible (FEMA 2011: 31). Like the Yankee Fork, large portions of Panther Creek have been cut off from the floodplain by past activities, namely the construction of Panther Creek Road, which encroaches into the floodplain, and in some cases the active channel, in several locations (USFS 2008: 20).

Lacking a FEMA-mapped floodplain, the approximation of the 100-year floodplain mapped on construction drawings was used for this analysis (Figure 3.6-3). This floodplain boundary is only mapped for the portion of the site north of the National Forest Road 099 (upstream) bridge; it does not extend to the south to the proposed location of the future inlet structure. On the west side of Panther Creek, this boundary generally corresponds with the top of the stream bank for the area between the two bridges. North of the downstream bridge, it extends farther inland to the toe of the Panther Creek Road embankment where it encompasses the riparian bench that includes Wetland Panther-B. On the east side of the creek, in the area between the bridges, the mapped floodplain extends approximately 50 feet inland to the toe of the adjacent road embankment. North of the downstream bridge, the boundary extends over 125 feet inland to include much of the fenced pasture in this location.

For the most part, the narrow riparian areas present within the approximated floodplain on the west side of Panther Creek are vegetated with native shrubs and herbaceous vegetation including willow, salmonberry, Wood's rose, red-osier dogwood, smooth brome (*Bromus inermis*), Idaho bentgrass (*Agrostis idahoensis*), Nebraska sedge, and scouring rush (*Equisetum hyemale*). Similar species are present on the east side of the creek where wooden fencing has been installed in several locations along the channel to deter livestock and people from accessing the stream bank. The pasture area is dominated by grasses with shrubs around its edges.

# 3.6.2 Environmental Consequences

Construction and operation of the proposed Hatchery Program would cause direct, indirect, and cumulative impacts on wetlands and floodplains.

Potential impacts on wetlands and floodplains from the Hatchery Program were also considered in regard to their duration. Permanent impacts are those that would modify a wetland or floodplain to such a degree that it would not return to its preconstruction state for the life of the Hatchery Program. Temporary impacts are those that would result in the short-term disturbance of these resources but would not prevent the re-establishment of similar preconstruction conditions in the affected wetland or floodplain.

Construction impacts on wetlands and floodplains were determined for each of the sites by overlaying the proposed facility footprints onto a basemap that included the delineated boundaries of wetlands, other waters, and the 100-year floodplains mapped by FEMA and Reclamation. Wetlands and floodplains that fell within the footprint were considered to be either temporarily or permanently impacted by the Hatchery Program depending upon the proposed activity. Impacts from proposed facility operations were identified by examining how routine operational procedures could affect wetlands and floodplains located both on and off the site. Such impacts were qualitatively described, including the impact mechanism, potential effects, duration (i.e., temporary or permanent), and likelihood of occurrence in light of the proposed mitigation measures.

## 3.6.2.1 Alternative 1: Hatchery Program with Permanent Weirs

### Crystal Springs Hatchery Site

Because the Crystal Springs hatchery site would be built under all action alternatives, these impacts would be the same for both Alternative 1 and Alternative 2.

#### Construction

***Wetlands***

Construction of the Crystal Springs hatchery would require the excavation and placement of fill material (e.g., gravel, concrete, riprap) into approximately 85 square feet (0.002 acre) of Wetland Crystal-A to construct the hatchery outfall structure (Figure 3.6-1). The permanent loss of this area from the 1.12 acre wetland would be small (<0.2% of the wetland area) and would not affect the functions and values that are currently being provided by Wetland Crystal-A (see Section 3.6.1.1, *Crystal Springs Hatchery Site*). No other wetland or other waters would be excavated or filled during construction of the proposed hatchery facility.

During construction, erosion and sediment-laden runoff from exposed soils in construction areas could discharge to Wetland Crystal-A and subsequently flow into the unnamed side channel and McTucker Creek. McTucker Creek is listed on the Clean Water Act Section 303(d) list for sediment (IDEQ et al. 2012: 31). Additional sediments entering this stream could result in further degradation of this water by increasing turbidity, thereby affecting water quality and potential beneficial use of this stream by cold water aquatic life and recreational use (e.g., fishing). Leaks and spills of chemicals used during construction, such as oil, diesel fuel, hydraulic fluid, paint, and concrete, could also be carried into nearby wetlands and waterways by stormwater runoff, adversely affecting water quality and aquatic life in both these and other downstream waters. For additional information on the potential construction impacts on water quality impacts and fish, see Section 3.5, *Groundwater and Surface Water Quality and Quantity,* and Section 3.7, *Fish*.

During construction, fugitive dust could be generated from equipment and wind moving over areas of disturbed soils and adjacent gravel roads (e.g., River Road). Accumulation of this dust on wetland vegetation could affect plant growth by inhibiting photosynthesis, which could result in reduced vegetation density and plant diversity. In turn, this could reduce the wetland's ability to perform certain functions such as general wildlife habitat, and production export/food chain support. Implementation of standard construction best management practices (BMP) to control fugitive dust (e.g., watering haul roads/disturbed areas) would reduce the potential of this impact. In consideration of the very small area of direct wetland impact and the measures taken to prevent construction impacts on other wetlands in the area, overall **low** impacts would be expected.

Impacts on a small percentage of wetlands that would be permanently filled during construction would be **low**. During construction, impacts on wetlands from erosion, sediment, and dust are unlikely to affect wetland plant growth and water quality due to implementation of erosion control measures, thereby limiting impacts on wetlands in the area to a **low** level.

#### *Floodplains*

Because floodplains are not present at the Crystal Springs hatchery site, construction of Alternatives 1 and 2 would have **no** impact on any floodplains on the Crystal Springs hatchery site or on adjacent properties.

### Operation

#### *Wetlands*

Potential wetland impacts associated with operation of the proposed hatchery facility could include induced changes in the hydrologic regime and functions of Wetland Crystal-A from the modification of surface drainage patterns by facility structures (e.g., stormwater collection system). Once the facility is operational, stormwater runoff from the western portion of the site that may have once reached the wetland would be intercepted, collected, and treated, then returned to the lower pond through the facility's outfall, along with treated effluent from the hatchery. Because surface water runoff does not seem to be a major hydrologic source for this wetland (McMillen, LLC 2013d: 5), these changes in surface drainage patterns are expected to have a **low** impact on the hydrology and functions of Wetland Crystal-A.

The pumping of groundwater for fish hatchery operations and domestic water supply for hatchery residences could affect the hydrology available for Wetland Crystal-A and the functions it provides. As detailed in the water quantity analysis (Section 3.5, *Groundwater and Surface Water Quality and Quantity*), there is low potential for such an impact and, if the impact were to occur, hatchery staff would place stoplogs between the existing ponds to maintain water levels in those areas. With this design provision, hatchery operations have negligible potential to alter the hydrology of Wetland Crystal-A, and operations would result in a **low to no** impact on wetlands at the site.

#### *Floodplains*

Because floodplains are not present at the Crystal Springs hatchery site, operation of Alternatives 1 and 2 would have no impacts on any floodplains on the Crystal Springs hatchery site or on adjacent properties.

## Yankee Fork Weir Facility

### Construction

#### *Wetlands*

Construction of the Yankee Fork weir facility would not require the excavation or placement of fill material directly into wetlands; however, it would include the construction of a stormwater outlet structure along the edge of Wetland Yankee-A (Figure 3.6-2). Construction of this structure would require the removal of some herbaceous and scrub-shrub vegetation along the perimeter of this wetland.

Alternative 1 would require both temporary and permanent modifications to the Yankee Fork channel. Temporary impacts would include:

- Excavation of two portions of the west bank below the ordinary high water mark to construct the temporary bypass channel. This would affect 0.14 acres, of which 0.06 acres would be riparian vegetation, 0.01 acres would be upland shrub vegetation, and the remainder would be unvegetated stream channel and gravel bar.
- Placement of sand or soil bag coffer dams to isolate and dewater the Yankee Fork channel in the area of weir construction and in the vicinity of the inlet structure. This would affect 0.21 acres of stream channel and 0.05 acres of riparian vegetation.

Once construction of the bridge-supported weir was completed, the coffer dam would be removed and the bypass channel would be filled in with the soil that was removed; the area would be replanted with native vegetation. Similarly, the coffer dam placed during inlet structure construction would be removed following construction, and the work area replanted with native vegetation.

Permanent modifications to the river channel would include the excavation of the streambed to install the pre-cast concrete sill and abutments for the bridge-supported weir. These features would disturb the natural substrate of the stream bed and bank. A total of 0.01 acres of the stream channel would be permanently affected. The weir structure would also permanently affect a small area (less than 0.01 acre) of riparian and developed cover on the banks at each end of the weir. In addition, less than 0.01 acre of the east stream bank in the northern portion of the site would be excavated and replaced with concrete, steel, and rock to construct the proposed inlet structure. Given the relatively small size of these areas and the lack of wetlands in these locations, these activities would cause temporary **low** impacts on the stream system and downstream waters, but long-term would have **no** impact on wetland functions.

Overall, these actions would cause minor and temporary impacts on the stream system or to downstream waters.

Both Yankee Fork and Wetlands Yankee-A and Yankee-B could be adversely affected by sediment-laden runoff and fugitive dust during the construction phase of Alternative 1 (see the construction impact discussion for the Crystal Springs hatchery site presented above). Implementation of standard construction erosion control and dust management BMPs would reduce the potential of such impacts. In consideration of the need to temporarily reroute the stream and temporarily clear vegetation in the wetland buffer, facility construction would have a **moderate** but temporary impact on wetlands at the site. Due to the small area affected and the use of remediation measures, permanent construction impacts on wetlands would be **low**.

#### *Floodplains*

The proposed temporary bypass channel, portions of the bridge-supported weir abutments, and the intake structure would be located within the 100-year floodplain of Yankee Fork. Construction of these features would require the excavation of native material from these areas and the placement of rock backfill, concrete, and other materials (e.g., plastic liner). Material removed from the excavation of the bypass channel would be temporarily stockpiled in the floodplain. This would occur during the summer, when flood risks are minimal. Following construction, the diversion channel would be re-filled with this material and revegetated with native plants. The other features would remain as permanent structures in the floodplain, resulting in a total floodplain impact of 668 square feet (0.015 acres). These temporary and permanent impacts would not result in significant changes to floodplain capacity nor would they alter flood flows. With implementation of the mitigation measures described in Section 3.6.3, *Mitigation*, impacts on the Yankee Fork floodplain from Alternative 1 would be low. Due to the low risk of flooding during construction and the minimal area of permanent structures in the floodplain relative to the size of the floodplain, impacts would be **low**.

### Operation

#### *Wetlands*

Stormwater runoff from the Yankee Fork weir facility and the realigned section of Yankee Fork Road would be routed into roadside ditches. These ditches would drain into a series of catch basins that would convey flow into Wetland Yankee-A. This conveyance system could introduce sediments and other pollutants (e.g., leaked vehicle fluids) into the wetland, and possibly into the Yankee Fork, through stormwater runoff from paved and graveled areas. Such pollutants could degrade water quality in these resources and damage the aquatic organisms using them. Because the ditches that would receive this runoff would be vegetated, there is the potential for some pollutants (especially sediment) to be filtered out, resulting in **low** impacts on the wetland. Fuel or other chemical spills in these areas could cause more serious impacts on the wetland and receiving waters. These impacts would be minimized to a **low** impact by the recommended mitigation measures listed in Section 3.6.3, *Mitigation*, for the Yankee Fork weir facility. Due to the use of mitigation measures minimizing the risk of introducing contaminants to wetlands, operational impacts on wetlands would be **low**.

#### *Floodplains*

Operation of the bridge-supported weir would not be expected to adversely affect the 100-year floodplain of the Yankee Fork. The permanent structures in the floodplain (bridge-supported weir abutments, intake structure) would likely not obstruct the floodway or cause a rise in the 100-year flood elevation. Although the proposed weir panels would extend below the 100-year flood elevation when deployed, they could be rotated out of the river channel during high flows and are designed to be approximately 2 feet above the 100-year flood elevation in the up position (Reiser pers. comm. 2015c). Because the weir panels would not obstruct the floodway or elevate the 100-year flood elevation, there would be **no to low** impacts on floodplains.

## Panther Creek Weir Facility

### Construction

#### *Wetlands*

As currently proposed, construction of the permanent Panther Creek weir facility would require both temporary and permanent impacts on Panther Creek and Wetland Panther-B, and permanent impacts on Dummy Creek (Figure 3.6-3).

Temporary impacts on the Panther Creek channel total 0.16 acres, and would include the excavation of the west stream bank below the ordinary high water mark to construct the entrance and exit of the temporary diversion channel; placement of soil bag coffer dams to isolate 0.10 acre of the channel in four locations to provide work areas for the bridge-supported weir/fish ladder, acclimation pond outfall, and upstream intake structure; and excavation within the existing streambed to install the water supply lines for the fish ladder/adult holding ponds/spawning and egg preparation structure. Temporary impacts on Wetland Panther-B would include the clearing of vegetation and excavation of approximately 10 square feet of Wetland Panther-B to create the diversion channel.

Permanent modifications to the Panther Creek channel would include the excavation of the streambed and both banks to install the pre-cast concrete sill, bridge-supported weir abutments, fish ladder entrance, acclimation pond outfall, and the water supply inlet structure. These features would require the removal of riparian vegetation and the disturbance of the natural substrate of the channel. As part of this work, less than 0.01 acre of the cobble, gravel, sand, and mud would be removed from the channel and replaced with pre-cast concrete structures and riprap. Approximately 10 square feet of Wetland Panther-B would also be permanently impacted by the installation of the left (west) bank abutment. Once construction of these features has been completed, the coffer dams would be removed and the diversion channel would be filled in with the soil that was previously excavated from this area. Wetland Panther-B would also be restored to its preconstruction contours and replanted with native wetland vegetation.

Permanent impacts on Dummy Creek would include the excavation of 76 square feet (0.0017 acre) of the bed and banks to install the proposed pre-cast diversion structure. Construction of this structure would be done during the dry season and would not require temporary diversion of stream flow.

Overall, these actions are not expected to cause any substantial functional impacts on Panther Creek, Dummy Creek, or to other downstream wetlands and waters. In-channel work could cause a temporary increase in turbidity but this would be minimized by the recommended mitigation measures listed in Section 3.6.3, *Mitigation*, for the Panther Creek weir facility. The excavation of Wetland Panther-B for diversion channel construction and placement of the left-bank bridge abutment would impact a Category I wetland and temporarily suspend most of the functions that it currently provides, including sediment/nutrient/toxicant retention, shoreline stabilization, fish and wildlife habitat provision, flood attenuation, and production export/food chain support. Most of these functions would re-establish once this wetland is restored and replanted. Because it would be restored in the same location adjacent to the stream channel, Wetland Panther-A would continue to provide habitat for ESA-listed fish species and would retain its Category I rating after it is re-established.

In addition to these activities, sediment-laden or contaminated runoff, fugitive dust from construction vehicles, and soil disturbing activities could impact Panther Creek, Dummy Creek, and Wetlands Panther-A and Panther-B (see the construction impact discussion for the Crystal Springs hatchery site presented above). Implementation of standard construction erosion control and dust management BMPs would reduce the potential for such impacts. In consideration of the need to reroute the stream, facility construction would have a **moderate** but temporary impact on wetlands at the site. Due to the small area affected and the use of mitigation measures, permanent construction impacts on wetlands would be **low**.

#### *Floodplains*

The proposed temporary bypass channel, bridge-supported weir abutments, fish ladder, adult holding area, and a portion of the intake and discharge structures would all be located within the 100-year floodplain of Panther Creek. Construction of these features would require the excavation of native material from these areas and the placement of rock backfill, concrete, riprap, and other materials (e.g., plastic liner). Material removed from the excavation of the bypass channel might need to be temporarily stockpiled in the floodplain. This would occur during the summer, when flood risks are minimal. Following construction, the diversion channel would be re-filled with this material and revegetated with native plants. The other features would remain as permanent structures, occupying approximately 0.31 acres within the 100-year floodplain. These impacts would likely not result in significant changes to floodplain capacity nor would they alter flood flows. Therefore, impacts from construction work within floodplains under Alternative 1 would be **low**.

### Operation

#### *Wetlands*

No mechanism has been identified whereby operation of the proposed Panther Creek weir facility could have any impacts on the wetlands and non-wetland other waters at the site. Therefore, there would be **no** operational impacts on wetlands.

#### *Floodplains*

Operation of the bridge-supported weir is not expected to adversely affect the 100-year floodplain of Panther Creek. The permanent structures in the floodplain (bridge-supported weir abutments, fish ladder/adult holding ponds/spawning and egg preparation structure, intake structure, and acclimation pond outfall) would likely not obstruct the floodway or cause a rise in the 100-year flood elevation. Although the proposed weir panels would extend below the 100-year flood elevation when deployed, they could be rotated out of the river channel during high flows and are designed to be approximately 2 feet above the 100-year flood elevation in the up position (Reiser pers. comm. 2015c). Due to the minimal area of permanent structures in the floodplain, and ability to retract weir structures to depths above the 100-year flood, floodplain impacts would be **low.**

## 50% Production of Chinook Salmon Option

Water quality impacts associated with the 50% production of Chinook salmon option are analyzed in Section 3.5, *Groundwater and Surface Water Quality and Quantity*.

### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, Alternatives, Including the Proposed Action, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, impacts on wetlands and floodplains associated with construction of the hatchery facilities would be the same as Alternative 1. Project design measures would minimize wetland fill (0.002 acre), and best management practices would be implemented to minimize potential impacts on water quality in wetlands. These impacts would be **low**. (The site has no floodplains.)

Although production of Chinook salmon would be reduced by 50%, the operational impacts on wetlands and floodplains would be nearly the same as that described for full production under Alternative 1. Operations associated with this reduced production option would include groundwater pumping; however, impacts to onsite wetlands from pumping groundwater would be negligible, resulting in **low** impacts on wetlands. (Floodplains are not present at the site.)

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, impacts on wetlands and floodplains associated with construction of the weir facilities would be the same as full production. Rerouting the stream channel during construction would have a **moderate** but temporary impact on wetlands at the sites. Implementing standard construction erosion control and dust management BMPs would reduce potential water quality impacts on wetlands, resulting in a **low** impact. Placement of the permanent weir structures in the floodplain would have a **low** impact on flood flows.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Operating the weir panels at the Yankee Fork and Panther Creek weir facilities would not affect the floodplain, resulting in a **low** impact.

### 3.6.2.2 Alternative 2: Hatchery Program with Temporary Weirs

#### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts on wetlands and floodplains at the Crystal Springs hatchery would be the same as described under Alternative 1.

#### Yankee Fork Weir Facility

**Construction**

***Wetlands***

Under Alternative 2, no permanent or temporary impacts on wetlands would occur at the Yankee Fork site. Installation and removal of the temporary picket weir and fish trap would involve the placement of metal components in the channel of the Yankee Fork for approximately three to four months during the summer and early fall but would not require the excavation or placement of any fill material into wetlands or other waters of the United States. Stormwater would not be routed into Wetland Yankee-A under this alternative. Under Alternative 2, there would be **no** impact on wetlands.

***Floodplains***

Under Alternative 2, no structures, equipment, or fill material would be placed in the 100-year floodplain would occur at the Yankee Fork site, resulting in **no** impact on floodplains.

**Operation**

***Wetlands***

Operation of the temporary weir and trapping facility would have **no** impact on wetlands. Wetlands Yankee-A and Yankee-B are not within the work area and would not be affected by weir installation, fish trapping, or weir removal activities.

***Floodplains***

Operation of the temporary weir and trapping facility would have **no** impact on floodplains. Operation activities are limited to the east bank of the stream, which is not within the 100-year floodplain of the Yankee Fork.

#### Panther Creek Weir Facility

**Construction**

***Wetlands***

Under Alternative 2, a temporary weir would be installed at the Panther Creek site. Since no surface disturbance would occur and no facilities would be placed into wetlands, construction impacts on surface waters or wetlands would be **low**.

#### *Floodplains*

Seasonal installation and removal of the temporary weir and trapping facility would have **no** impact on floodplains. Operation activities are limited to the west bank of the stream, in areas that are outside of the 100-year floodplain of Panther Creek.

### Operation

#### *Wetlands*

Operation of the Panther Creek weir facility under Alternative 2 would include the annual installation and removal of the temporary picket weir and fish trap in the Panther Creek channel. These activities would not require the excavation or placement of any fill material into wetlands. There would be **no** operational impacts on wetlands.

#### *Floodplains*

Operation of the temporary weir and trapping facility would have **no** impact on floodplains. Operation activities are limited to the left (west) bank of the stream, in areas that are outside of the 100-year floodplain of Panther Creek.

## 50% Production of Chinook Salmon Option

Water quality impacts associated with the 50% production of Chinook salmon option are analyzed in Section 3.5, *Groundwater and Surface Water Quality and Quantity*.

### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand. No facilities would be placed into wetlands, and no facilities would be placed in the 100-year floodplain at either site. As a result, there would be **no** construction-related impacts on wetlands and floodplains impacts.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Operations would not affect wetlands because the weir facilities would not be placed in any wetlands at either site, resulting in **no** impact on wetlands. In addition, seasonal installation and removal of the temporary weir facilities would have **no** impact on floodplains because facility operations would occur outside the 100-year floodplain of both Yankee Fork and Panther Creek. These impacts would be **low**.

## 3.6.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on wetlands and floodplains during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.6.3.1 Alternative 1

#### Construction

##### Crystal Springs Hatchery Site

The following measures would be implemented at the Crystal Springs hatchery to minimize impacts on wetlands and floodplains.

- Review water quality mitigation measures, required BMPs, and permit requirements with construction contractors and inspectors during a preconstruction meeting covering environmental requirements.
- Implement an erosion control and sedimentation plan, which would include sedimentation and erosion control measures, such as silt fences, straw bales, and jute matting to prevent sediment from entering waterways and wetland habitats.
- Implement a fugitive dust control plan including the use of water trucks or other appropriate methods to control dust during construction, the use of gravel on access road surfaces in areas of sustained wind to reduce potential dust erosion, and the establishment of a 15-mile-per-hour speed limit for construction vehicle use on unpaved roads and surfaces.
- Install signage, fences, and flagging to restrict work areas and confine vehicles and equipment to designated routes that avoid wetlands and waterways.
- When working next to wetlands and waterways, limit disturbance to the minimum necessary to achieve construction objectives, minimize habitat alteration, and limit the effects of erosion and sedimentation.
- Implement a Spill Prevention, Control, and Countermeasures (SPCC) plan in accordance with federal, state, and local requirements. At a minimum, the SPCC should address fuel and chemical storage, spill containment and cleanup, construction contractor training, and proper spilled material disposal activities.
- Store, fuel, and maintain vehicles and equipment in designated vehicle staging areas located a minimum of 300 feet from any wetlands, streams, or other water bodies.
- Inspect machinery regularly for leaks.
- Revegetate temporarily disturbed areas with appropriate native species.
- Develop and implement a work area isolation/dewatering plan for instream work that includes provisions for erosion and sediment control.

- Check all equipment for leaks, and, prior to entering wetlands, waterways, or floodplains, and completely clean off any external petroleum products, hydraulic fluid, coolants, and other pollutants.
- Re-grade disturbed areas to pre-construction contours and revegetate with appropriate native species.

#### Yankee Fork Weir Facility

Implement the same mitigation measures recommended for construction of the Crystal Springs hatchery under Alternative 1.

#### Panther Creek Weir Facility

Implement the same mitigation measures recommended for construction of the Crystal Springs hatchery under Alternative 1. In addition, stockpile wetland soils removed from Wetland Panther-A at the Panther Creek weir facility during diversion channel construction and use them to re-fill the channel once construction is completed.

### Operations

No mitigation would be recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1.

## 3.6.3.2 Alternative 2

### Construction

#### Crystal Springs Hatchery Site

The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation would be recommended.

### Operations

No mitigation is recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 2.

# 3.6.4 No Action Alternative

Under the No Action Alternative, the Crystal Springs hatchery, Yankee Fork, and Panther Creek weir facilities would not be constructed. Existing conditions would continue, and no impacts on wetlands or floodplains would occur on the site related to construction or operations of the Hatchery Program. As a result, **no** impacts on wetlands or floodplains would result from the No Action Alternative.

# 3.7 Fish

This section describes the affected environment and environmental consequences, including mitigation measures, associated with fish resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level (up to 1 million smolts) and a 50% production level. This section also summarizes the federal Wild and Scenic Rivers Analysis presented in Appendix D for the fish outstandingly remarkable value (ORV), which is considered in the affected environment and the environmental consequences analysis of fish for both Yankee Fork and Panther Creek.

## 3.7.1 Affected Environment

The analysis area for fish includes areas in the Salmon River and Upper Snake River subbasins in Idaho where proposed facilities would be constructed, where hatchery-reared spring Chinook salmon juveniles and Yellowstone cutthroat trout would be released, and where the proposed Crystal Springs hatchery-reared spring/summer-run Chinook salmon may return to spawn.

### 3.7.1.1 Crystal Springs Hatchery Site

Water would be supplied to the proposed Crystal Springs hatchery by groundwater wells. Supply-side water affects no water bodies and, thus, water supply would not affect any fish species (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*). Shoshone-Bannock Tribal biologists used electrofishing to test for fish presence in the former rearing ponds on the hatchery site property. No fish of any species were collected in the ponds within the property boundary (Stone pers. comm. 2015f).

Hatchery effluent would be conveyed from the facility through a 36-inch culvert under River Road into McTucker Creek, which flows onward approximately 3.5 miles to its mouth at American Falls Reservoir. The 50,000-acre American Falls Reservoir is created by American Falls Dam on the Snake River and is known to support populations of brown trout (*Salmo trutta*), common carp (*Cyprinus carpio*), largemouth bass (*Micropterus salmoides*), rainbow trout (*Oncorhynchus mykiss*), redside shiner (*Richardsonius balteatus)*, sculpin (various species), smallmouth bass (*Micropterus dolomieu*), Utah chub (*Gila atraria*), yellow perch (*Perca flavescens*), and Yellowstone cutthroat trout (*Oncorhynchus clarkii*) (IDFG 2015e).

McTucker Creek is approximately 5 miles long overall with a watershed of less than 500 acres. Depending on the stage of the American Falls Reservoir, the creek can be up to 30 feet wide near the proposed hatchery. The upper reaches of McTucker Creek have a clearly defined bed and bank, but near the Crystal Springs hatchery the channel form changes to a network of multiple intermittent channels flowing through a series of marshy areas adjacent to the reservoir. Because of its proximity to the Snake River and American Falls Reservoir, McTucker Creek may provide habitat for fish species found in American Falls Reservoir, including brown trout, common carp, largemouth bass, rainbow trout, redside shiner, sculpin (various species), smallmouth bass, Utah chub, yellow perch, and Yellowstone cutthroat trout (IDFG 2015e). However, due to its small size, it likely does not support robust populations of fish. Some local landowners have spoken of trout being caught in the creek near the outfall from the hatchery (Stone pers. comm. 2015f) but no fish sampling efforts have been recorded.

Yellowstone cutthroat trout is the only special status fish species that may occur in the vicinity of the Crystal Springs hatchery; it is identified as "imperiled" on the Idaho Department of Fish and Game's (IDFG) Species of Greatest Conservation Need list (IDFG 2005). This species has rearing and migration habitat in American Falls Reservoir, and may have spawning, rearing, and migration habitat in McTucker Creek. No federally listed fish species occur above the American Falls Reservoir dam.

#### 3.7.1.2 Yankee Fork Weir Facility

The Yankee Fork and its tributaries are known to support at least six fish species: Chinook salmon (*Oncorhynchus tshawytscha*), rainbow trout/steelhead, bull trout (*Salvelinus confluentus*), westslope cutthroat trout (*O. clarkii lewisi*), mountain whitefish (*Prosopium williamsoni*), and sculpin (presumably shorthead sculpin [*Cottus confuses*] and mottled sculpin [*Cottus bairdi*]) (Gamett and Bartel 2008; USFS 2006; USFS 2013a). Observations by Gamett and Bartel (2008) indicate that Chinook salmon and whitefish are typically constrained to the larger sections of the mainstem Yankee Fork. Rainbow trout/steelhead and sculpin use the mainstem and some of the larger tributaries, while cutthroat trout are mostly found in headwater tributaries. Bull trout are found throughout the drainage but mostly use smaller, low stream order reaches where cool, clean water is abundant. Non-native species have not been collected in U.S. Forest Service (USFS) fish survey efforts in the Yankee Fork (Gamett and Bartel 2008). Three fish species protected under the Endangered Species Act (ESA) can occur in portions of the analysis area where fish would be captured for broodstock at the proposed Yankee Fork and Panther Creek weir facilities and ultimately released: Snake River spring/summer-run Chinook salmon, Snake River steelhead, and Snake River bull trout. The relevant listing determinations and existing protective regulations are cited in Table 3.7-1. These three species are present in the Salmon River basin, where they may be impacted by the Yankee Fork and Panther Creek weir facilities.

**Table 3.7-1. Federal Register Notices for Endangered Species Act-Listed Fish Species in the Yankee Fork and Panther Creek Analysis Areas**

| Species | Listing | Critical Habitat Designation | Protective Regulations |
|---|---|---|---|
| Chinook salmon (*Oncorhynchus tshawytscha*) | | | |
| Snake River Spring/Summer-Run | 79 FR 20802 | 64 FR 57399 | 70 FR 37160 |
| Steelhead (*Oncorhynchus mykiss*) | | | |
| Snake River | 79 FR 20802 | 70 FR 52630 | 70 FR 37160 |
| Bull Trout (*Salvelinus confluentus*) | | | |
| Snake River Distinct Population Segment | 63 FR 31647 | 75 FR 63898 | 63 FR 31647 |

Critical habitat has been designated for Snake River spring/summer-run Chinook salmon, Snake River steelhead, and Snake River bull trout, and occurs within the Yankee Fork and Panther Creek portions of the analysis area.

The National Marine Fisheries Service (NMFS) determines the range-wide status of critical habitat by examining the condition of the primary constituent elements (PCEs) that were identified when critical habitat was designated. PCEs are the physical and biological features needed for life and successful reproduction of the species. These features are essential to the conservation of listed species because they support one or more of the species' life stages (e.g., spawning, rearing, migration, foraging). PCEs for Snake River spring/summer-run Chinook salmon (64 FR 57399; October 25, 1999) include four components:

- Spawning and juvenile rearing areas
- Juvenile migration corridors
- Areas for growth and development to adulthood
- Adult migration corridors

PCEs for Snake River basin steelhead (70 FR 52630; September 2, 2005) include the following components:

- Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.
- Freshwater rearing sites with: (i) sufficient water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; (ii) water quality and forage able to support juvenile development; and (iii) natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
- Freshwater migration corridors free of obstruction and excessive predation, with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.
- Estuarine areas free of obstruction and excessive predation with: (i) water quality, water quantity, and salinity conditions able to support juvenile and adult physiological transitions between fresh- and saltwater; (ii) natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and (iii) juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.
- Near-shore marine areas free of obstruction and excessive predation, with: (i) water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and (ii) natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.
- Offshore marine areas with water-quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

The Salmon River basin, which includes the analysis area, has also been designated as Essential Fish Habitat for Chinook salmon under the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267). Essential Fish Habitat for spring/summer-run Chinook salmon is defined as the bodies of water and substrate required for fish spawning, breeding, and feeding, and habitat where they can grow to maturity. Essential Fish Habitat includes all freshwater habitats used by spring-run Chinook salmon in the Salmon River basin.

The U.S. Fish and Wildlife Service (USFWS) designated critical habitat for Snake River bull trout in 2004 and revised their designation in 2010 (69 FR 59995 and 75 FR 63898, respectively). The proposed sites for the Yankee Fork and Panther Creek weir facilities lie within designated critical habitat for bull trout. The designation for critical habitat under the ESA considers the quality of PCEs of the existing habitat. PCEs for bull trout include the following components:

- Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
- Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
- An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
- Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks, and unembedded substrates to provide a variety of depths, gradients, velocities, and structure.
- Water temperatures ranging from 2 to 15 degrees Celsius (36 to 59 degrees Fahrenheit), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range would depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.
- In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment (generally ranging in size from silt to coarse sand) embedded in larger substrates is characteristic of these conditions. The size and amount of fine sediment suitable to bull trout would likely vary from system to system.
- A natural hydrograph, including peak, high, low, and base flows within historical and seasonal ranges; or, if flows are controlled, minimal flow departure from a natural hydrograph.
- Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.
- Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass), interbreeding (e.g., brook trout), or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

As described below, several fishes found in the Yankee Fork are designated under the ESA, USFS, or State of Idaho programs (Table 3.7-2). Three ESA-listed salmonids are found in the Yankee Fork, including the Snake River Distinct Population Segment (DPS) of summer-run steelhead, the Snake River DPS of bull trout, and the Snake River Evolutionarily Significant Unit (ESU) of spring-run Chinook salmon.

The section of the Yankee Fork adjacent to the proposed weir has a moderate gradient, with predominantly cobble substrates and a mixture of riffle, pool, and run habitats. The bankfull width immediately adjacent to the site ranges from approximately 50 to 90 feet. The stream is bordered by a paved road adjacent to the site, resulting in a particularly sparse riparian canopy along the east side of the stream. Habitat conditions seem to be favorable for juvenile salmon and steelhead, as well as resident trout and other native fish species.

Much of the mainstem Yankee Fork upstream of the site has been heavily altered by dredging associated with mining for gold that took place prior to 1952. The Yankee Fork gold dredge shifted the channel and altered the floodplain in much of the Yankee Fork valley bottom, leaving tall gravel tailing piles throughout the floodplain. These tailings are devoid of vegetation to this day (Reclamation 2012d). The lack of vegetation in the riparian zone is likely leading to higher water temperatures and decreased natural large woody debris input to the stream. A lack of large wood results in reduced habitat complexity with few pools that provided beneficial temperatures and cover. Aquatic habitat surveys conducted by the USFS in 2001 and 2010 (USBWP 2005; USFS 2010) indicate a low number of pools, high width-to-depth ratios, sub-optimal spawning and rearing habitat, and low large wood loading in the mainstem, particularly downstream of Jordan Creek.

Under the National Wild and Scenic River System, Yankee Fork is considered as eligible under the “Recreation” classification for Wild and Scenic Rivers (USFS 1989). Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad, and that may have some development along their shorelines or may have undergone some impoundment or diversion in the past. There are two eligible segments of the Yankee Fork relevant to this analysis—Segment A is the lower reach heading upstream from the mouth for 2 miles; Segment B is immediately upstream of Segment A, from the private land boundary upstream from the Pole Flat campground to Jordan Creek, approximately 6 miles in length. The Yankee Fork project area is located within Segment A, very near its boundary with Segment B.

The inclusion of fish as an ORV for these river segments of Yankee Fork as a Wild and Scenic River encompasses the river’s:

- Intrinsic value (i.e., our society’s desire to know fish continue to fill these rivers as they have for eons past).
- Recreational value as a sport fishery (discussed in Section 3.1, *Land Use and Recreation*).
- Cultural value to the Shone-Bannock Tribes (Tribes) (discussed Section 3.9, *Cultural Resources*).

**Table 3.7-2. Special Status Fish Species Known or Likely to be Found in Yankee Fork**

| Family and Species | Scientific Name | Presence[a] | Distribution/Primary Habitat | Origin | State/Federal Status | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ID[b] | FED[c] | USFS[d] | Critical Habitat |
| Salmon and Trout - *Salmonidae* | | | | | | | | |
| Snake River Spring/ Summer Chinook Salmon | *Oncorhynchus tshawytscha* | D | Spawn below headwater areas in mainstem and larger tributaries; lower river reaches used as juvenile winter rearing habitat; lower river used as migratory corridor. | Native | S1 | T | | 58 FR 68543 (December 28, 1993)<br><br>64 FR 57399 (October 25, 1999) |
| Snake River Steelhead | *Oncorhynchus mykiss* | D | Spawning and juvenile rearing in headwater and middle reaches of the Yankee Fork; lower river used as migratory corridor. | Native | S3 | T | | 70 FR 52630 (September 2, 2005) |
| Bull Trout | *Salvelinus confluentus* | D | Spawning/early rearing in cold headwater tributaries of the Yankee Fork; juvenile and sub-adult rearing in low-velocity habitats with cover; downstream reaches provide feeding, migrating, and overwintering habitat. | Native | S3 | T | MIS[e] | 75 FR 63898 (October 18, 2010) |
| Westslope Cutthroat Trout | *Oncorhynchus clarkii lewisi* | D | Spawning and juvenile rearing in headwater and middle reaches of the Yankee Fork; lower river used as migratory corridor. | Native | S3 | -- | S | -- |
| Lampreys - *Petromyzontidae* | | | | | | | | |
| Pacific Lamprey | *Entosphenus tridentatus* | P | Larvae found in silt-bottomed pools and glides; adults may use entire river as migratory corridor, spawn in headwaters. | Native | S1 | SC | | -- |

Notes:

[a] D = Documented in basin; P = Species has potential to be present in the basin.

[b] Idaho sensitive species status: SX = Presumed extirpated, SH = Possibly extirpated, S1 = Critically imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently secure, S5 = Secure, common.

[c] Federal Endangered Species Act status: SC = species of concern; T = threatened

[d] U.S. Forest Service Sensitive Species Designation for Forest Service-administered Lands: S = Sensitive

[e] MIS = U.S. Forest Service Salmon-Challis National Forest management indicator species

### 3.7.1.3 Panther Creek Weir Facility

Panther Creek and its tributaries drain approximately 662,000 acres of managed forestlands into the Salmon River. Surveys conducted by USFS fish biologists between 2006 and 2014 collected Chinook salmon adults and juveniles, brook trout, bull trout, apparent bull trout-brook trout hybrids, rainbow trout, westslope cutthroat trout, various unidentified whitefish species, and various unidentified sculpin species from Panther Creek and its tributaries (Garcia pers. comm.). The drainage is also believed to provide habitat suitable for and accessible to redside shiner, northern pikeminnow, Pacific lamprey, and river lamprey (Salmon-Challis National Forest 2008).

Several fish species found in Panther Creek and its tributaries have special status under the federal or state programs (Table 3.7-3). Three ESA-listed salmonids are found in Panther Creek, including the Snake River DPS of summer steelhead, the Snake River DPS of bull trout, and the Snake River ESU of spring-run Chinook salmon; see Section 3.7.1.2, *Yankee Fork Weir Facility*, for a detailed discussion of the status of these three species.

The section of Panther Creek adjacent to the proposed fish trapping and acclimation facility has a moderate gradient with predominantly cobble substrate, and a mixture of riffle, pool, and run habitats. The bankfull width immediately adjacent to the hatchery ranges from approximately 30 to 50 feet. The stream is bordered by an improved gravel roadway adjacent to the site, resulting in a particularly sparse riparian canopy along the west side of the stream. The stream is located in a steep-sided valley with dense forest and riparian zone along its east bank. Habitat conditions seem to be favorable for juvenile salmon and steelhead, as well as resident trout and other native fish species, with structurally complex in-stream habitat and suitable spawning habitat.

Water quality relative to fish needs in the Panther Creek Drainage is generally good, with the exception of streams affected by historical mining (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.1.3, *Panther Creek Weir Facility*). However, Blackbird Creek, which flows into Panther Creek approximately 1 mile downstream of the proposed weir and acclimation facility, has historically been, and will likely continue to be, impacted by releases of acidity and dissolved heavy metals from the historical Blackbird Mine site. Discharges of dissolved copper and cobalt in 1995 led the Idaho Department of Environmental Quality (IDEQ) to conclude that Blackbird Creek could not be remedied to the point of meeting water quality standards in the near future (Salmon-Challis National Forest 2008). Water quality has improved through time, though, and IDEQ reported in 2004/2005 that "water quality in Panther Creek downstream of Big Deer Creek met water quality criteria for copper most of the year with the exception of the spring high flow period of approximately March–June" (Salmon-Challis National Forest 2008).

Under the National Wild and Scenic River System, Panther Creek is considered as eligible under the "Recreation" classification for Wild and Scenic Rivers in 1993 (Appendix D). The entire Panther Creek drainage (beginning at the mouth and extending 45 miles upstream) is considered eligible.

The inclusion of fish as an ORV for Panther Creek as a Wild and Scenic River encompasses the river's:

- Intrinsic value (i.e., our society's desire to know fish continue to fill these rivers as they have for eons past).
- Recreational value as a sport fishery (discussed in Section 3.1, *Land Use and Recreation*).
- Cultural value to the Tribes (discussed in Section 3.9, *Cultural Resources*).

**Table 3.7-3. Special Status Fish Species Known or Likely to be Found in Panther Creek**

| Family and Species | Scientific Name | Presence[a] | Distribution/ Primary Habitat | Origin | State/Federal Status | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | ID[b] | FED[c] | USFS[d] | Critical Habitat |
| Salmon and Trout - *Salmonidae* | | | | | | | | |
| Snake River Spring/Summer-Run Chinook Salmon | *Oncorhynchus tshawytscha* | D | Spawn below headwater areas in mainstem and larger tributaries; lower river reaches used as juvenile winter rearing habitat; lower river used as migratory corridor. | Native | S1 | T | | 58 FR 68543 (December 28, 1993)<br><br>64 FR 57399 (October 25, 1999) |
| Snake River Steelhead | *Oncorhynchus mykiss* | D | Spawning and juvenile rearing in headwater and middle reaches of Panther Creek; lower river used as migratory corridor. | Native | S3 | T | | 70 FR 52630 (September 2, 2005) |
| Bull Trout | *Salvelinus confluentus* | D | Spawning/early rearing in cold headwater tributaries of Panther Creek; juvenile and sub-adult rearing in low-velocity habitats with cover; downstream reaches provide feeding, migrating, and overwintering habitat. | Native | S3 | T | MIS[e] | 75 FR 63898 (October 18, 2010) |
| Westslope Cutthroat Trout | *Oncorhynchus clarkii lewisi* | D | Spawning and juvenile rearing in headwater and middle reaches of Panther Creek; lower river used as migratory corridor. | Native | S3 | -- | S | -- |
| Lampreys - *Petromyzontidae* | | | | | | | | |
| Pacific Lamprey | *Entosphenus tridentatus* | P | Larvae found in silt-bottomed pools and glides; adults may use entire river as migratory corridor, spawn in headwaters. | Native | S1 | SC | | -- |

Notes:

[a] D = Documented in basin; P = Species has potential to be present in the basin.

[b] Idaho sensitive species status: SX = Presumed extirpated, SH = Possibly extirpated, S1 = Critically imperiled, S2 = Imperiled, S3 = Vulnerable, S4 = Apparently secure, S5 = Secure, common.

[c] Federal Endangered Species Act status: SC = species of concern; T = threatened

[d] U.S. Forest Service Sensitive Species Designation for Forest Service-administered Lands: S = Sensitive

[e] MIS = U.S. Forest Service Salmon-Challis National Forest management indicator species

### 3.7.1.4 Yellowstone Cutthroat Trout Release Site

Adult Yellowstone cutthroat trout would either be collected locally or the Tribes would acquire genetically pure Yellowstone cutthroat from a USFWS hatchery located in Jackson Hole, Wyoming. A large oxbow lake on the Fort Hall Reservation (Figure 2-10) would serve as the release point for subcatchable sized (5 to 6 inches) Yellowstone cutthroat trout to provide fishing opportunities for both Tribal and non-Tribal permit fishermen on the Fort Hall Bottoms. The oxbow lake does not support other salmonids or any other special status species, and is completely isolated from other surface waters.

## 3.7.2 Environmental Consequences

The potential impacts of the alternatives on fish and fish habitat fall into three general categories:

- Facility impacts, caused by construction and operation of the facilities.
- Fish capture impacts caused by capturing, handling, tagging, sampling, and removing fish for hatchery broodstock, research, and implementation monitoring.
- Ecological impacts of increased numbers of spring Chinook salmon interacting with fish already present in and outside of the area.

Each of these types of effects is described below, and then analyzed in detail for each of the proposed sites. These effects are also evaluated for their impact on the fish ORV. Additional information about the effects on the fish ORV may be found in the Wild and Scenic Rivers Section 7 Analysis (Appendix D).

The proposed hatchery and weir collection facilities could affect fish or their habitat by each of the following mechanisms.

- **In-water work.** Construction activity that requires work within a stream channel could require fish removal and relocation, which can adversely affect fish by exposing them to injury and increased stress. Installation of a coffer dam and/or silt curtains to isolate the work areas could temporarily disturb aquatic habitat. Fish not removed from the work area could be harmed or killed by dewatering, being trapped on pump screens, or being exposed to increased risk of asphyxiation as water volumes are reduced in dewatered areas.
- **Riparian vegetation clearing.** Construction that requires removal of riparian vegetation could reduce stream shading, cover, and habitat complexity.
- **Sedimentation.** Construction activities could temporarily deliver fine sediment to affected surface waters, which could cause fish to avoid the area or temporarily stop feeding, or could impair water movement through spawning gravel, causing mortality of eggs or alevins.
- **Flow modification.** Water withdrawals for operation of weirs and adult holding facilities at Yankee Fork and Panther Creek and for acclimation facility operations at Panther Creek would reduce flows in the portions of Yankee Fork and Panther Creek between the water diversion and water outfall locations. This could degrade habitat for fish and other aquatic species in the affected portion of the stream.
- **Water quality.** Operational discharges from the facilities could affect water quality in the associated streams, with potential to affect fish and their habitat.

- **Passage barriers and fish handling.** Construction and broodstock collection activities (at the proposed weirs) would temporarily and partially block passage in the Yankee Fork and Panther Creek, potentially delaying upstream migration of steelhead, bull trout, and possibly other resident fish species. Delayed migration may lead to stress, increased risk of poaching and predation, and decreased ability to survive.
- **Direct handling and removal.** As part of the hatchery production, returning adult Chinook salmon would be trapped, handled, and either passed above the weir or removed from the stream and kept for broodstock. In addition, non-target species (bull trout) would also be captured, processed, and released upstream of the weirs. The steelhead upstream migration period is earlier in the spring, and typically ceases prior to the proposed weir operations (Miller et al. 2014); however, some steelhead may be encountered during weir operations. Processing of these non-target species would include capturing, handling, sampling, tagging and fin-clipping, and observation prior to release back into the stream. Release of non-target fish may occur both up and downstream of the weir depending on the direction in which fish were traveling. These activities could cause stress and injury to individual fishes.
- **Impacts of increased numbers of spring/summer-run Chinook salmon.** Increasing numbers of naturally and/or artificially produced juvenile and adult Chinook salmon in the Salmon River basin could result in more competition with other species for food and habitat, potentially influencing the survival and reproductive success of Chinook salmon, bull trout, steelhead, and other native fish species. Increased numbers of Chinook salmon returning to spawn could stray into adjacent basins where different ESUs have evolved, resulting in interbreeding and adverse genetic effects and possibly decreases in population productivity and abundance. Increasing abundance of spring Chinook salmon would bring more marine-derived nutrients to the Salmon River basin from their carcasses and eggs, resulting in increased food web productivity benefitting native and introduced fish species.

### 3.7.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

##### Facility Impacts

The majority of proposed construction activities would occur in upland areas at least 180 feet from McTucker Creek. Upland work would comply with construction best management practices (BMPs) developed specifically for the hatchery site to ensure that there would be no effect on any fish-bearing waters from contamination by sedimentation, fuel or other construction material spills, or alteration of the aquatic or riparian habitat (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.3, *Mitigation*, for the Crystal Springs hatchery).

A 24-inch discharge pipe would replace the now defunct 36-inch discharge pipe to deliver outflow from the hatchery facility into McTucker Creek. Replacement of this pipe would require in-water work. Turbidity curtains would be used to isolate turbidity generated during construction in the work areas prior to removal and replacement of the discharge pipe.

Operation of the facility would involve routing groundwater from up to five on-site wells through the 15 outdoor circular rearing ponds, into the concrete settling pond, and through the outflow pipe into McTucker Creek. Approximately 9,450 gallons per minute of groundwater would be supplied to the rearing ponds. A metal roof structure with open sides covered by bird netting would be constructed over the rearing ponds to provide shade and protection from avian predators and to reduce algal growth in the ponds. The rearing ponds would use a dual drain system designed to remove most solid waste. Approximately 85% of the drain water would overflow through a sidewall drain box. This decanted water, which would contain essentially no solid waste, would flow to the effluent control facilities, which would further treat the water before it is discharged through the outfall to McTucker Creek. The remaining 15% of the drain water, containing most of the solids, would flow through a center bottom drain, which would concentrate fish wastes and un-eaten feed into a separate piped system that flows by gravity to the settling pond (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.21, *Alternative 1: Hatchery Program with Permanent Weirs*, i.e., environmental consequences for the Crystal Springs hatchery). All solid waste collected from the ponds would be land applied at the Legacy Springs Wildlife Area.

The settling pond would be designed to meet discharge limitations required under the general National Pollutant Discharge Elimination System (NPDES) permit for aquaculture facilities in Idaho. Use of therapeutic chemicals (e.g., iodophor as egg disinfectant, argentine or formalin for egg fungicide, oxytetracycline/erythromycin to treat juveniles for various diseases) would be consistent with regulations established 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. These guidelines would be followed during operation of the facility to ensure that the limits are not exceeded.

In consideration of these measures to address potential construction and operational effects on habitat and water quality, there is **low** potential for impacts on fish in McTucker Creek as a result of facility construction or operations. With implementation of mitigation identified in the water quality analysis (Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.3, *Mitigation*, for the Crystal Springs hatchery), those impacts would be low. In addition, stocking of Yellowstone cutthroat trout to the isolated oxbow lake would have **no** impacts on listed or sensitive species.

#### Fish Capture Impacts

Fish capture would not be performed at the Crystal Springs hatchery and thus would result in **no** impacts at this facility.

#### Ecological Impacts

All juvenile salmon produced at the Crystal Springs hatchery would be transported to acclimation and release facilities for release into the Yankee Fork and Panther Creek in the Salmon River basin. Effects of those releases from the Yankee Fork and Panther Creek weir facilities are discussed in the following sections.

### Yankee Fork Weir Facility

#### Facility Impacts

##### *Construction Impacts*

Construction activities at the Yankee Fork site would occur in both upland (above ordinary high water) and in-water work areas (Figure 2-5). Upland modifications would include construction of adult holding ponds, egg collection and preparation sheds, a chemical storage shed, two RV pads, a jib crane, and abutments associated with the weir. These proposed upland facilities (with the exception of the weir, fish ladder, and intake) would be no less than 30 feet from the Yankee Fork bank. Only 0.01 acres of riparian habitat (total for the entire facility) would be permanently disturbed. Yankee Fork Road would be realigned to curve around the new fish trapping and holding/spawning facility. In-water work would occur during construction of the weir, the water intake structure, and the fish ladder from the second week of July through the second week of August (USBWP 2005).

*Bridge Weir*

An approximately 65-foot-long permanent bridge weir would be constructed adjacent to the Pole Flat Campground on the Yankee Fork (Figure 2-5). Construction of the weir would entail temporarily re-routing the main Yankee Fork channel during the in-water work window via a temporary channel. The temporary channel would be used to dewater the in-channel construction area. The construction area would also be isolated using a sand or soil bag coffer dam and temporary pump system. Anchors for the pre-cast concrete sill and abutments would be placed within the dewatered area, and the sill and abutments installed. A fish rescue and relocation plan would be developed for the site, and reviewed and approved by NMFS. The rescue and relocation would be implemented by trained staff during dewatering to protect aquatic species. After flow is restored to the main channel, native plants would be planted within the temporary channel to reestablish the character of the disturbed area. Construction BMPs would be implemented, including silt fencing between the upland facilities and the river, and turbidity curtains downstream of the construction area (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.3, *Mitigation*, for the Yankee Fork weir facility). Daily monitoring for turbidity would occur throughout the period of in-water work, ensuring and documenting that construction would be **moderate** and long-term impacts on the aquatic environment would be **low**. Turbidity measurements would ensure that construction turbidity effects comply with IDEQ, U.S. Army Corps of Engineers, and USFS permit requirements. If turbidity is non-compliant, construction would be halted until remedies are in place. IDEQ water quality standards require that turbidity "shall not exceed background turbidity by more than 50 Nephelometric Turbidity Units (NTU) instantaneously or more than 25 NTU for more than 10 consecutive days" (IDAPA 58.01.02.250.02e).

Fish migrating through the temporary channel would experience only slight delays (24 hours) and this would have a **low** impact on fish species.

*Jib Crane*

A jib crane is a permanent crane that would be installed adjacent to the bridge weir (within the construction footprint for the weir) and used to remove debris from the weir. It could also possibly be used for lifting fish for transfer to transport trucks or from a live box to the holding pools if the fish ladder is not effective at attracting fish at certain times. Short-duration, localized turbidity increases around the work area could affect fish in the area by impairing foraging, delaying migration, or exposing their gills to silt, but these effects would be temporary, resulting in a **low** impact on fish species and a temporary effect on their habitat.

*Water Intake and Fish Ladder Discharge*

A gravity flow intake for the collection facility water supply would be located in a large eddy approximately 1,100 feet upstream of the proposed site. The intake would be screened by a self-cleaning cone screen installed in a pre-cast concrete structure. The cone screen would be compliant with current NMFS standards (NMFS 2011a) to minimize fish entrainment or impingement risk. Water from the facility would be discharged through a new fish ladder just downstream of the weir. Similar to the other in-water work elements, installation of both the intake structure and fish ladder would require isolation of the stream prior to excavation and construction and would be installed during the prescribed in-water work window. A turbidity curtain would isolate the stream bank where construction is to occur. A fish rescue and relocation plan would be developed for the site, and would be reviewed and approved by NMFS prior to removing fish from the isolation area. Any fish not removed from the isolated area would likely die. Short-duration, localized turbidity increases around the work area could affect fish in the area by impairing foraging, delaying migration, or exposing their gills to silt, but these effects would be temporary, resulting in a **low** impact on fish species and a temporary effect on their habitat.

*Juvenile Acclimation Pond*

No construction would be required to create an acclimation pond to acclimate juvenile Chinook salmon at the Yankee Fork weir facility. Existing off-channel ponds located about 0.25 mile upstream of Pole Flat Campground, adjacent to the Yankee Fork, would be used to acclimate juvenile fish prior to release (Figure 2-5). The smolts would be released to the acclimation pond in batches of about 80,000 fish at a time in three-day cycles (the rate of transport of smolts to the site is related to the capacity of the transport vehicles to be used). The smolts would not be fed during acclimation and would leave the ponds volitionally through an existing culvert to the Yankee Fork. No chemicals or prophylactic drug treatments would be used on juveniles during acclimation. As a result, there is a **low** potential for acclimation operations to impact water quality or habitat in the Yankee Fork.

*Adult Holding Ponds*

Concrete holding ponds for the collected adult salmon would be constructed on the east bank of the Yankee Fork (Figure 2-5). Construction would entail vegetation clearing within the footprint of the holding ponds. This loss of vegetation is not expected to affect riparian function because existing vegetation in the affected area is sparse and not located near the stream (see Section 3.4, *Vegetation*). The construction of the holding ponds and spawning facilities would follow BMPs, such as use of silt fences, to avoid impacts on aquatic habitat. A spill containment plan, invasive species control plan, and erosion control plan for all areas disturbed by construction activities would be prepared and approved during the permitting process prior to construction, and would be implemented and monitored to ensure that effects on the aquatic environment are **low**.

*Egg Collection and Preparation Structures*

A three-sided structure would be built adjacent to the adult holding ponds for collecting eggs from adult fish, and a fully enclosed metal-sided one-story structure would be built for egg preparation (Figure 2-5). Clearing for these structures would entail vegetation removal. The loss of vegetation is not expected to affect riparian function because existing vegetation in the affected area is sparse and not located near the stream. The construction of the egg collection and preparation facilities would follow BMPs, such as use of silt fences, to avoid impacts on aquatic habitat. A spill containment plan, invasive species control plan, and erosion control plan for all areas disturbed by construction activities would be prepared and approved during the permitting process prior to construction, and would be implemented and monitored to ensure that effects on the aquatic environment are **low**.

*Chemical Storage Shed*

A 10-foot by 20-foot chemical storage building would be installed adjacent to the fish holding ponds to hold formalin, which would be used as a disinfectant. The formalin would be pumped via underground pipes leading from barrels in the chemical storage shed to the water supply in the post-sort holding ponds approximately 25 feet away. The chemical storage shed is a pre-manufactured shed specific to the purpose of chemical storage, and is designed to contain accidental spills. The shed would hold at least one operating season's quantity of formalin (eight 55 gallon barrels), as well as the pumping and distribution piping. The shed and formalin would be transported to the site. At the end of each season, the storage containers and any excess formalin would be removed from the site for winter storage and would be inspected prior to the next season's use. A spill containment plan would be prepared and implemented. With these precautions, there would be **low** potential for any unintended release of formalin to the aquatic environment and fishes.

*RV Pads*

Two 30-foot by 10-foot areas would be graded and graveled, enabling parking of two recreational vehicles (RVs) that would house employees during the adult trapping season (Figure 2-5). Short-duration, localized turbidity increases around the work area during construction could affect fish in the area by impairing foraging, delaying migration, or exposing their gills to silt, but these effects would be temporary, resulting in a **low** impact on fish species and a temporary effect on their habitat.

*Yankee Fork Road Realignment*

About 425 feet of the existing paved road would be removed and a new 675-foot section of road would be constructed to the east and curved to avoid the Yankee Fork site (Figure 2-5). The road would be constructed of the same materials as the existing road section. Construction BMPs would be implemented to minimize the potential for stormwater runoff to surface waters (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.3, *Mitigation*, for the Yankee Fork weir facility). Localized increases in turbidity could occur if heavy precipitation events occur during construction. Given the short duration of these events and the minimization measures implemented as part of the erosion control plan, construction impacts on fish and their habitat would be **low**.

***Operational Impacts***

*Surface Water Withdrawal and Fish Habitat*

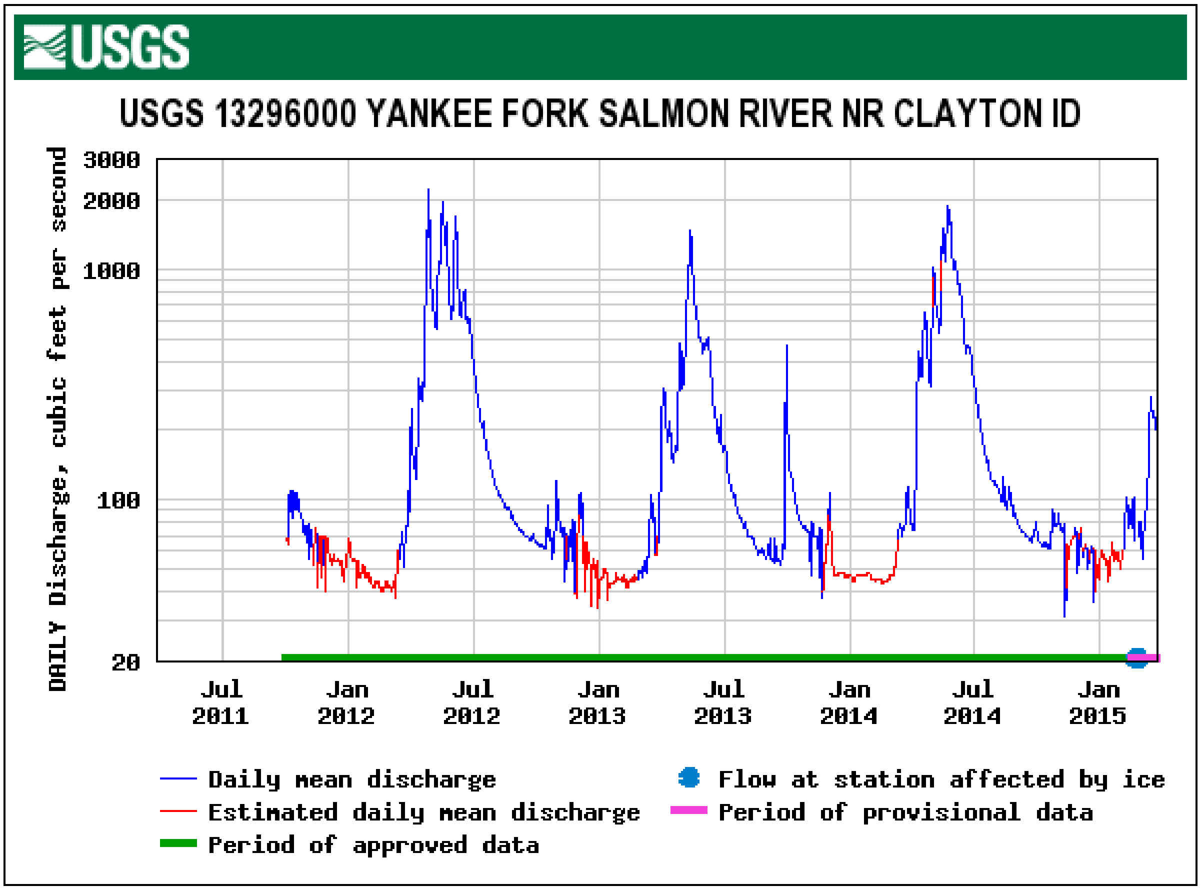
The Tribes would obtain a non-consumptive water right from the Idaho Department of Water Resources to operate the adult holding ponds at the Yankee Fork weir facility. Water would flow through the facility back to the river. Water loss is not expected to be measurable; however, there may be a small volume of water loss due to evaporation, spills, or any leaks during flow-through. The distance between the intake and the discharge through the fish ladder is approximately 1,260 feet. The water flow rate through the facility would be approximately 10 cubic feet per second (cfs), so flow in the Yankee Fork would be diminished by this amount in the reach between the intake and the discharge.

Flow in the Yankee Fork typically ranges from a winter low of about 40 cfs to a spring peak of up to 2000 cfs (Figure 3.7-1). The facility would be operated between June and October, during which time the monthly mean flow of the Yankee Fork ranges between 934 and 73 cfs, respectively (USGS

2015a). On average, facility water requirements would divert up to a late summer maximum of 14% of Yankee Fork flow (10 cfs usage relative to mean flows of 73 cfs). Historically, flows in the Yankee Fork have been as low as 48 cfs (daily mean) in September, which would result in use of up to 21% of the streamflow for facility operations. Earlier in the summer, when flows are higher, the flow reduction would generally be less than 5% of streamflow.

This reduction in flow may result in a comparable reduction in habitat available to fish between the intake and the outfall, primarily in shallow water at the edges of the channel, and not in the main channel. The reduction in habitat would be small relative to typical year-to-year variations caused by flow variation under current conditions. Effects on fish and their habitat would likely be limited to the shallow side channel habitat in the 1,260-foot section of Yankee Fork between the intake and outfall, which is a small proportion of the habitat available in the basin as a whole, and is not of exceptional value relative to adjacent upstream and downstream reaches of the stream. There is ample habitat for spawning and rearing upstream of the intake as well as downstream of the outfall. These small reductions in the proportion of available flow between the intake and fish ladder are not sufficient to produce an impediment to migrating fish, and fish would not be impeded in accessing adjacent habitat if it is better. Because the water use would not dewater the stream, and fish use would likely be concentrated in deeper areas during extreme low flows, it is likely that fish in the affected section of the stream would only experience a small reduction in available habitat. Because the diversion is non-consumptive, the volume of the diversion would be a small percentage of the flow in the Yankee Fork and would be returned to the Yankee Fork 1,260 feet downstream of the intake; therefore, the impact of the diversion would be **low**.

**Figure 3.7-1. Yankee Fork Flow Discharge (cubic feet per second): 2011-2015**




*Facility Discharges*

Because fish rearing would take place off site at the proposed Crystal Springs hatchery and acclimating juveniles would be held, without feeding, for only short durations in the ponds just upstream of the Yankee Fork weir facility, wastes produced by acclimating juveniles would be minimal, and not expected to result in any adverse impacts on water quality in the Yankee Fork. Therefore, the discharge from the acclimation ponds would have **low to no** impact on fish or their habitat.

Adults would be held at the Yankee Fork weir facility through summer until they are mature and ready to spawn in the fall. Adult salmonids do not feed once they have entered freshwater on their spawning migration, so waste production from these fish would be negligible. Formalin is the only chemical that may be used to treat fish in the adult holding ponds. Formalin would be added to the water in the adult holding ponds as a disinfectant to control the growth of fungus on the bodies and gills of adults, which could lead to increased mortality. This use would typically only occur if water temperatures became high enough to cause increased risk of disease activity and transmission. Use of formalin 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 treatment chemicals. As described in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, i.e., environmental consequences for the Yankee Fork weir facility, formalin treatments would result in 1 milligram per liter of formalin in the discharge, which is the most conservative concentration for protection of aquatic life (FDA 1995). The Tribes would apply for an NPDES permit for the Yankee Fork facilities. If granted, the Tribes would be required to monitor the discharges under the NPDES permit and ensure that the Yankee Fork weir facility would comply with the NPDES discharge limitation of 1 milligram per liter or less formalin concentration. In consideration of this practice, formalin use would have for a **low** impact on fish and their habitat in the Yankee Fork.

#### Fish Capture Impacts

The Yankee Fork fish trapping facilities would be operated from June to September each year to collect Chinook salmon for broodstock. The weir would direct fish to the fish ladder and to the sorting and holding facilities. In the sorting pond, fish would be sorted, and non-target fish, such as bull trout, steelhead, and other game and non-game fish would be released upstream of the weir. In addition, if bull trout were observed congregating above or below the weir, some of the weir pickets would be temporarily rotated out of the water to allow passage by the fish.

Operation of a weir can affect fish in several ways. Direct impacts such as injury can occur at the time of capture, while indirect impacts, such as changes in behavior or health from delayed migration, can occur later. Fish would be typically trapped and handled at the weir and the presence of a weir could lead to delay in upstream and downstream migration of fish. Consequences of migration delay can vary depending on site-specific conditions and context. Extended migration delay lasting more than 24 hours or delay during periods when temperature and habitat conditions are unfavorable can have a number of adverse effects on salmonids (McCullough 1999; Goniea et al. 2006; Bjornn and Reiser 1991). Delayed migration in high-current areas can increase energy expenditure, reducing energy reserves necessary for successful spawning. Delay during periods with elevated water temperatures can increase exposure to unfavorable temperature conditions, resulting in reduced survival and fitness. Migration delay in locations without suitable cover can expose migrating fish to predation and poaching mortality (Cuenco and McCullough 1996; McCullough et al. 2001).

Because collection activities could affect ESA-listed species, Bonneville Power Administration (BPA) is consulting on the effects of the Hatchery Program with the USFWS and NMFS under the ESA. To ensure that potential effects on ESA-listed fish species are minimized, including impacts from broodstock collection, the Tribes would implement the avoidance, minimization, and mitigation measures identified by USFWS and NMFS during the consultation. These measures would include, but are not limited to, limiting the duration and frequency of collection activities to avoid and minimize migration delays, and adopting procedures intended to minimize stress and injury from handling and release after inadvertent capture in trap facilities. The Tribes have adopted a fish-handling plan for the current weir operations for the protection of non-target species; this plan would also be implemented at the proposed Yankee Fork and Panther Creek weir facilities.

The Tribes would operate the weirs at Yankee Fork and Panther Creek under an annual Idaho Scientific Collecting Permit and authorization under the Endangered Species Act by the National Marine Fisheries Service, as it currently does with the temporary weirs used on the Yankee Fork. Fish would only be handled by personnel listed under those permits.

Non-target species, including some Chinook salmon (not collected for spawning for the hatchery rearing program) would be passed above the weirs and would be visually examined for phenotypic characteristics and to collect morphometric data. Each fish would be visually examined to determine species and gender; measured to the nearest 0.5 centimeter; weighed to the nearest 0.1

kilogram; inspected for fin-clips, pre-existing marks and injuries; and scanned for external and internal tags. Natural-origin Chinook salmon would be anesthetized and tissue-sampled for DNA analysis. The tissue sample would be taken from the right operculum with a hole punch. The operculum punch would also serve as a mark, indicating that the fish was trapped at the weirs and would be part of the mark-recapture evaluation for estimating total escapement above the weirs. Natural-origin and hatchery-origin Chinook salmon collected for broodstock would be moved to the holding ponds after sorting. All non-target species would be released above the Yankee Fork and Panther Creek weirs.

In the recent years, there has been an increase in the number of bull trout returning to the Yankee Fork. With the monitoring infrastructure already in place, the Tribes, separate from the Hatchery Program and if approved under ESA collection and research permits, would also implant Passive Integration Transponder tags to adult bull trout to help acquire information on residency, abundance, age structure, and migration timing. Ultimately, bull trout would be handled similarly to natural-origin Chinook salmon and released above the weirs.

Once all fish were enumerated and processed, the weir structure would be cleaned and checked to ensure proper function. Staff would snorkel or walk the upstream and downstream periphery of the weir to ensure the structure is sealed and functioning properly. In addition, weir staff would collect carcasses that wash up on the weir face (upstream side). All carcasses would be visually examined for phenotypic characteristics and to collect morphometric data. All carcasses would be used in mark-recapture evaluations and processed for biological data. The caudal fin would be removed from each carcass to prevent duplicate counting and the carcasses would subsequently be distributed below the weir to enable nutrient enrichment.

### Ecological Impacts

#### *Principles of Interaction between Hatchery-Raised and Natural-Origin Salmonids*

The release of hatchery-reared juvenile Chinook salmon in Yankee Fork and Panther Creek would create the potential for competition, predation, and premature emigration due to hatchery releases sharing juvenile rearing areas with the progeny of naturally-spawned fish. Competition can adversely affect natural-origin fish when hatchery fish utilize limited resources (primarily food) needed by the natural-origin fish. Predation occurs when hatchery fish consume natural-origin fish (many salmonids primarily prey on other salmonids) or displace them to habitats where they are more exposed to predators. Premature emigration occurs when natural-origin fish are displaced from rearing habitat and must migrate without having achieved the size, nutritional reserves, and physiological changes needed to ensure a high probability of successful migration.

Factors influencing these risks include the following:

- Use of a limited resource by hatchery fish can reduce the availability of that resource for natural origin-fish, reducing productivity and chance of survival for the natural-origin fish (SIWG 1984).
- Hatchery fish can displace natural-origin fish from suitable habitats, especially when hatchery fish are more numerous, are of equal or greater size, take up residency before natural-origin fry emerge from redds, or residualize.[1]

[1] A residual is a smolt that remains on site in the stream rather than migrating toward the ocean.

- Hatchery fish can increase the risk of predation of natural-origin fish by causing them to alter their behavior or use of habitat (Hillman and Mullan 1989; Steward and Bjornn 1990). Predation may be greatest when large numbers of hatchery smolts encounter newly emerged fry or fingerlings, or when hatchery fish are large relative to natural-origin fish (SIWG 1984).
- Hatchery-origin fish may alter the migratory responses or movement patterns of natural-origin fish, leading to a decrease in foraging success (Hillman and Mullan 1989; Steward and Bjornn 1990). These impacts depend on the degree of dietary overlap, food availability, size-related differences in prey selection, and differences in foraging tactics and microhabitat use (Steward and Bjornn 1990).
- Factors that influence the risk of competition include whether competition is intraspecific (within a species or individuals from the same species) or interspecific (existing or occurring between different species); the duration of freshwater co-occurrence of hatchery and natural-origin fish; relative body sizes of the two groups (newly-released hatchery smolts are commonly larger than natural-origin fish); prior residence of shared habitat (usually natural-origin fish are already present when hatchery fish are released); environmentally-induced developmental differences; and density in shared habitat (likely the most influential of these factors) (Tatara and Berejikian 2012).
- En masse hatchery salmon smolt releases may displace rearing natural-origin juvenile salmonids from occupied stream areas, leading them to abandon advantageous feeding stations, or to prematurely migrate (Pearsons et al. 1994).
- Residual smolts may compete for food and space with natural-origin juveniles of similar age, and may prey on younger, smaller juveniles. Although residualism is most common among hatchery steelhead, it has been reported as a potential issue for hatchery Chinook salmon as well.
- In general, the threat from predation is greatest when natural populations of salmon and steelhead are at low abundance; when habitat, particularly refuge habitat, is limited; and when environmental conditions favor high visibility.

The risks of competition and predation between hatchery-origin and natural-origin fish can be minimized by:

- Operating hatcheries such that hatchery fish are reared to sufficient size that smoltification[2] occurs in nearly the entire population.
- Releasing hatchery smolts in lower river areas, below areas used for stream-rearing natural-origin juveniles.
- Releasing all hatchery fish as actively migrating smolts through volitional release practices, so that the fish migrate quickly seaward. This limits the duration of interaction with any co-occurring natural-origin fish downstream of the release site and reduces the chances of residualization (failure to migrate to the ocean).
- Monitoring the incidence of residualization after release and adjusting rearing strategies, release location, and timing if substantial competition with natural-origin rearing juveniles is determined likely.

[2] Smoltification is a series of physiological changes (e.g. change in body shape, skin reflectance) that occur when juvenile salmonids adapt from living in freshwater to living in seawater

For adult Chinook salmon, ecological effects of hatchery release include effects from competition for spawning sites and redd superimposition, contributions to marine-derived nutrients, and the removal of fine sediments from spawning gravels. Ecological effects on the spawning grounds may be positive or negative. To the extent that hatcheries contribute added fish to the ecosystem, there can be positive effects. For example, when anadromous salmonids return to spawn, hatchery-origin and natural-origin alike, they transport marine-derived nutrients stored in their bodies to freshwater and terrestrial ecosystems. Their carcasses provide a direct food source for juvenile salmonids and other fish, aquatic invertebrates, and terrestrial animals, and their decomposition supplies nutrients that may increase primary and secondary production (Kline et al. 1990; Piorkowski 1995; Larkin and Slaney 1996; Gresh et al. 2000; Murota 2003; Quamme and Slaney 2003; Wipfli et al. 2003). As a result, the growth and survival of juvenile salmonids may increase (Hager and Noble 1976; Bilton et al. 1982; Holtby 1988; Ward and Slaney 1988; Hartman and Scrivener 1990; Johnston et al. 1990; Larkin and Slaney 1996; Quinn and Peterson 1996; Bradford et al. 2000; Bell 2001; Brakensiek 2002).

***Ecological Impacts Expected under Alternative 1***

The general effects of interactions between hatchery-raised and natural-origin fish, described above, may occur as a result of facility operations. These effects may primarily occur in Yankee Fork and Panther Creek at the proposed facilities and downstream from them, including in the Salmon River. There may also be some straying of hatchery-origin smolts into other Salmon River tributaries, again with the potential for interactions with natural-origin fish. Such impacts would be few and would be much smaller in magnitude than the effects likely to occur within Yankee Fork and Panther Creek at and near the proposed facilities.

There may also be effects from encounters with natural-origin fish that are incidental to the conduct of operating the weir—specifically capturing, handling, sorting, and holding of natural-origin fish in the course of broodstock collection. Generally speaking, the more a hatchery program handles fish or delays migration, the greater the negative effect on ESA-listed species and on natural-origin and hatchery-origin fish that are intended to spawn naturally. The facilities, practices, and protocols for collecting broodstock, and the environmental conditions under which broodstock collection is conducted, can reduce the impact for ESA-listed fish.

Ultimately, the goal of the Hatchery Program, and the Yankee Fork weir facility in particular, is 1,500 adult spring/summer-run Chinook salmon returning to the Yankee Fork basin to spawn each year, of which 1,000 would be taken for harvest by the Tribes and 500 would be left to spawn naturally in the system. Abundance of returning adults (including adult outplants from the Sawtooth Fish Hatchery) in recent years has varied widely, from 0 in 1995 to 1,935 in 2008, and 294 in 2013 (Denny and Tardy 2010, Denny et al. 2014). Increased numbers of returning spring/summer-run Chinook salmon could increase competition with other fish for habitat and food, thereby influencing the survival and reproductive success of bull trout, steelhead, and other native fish species. However, returning adult Chinook salmon spawning habitat and timing would not overlap with that of other salmonids because Chinook salmon would spawn in the mainstem while other salmonids and bull trout spawn in the tributary streams. In addition, adult salmon do not feed when returning to spawn.

Although steelhead trout, redband, and cutthroat trout occupy similar areas in the analysis area, they do not share the same spawning habitat with spring/summer-run Chinook salmon: the salmon spawn in the fall, while the steelhead and resident rainbow and cutthroat trout spawn in the spring

(Howell and Sankovich 2012; Mahoney et al. 2009, 2011; Mendel et al. 2007; Starcevich et al. 2012; Weeber et al. 2007). Therefore, spring/summer-run Chinook salmon would not compete with steelhead and other trout for spawning habitat. Juvenile spring/summer-run Chinook salmon typically emerge from the spawning gravel earlier than steelhead, giving them the competitive advantage of being larger within the first year. However, long coevolution of these species has resulted in selective partitioning into different microhabitats, limiting the extent of direct competition and incidences of predation by one species on the other. Studies of competitive interactions between introduced juvenile spring/summer-run Chinook salmon and native steelhead indicate that the effects on juvenile steelhead productivity of spring/summer-run Chinook salmon reintroduction are low (Hillman et al. 1987; McMichael et al. 1999; Underwood et al. 1995).

In contrast, the timing of bull trout and spring/summer-run Chinook salmon spawning in the Yankee Fork basin overlaps almost completely, and there is the potential for partial overlap in spawning habitat selection. Although they may spawn at similar times, there is currently little spatial overlap between spring/summer-run Chinook salmon and bull trout spawning in the Yankee Fork basin because of microhabitat selection. There is, however, a chance for greater overlap as numbers of spawning spring/summer-run Chinook salmon increase. This could result in adverse effects on bull trout because adult spring/summer-run Chinook salmon have a size-based competitive advantage over adult bull trout, which allows spring/summer-run Chinook salmon to out-compete bull trout for spawning sites, limiting the amount of spawning habitat available. Spring/summer-run Chinook salmon are also capable of displacing bull trout and superimposing their own redds on bull trout redds, resulting in the exposure and death of bull trout eggs. Where overlap occurs between spring/summer-run Chinook salmon and bull trout, juvenile bull trout are often larger than juvenile spring/summer-run Chinook salmon and have a clear competitive advantage (Young 2004). This size difference is sufficiently large that bull trout have been observed feeding on juvenile spring/summer-run Chinook salmon. Additionally, Underwood et al. (1995) found no evidence of substantial competition for rearing habitat between spring Chinook salmon and bull trout in several southwest Washington streams. They observed that the two species used dissimilar microhabitats.

Therefore, due to this temporal and spatial separation in habitat use, increased numbers of spring/summer-run Chinook salmon in the basin are expected to result in **low** impacts on bull trout and other fish species.

***Principles of Genetic Interaction between Salmonids***

Some degree of genetic change and fitness reduction is expected in hatchery fish and in the progeny of naturally spawning hatchery fish, relative to desired levels of diversity and productivity for natural populations. This change results in altered gene frequencies in hatchery-origin fish relative to natural-origin fish, which in turn may result in reduced genetic fitness when hatchery-origin and natural-origin fish interbreed. This may thereby create a risk to recovery of the species if not controlled.

However, there are also benefits to hatchery supplementation of natural populations, and it may be an appropriate conservation strategy if the demographic or short-term extinction risk to the population exceeds the risks to genetic fitness. Conservation hatchery programs may accelerate recovery of a target population by increasing abundance faster than would occur naturally (Waples 1999). Hatchery programs can also be used to create genetic reserves for a population to prevent the loss of its unique traits due to catastrophes (Ford 2011). However, there is considerable uncertainty regarding genetic risk. The extent and duration of genetic change and fitness loss and the short- and long-term implications and consequences for different species, for species with multiple life-history types, and for species subjected to different hatchery practices and protocols remains unclear.

Within-population genetic diversity is a general term for the quantity, variety, and combinations of genetic material in a population (Busack and Currens 1995). Within-population diversity is gained through mutations or gene flow from other populations and is lost primarily due to genetic drift, a random loss of diversity due to population size. The rate of loss is determined by the population's effective population size, which can be considerably smaller than its census size. For a population to maintain genetic diversity reasonably well, the effective size should be in the hundreds; diversity loss can be severe if the effective size drops to a few dozen (Lande and Barrowclough 1987).

Hatchery programs, simply by creating more fish, may increase effective population size, and can thereby preserve genetic diversity. However, hatchery programs can also depress effective size by two mechanisms. One is by the simple removal of fish from the population so that they can be used in the hatchery. If a substantial portion of the population is taken into a hatchery, the hatchery becomes responsible for that portion of the effective size, and if the operation fails, the effective size of the population would be reduced (Waples and Do 1994). Second, effective size can also be reduced by using a skewed sex ratio, spawning males multiple times (Busack 2007), and by pooling gametes. Pooling semen is especially problematic because when semen of several males is mixed and applied to eggs, a large portion of the eggs may be fertilized by a single male (Gharrett and Shirley 1985; Withler 1988). Factorial mating schemes, in which fish are systematically mated multiple times, can be used to increase effective population size (Fiumera et al. 2004; Busack and Knudsen 2007).

Outbreeding effects are caused by gene flow from other populations. Gene flow occurs naturally among salmon and steelhead populations, a process referred to as straying (Quinn 1993; 1997). Natural straying preserves diversity that could otherwise be lost through genetic drift, and straying also serves to recolonize vacant habitat. Hatchery programs can result in straying outside natural patterns for two reasons. First, hatchery-origin fish may exhibit reduced homing fidelity relative to natural-origin fish (Grant 1997; Quinn 1997; Jonsson et al. 2003; Goodman 2005), resulting in unnatural levels of gene flow into recipient populations, either in terms of sources or rates. Second, even if hatchery fish home at the same level of fidelity as natural-origin fish, their higher abundance can cause elevated straying into recipient populations. Hatchery programs should ensure that their practices do not lead to higher rates of genetic exchange with fish from natural populations than would occur naturally (Ryman 1991). Rearing and release practices and ancestral origin of hatchery fish can all play a role in straying (Quinn 1997).

#### *Genetic Effects Expected under Alternative 1*

The risk of genetic impacts from the implementation of Alternative 1 would increase as the numbers of Chinook salmon returning to spawn increase. As more hatchery-origin Chinook salmon return to the basin, they would be available to interbreed in the wild and in the hatchery. Additionally, project fish could stray into adjacent river basins inhabited by different spring-run Chinook salmon populations such as the Snake River spring/summer-run Chinook salmon ESU, which is listed under ESA as threatened.

As the Hatchery Program develops a locally adapted population, any initial risk of straying is expected to decrease substantially. The potential for straying is inherent among anadromous fish because it provides an adaptive mechanism ensuring that suitable habitat is colonized soon after it becomes available, and because environmental factors such as river flows, passage conditions, and temperature can affect fish migration, causing fish to end up spawning in areas other than their natal stream.

Under Alternative 1, the potential for straying would likely be lower than under existing conditions because broodstock and adults would be collected from within the Yankee Fork basin and smolts would be released in the basin following a period of acclimation, which is expected to improve homing fidelity. These fish would be imprinted to waters of the basin and would be drawn to return to the same general area. In the initial stages of the proposed Hatchery Program, broodstock and adults may continue to be supplemented from the Sawtooth Hatchery if local returns are insufficient to meet production goals. However, fewer fish would come from out of the basin compared to the existing program.

BPA is consulting with NMFS on the genetic effects of the Hatchery Program on natural-origin Chinook salmon (as well as on other potential effects on ESA-listed fish under NMFS jurisdiction), and as part of that process is submitting a Hatchery and Genetics Management Plan (HGMP) to NMFS (Shoshone-Bannock Tribes 2013). The Tribes would manage spawning interaction (in the hatchery and in the wild) so that genetic influences from hatchery production are balanced with demographic risk of extinction of the population. To accomplish this, the HGMP includes guidance for the proportion of hatchery and natural fish that would be used in broodstock as well as those allowed to spawn in the wild based on natural-origin returns. In addition, the HGMP included plans to keep straying at levels of less than 5% of total spawning returns (this metric would remain the same under the 50% production option), a benchmark value established to minimize the potential genetic impacts of potential intermixing (Shoshone-Bannock Tribes 2013). The Tribes would tag and mark all hatchery-origin fish released in the basin, allowing for management of adult returns as well as monitoring of straying rates. In the event that straying rates exceed acceptable thresholds, the Tribes would implement the following mitigation measures to reduce the number of strays:

- Reduce hatchery production to decrease the total number of hatchery-origin adults.
- Target harvests to decrease the number of hatchery-origin adults returning to the basin.
- Trap and remove hatchery-origin fish before they reach spawning areas.

As the Hatchery Program size increases, it is expected that both hatchery- and natural-origin adult Chinook salmon abundance would increase. Because homing fidelity is expected to be high, the ability to manage returning adults increases, and the risk of straying decreases.

For these reasons, genetic impacts of the Hatchery Program on other fishes would be **low**.

### Wild and Scenic Rivers Act

As described above, effects on the fish ORV would be occur during construction of the weir facilities, however, these effects would be temporary and localized. Operational effects would occur while the weirs were in use; however, this proposed Hatchery Program is intended to be temporary until fish runs are restored. Temporary in this context may mean many decades, but the intention is that these artificial means of re-establishing and supporting fish runs would ultimately become unnecessary as native and naturalized populations provide all the reproduction and escapement necessary to maintain populations at historic and desired levels. Beneficial effects would include the restoration of threatened Chinook salmon runs sufficient to support Tribal and recreational fishing, strengthening the river’s eligibility for future Wild and Scenic Rivers Act designation.

## Panther Creek Weir Facility

### Facility Impacts

#### *Construction Impacts*

The Panther Creek weir facility is proposed to be located at the USFS Cobalt Work Center, approximately 1 mile upstream of Blackbird Creek on the mainstem Panther Creek. Modifications to the Panther Creek site would occur in both upland and in-water work areas. Upland modifications would include construction of adult holding ponds, egg collection and preparation sheds, a chemical storage shed, a jib crane, and abutments associated with the weir. In-water work would be associated with construction of the weir, the water intake structure, and the facility fish ladder, and would be timed to occur only during in-water work windows established for Panther Creek by USFWS and NMFS during consultation (USBWP 2005).

*Bridge Weir*

An approximately 38-foot-long bridge weir is proposed at Panther Creek. Construction of the weir would entail re-routing the main Panther Creek channel during the in-water work window through a constructed temporary channel for approximately two weeks. The temporary channel would be used to dewater the in-channel construction area. The construction area would be isolated using a sand or soil bag coffer dam and temporary pump system. Anchors for the pre-cast concrete sill and abutments would be placed within the dewatered area, and the sill and abutments installed. A NMFS/IDFG-approved fish rescue and relocation plan would be implemented during dewatering to protect aquatic species. Following construction of the weir and fish ladder, the water flow would be slowly released through the dewatered area and the temporary channel would be closed to Panther Creek. Upon removal of the temporary channel, all native plants would be planted within the temporary channel area to reestablish the character of the disturbed area. Construction BMPs would be implemented, including sediment and silt fencing downstream of the construction area. Daily monitoring for turbidity would occur throughout the period of in-water work to ensure and document that long-term impacts on the aquatic environment would be **low**. Fish migrating through the temporary channel would not experience significant delays. There would be a **low** impact on fish transiting the channel.

*Jib Crane*

A jib crane is a permanent crane that would be installed adjacent to the bridge weir (within the construction footprint for the weir) and used to remove debris from the weir. It could also possibly be used for lifting fish for transfer to transport trucks or from a live box to the holding pools if the fish ladder is not effective at attracting fish at certain times. By following the spill containment and erosion control plans, construction of the jib crane would have a **low** effect on fish or their aquatic habitat in Panther Creek.

*Water Intake and Fish Ladder*

A gravity flow intake for the collection facility water supply would be located on the left bank of Panther Creek approximately 700 feet upstream of the site. The intake would provide approximately 10 cfs of water to the site. The proposed intake screen would be a self-cleaning cone screen installed in a pre-cast concrete structure. The cone screen would be compliant with the most current NMFS standards (NMFS 2011a) to minimize fish entrainment or impingement risk. Similar to the other in-water work elements, installation of the intake structure and fish ladder would require isolation of the stream prior to excavation and construction. Coffer dams would isolate the stream bank where construction is to occur, any fish within the isolated area would be removed, and the area would be dewatered. All efforts would be made to salvage any fish within the isolated area; however, any fish evading removal would likely die. Short-duration, localized turbidity increases could affect fish in the area by impairing foraging, delaying migration, or exposing their gills to silt, but these effects would be temporary, resulting in a **low** impact on fish species and a temporary effect on their habitat.

An additional intake structure would be located on Dummy Creek, to the west of the holding tanks, to provide a 1 cfs water supply to the holding tanks in later summer when Dummy Creek is colder than Panther Creek. Use of the colder Dummy Creek water would improve adult holding conditions. The small intake structure on Dummy Creek would consist of a screened intake in the bottom of the creek channel, wing wall abutments, and a cut-off wall to stabilize the right bank of the creek upstream of the diversion structure, and would meet NMFS criteria (NMFS 2011a) for juvenile fish protection. Similar to the other in-water work elements, installation of the intake structure would require isolation of the stream prior to excavation and construction. Coffer dams would isolate the stream bank where construction is to occur, any fish within the isolated area would be removed, and the area would be dewatered. All efforts would be made to salvage any fish within the isolated area; however, any fish evading removal would likely die. Some minor effects due to short-duration, localized turbidity increases could occur but would have a **low** impact on fish species and only a temporary effect on their habitat.

*Juvenile Acclimation Ponds*

Modular portable circular ponds would be used to acclimate smolts at the Panther Creek site. The smolts would be trucked from the Crystal Springs hatchery for short-term acclimation and stress relief. The Panther Creek weir facility would be designed to accommodate up to 135,000 fish (sized at 10 fish per pound) but would typically hold about 80,000 smolts at a time for acclimation in three-day cycles. Construction BMPs would be implemented and the installation of the juvenile acclimation ponds would have **no to low** impact on fish or their aquatic environment in Panther Creek.

*Adult Holding Ponds*

Aboveground concrete holding ponds for the adult salmon collected would be constructed on the east bank of Panther Creek (Figure 2-9). Construction would entail vegetation clearing within the footprint of the holding ponds. This loss of vegetation is not expected to affect riparian function because existing vegetation in the affected area is distant from the stream and is sparse and short in stature (primarily managed herbaceous species), due to prior development of the USFS Cobalt Work Center. Construction of the holding ponds would follow BMPs, such as use of silt fences, to avoid impacts on aquatic habitat. A spill containment plan, invasive species control plan and erosion control plan for all areas disturbed by construction activities would be prepared and implemented to ensure **low** impacts on the aquatic environment.

*Egg Collection and Preparation Structures*

A three-sided structure would be built adjacent to the adult holding ponds for collecting eggs from adult fish, and a fully enclosed metal-sided one-story structure would be built for egg preparation (Figure 2-9). Clearing for these structures would entail vegetation removal. The loss of vegetation is not expected to affect riparian function because it is distant from the stream, and the existing vegetation in the affected area is sparse and short in stature (primarily managed herbaceous species). Construction of the egg collection and preparation facilities would have a **low** impact on fish.

*Chemical Storage Shed*

A 10-foot by 20-foot chemical storage building would be installed adjacent to the fish holding ponds to hold formalin, which would be used as a disinfectant. The formalin would be pumped via underground pipes from barrels in the chemical storage shed approximately 35 feet to the water supply in the post-sort holding ponds. The chemical storage shed would be a pre-manufactured shed specific to the purpose of chemical storage, and would be designed to contain accidental spills. The shed would hold at least one operating season's quantity of formalin (two 55-gallon barrels), as well as the pumping and distribution piping. At the end of each season, the storage containers and any excess formalin would be removed and inspected prior to the next season's use. A spill containment plan and an erosion control plan would be prepared and implemented. With these precautions, there would be **low** impacts on the aquatic environment and fishes.

*Panther Creek Facility Access Road*

The existing access roads to the facility are gravel surfaced and would be resurfaced with gravel. **No** impact on fish or their aquatic habitat would occur through resurfacing of gravel access roads because they are outside of the riparian area.

While there may be some minor, short-term, and localized impacts due to the construction of the Panther Creek weir facility, construction during the in-water work window, construction BMPs, and turbidity monitoring would be implemented to ensure effects on aquatic species and their environment are minimized. Therefore, impacts on fish would be **low**.

***Operational Impacts***

*Surface Water Withdrawal and Fish Habitat*

The Tribes would obtain a non-consumptive water right from the Idaho Department of Water Resources to operate the Panther Creek weir facility. The water would flow through the facility back to the river without loss. The distance between the intake and the discharge through the fish ladder would be approximately 700 feet.

The Panther Creek weir facility would require a non-consumptive diversion of water for the acclimation ponds, used in April and May, and for the adult holding facilities, used from June to September. To service the acclimation ponds, approximately 3 cfs of Panther Creek water would be diverted in April and May. During those months, Panther Creek mean monthly discharges would range from 131 to 381 cfs (USGS 2015b); thus, the diversion would reduce flows in the affected reach of Panther Creek by up to 2%. To service the adult holding facilities, approximately 10 cfs of Panther Creek water would be diverted between June and September. During those months, Panther Creek mean monthly discharges would range from 197 to 37 cfs (USGS 2015b); thus, diversion would reduce flows in the affected reach of Panther Creek by up to 27% in September. Earlier in the summer, when flows are higher, the flow reduction would be proportionally smaller. The diverted water would be returned to the river via the fish ladder approximately 700 feet downstream from the intake.

The proposed flow reduction represents a small to moderate reduction in habitat available to fish between the intake and the outfall, and is a proportionally small reduction compared to the flow changes that occur over the course of the summer, or on a year-to-year basis. There is ample habitat for spawning and rearing upstream as well as downstream of the site, so the percentage reduction in habitat within a 700-foot length of the river would be small in proportion to the habitat available in the basin as a whole, and is not of exceptional value relative to adjacent upstream and downstream reaches of the stream. These small reductions in the proportion of available flow between the intake and fish ladder are not sufficient to produce an impediment to migrating fish. Non-target fish (e.g. bull trout) entering the fish ladder would be released upstream of the weir, but would be subject to stress as a result of the associated handling.

The proposed Panther Creek weir facility could also divert up to 1 cfs of water from Dummy Creek if approved. Dummy Creek is a cold, spring-fed stream, and this water would be diverted to achieve lower water temperatures in the adult Chinook salmon holding tanks at the facility. The diversion of Dummy Creek would only occur if water temperatures in water diverted from Panther Creek were to exceed 62 degrees Fahrenheit. Use of an additional cold water source to cool water in the holding ponds in late summer would reduce the potential for infections in the held fish, reducing the need for periodic formalin treatments. The Tribes would consult with the IDEQ and USFS on the need and availability of Dummy Creek water each season. The Dummy Creek drainage is rather steep and short and does not likely provide much habitat for fish; thus, the short-term (several weeks) use of some of the flow during late summer would have a **low** impact on fish habitat in the basin.

*Facility Discharges*

Because fish rearing would take place at the proposed Crystal Springs hatchery and acclimating juveniles would be held, without feeding, for only short durations at the Panther Creek weir facility, wastes produced by acclimating juveniles are not likely to result in adverse impacts on water quality and would have **low** impact on fish or their habitat.

Adults would be held at the Panther Creek weir facility through summer until they are mature and ready to spawn in the fall. Adult salmonids do not feed once they have entered freshwater on their spawning migration, so waste production from these fish would be negligible. Formalin is the only chemical that may be used to treat fish in the adult holding ponds. Formalin would be periodically applied as a disinfectant to minimize the risks of disease outbreaks that could lead to increased mortality. This use would typically only occur if water temperatures became high enough to cause increased risk of disease activity and transmission. Use of formalin 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 treatment chemicals. The Tribes would be required to monitor the discharges under the NPDES permit and ensure and demonstrate that the discharge complied with 1 part per million or less formalin in the discharge. As described in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, Section 3.5.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, i.e., environmental consequences for the Panther Creek weir facility, the formalin treatments proposed would result in 1 part per million of formalin in the discharge, which is the most conservative concentration for protection of aquatic life (FDA 1995). In consideration of this practice, formalin use may have **low** impacts on fish or their habitat in Panther Creek.

*Broodstock Collection*

The Panther Creek fish trapping facilities would be operated from July to September each year to collect spring/summer-run Chinook salmon for the Hatchery Program. The weir would direct fish to the fish ladder and to the sorting and holding facilities. In the sorting pond, fish would be sorted, and non-target fish, such as bull trout, steelhead, and other game and non-game fish would be released upstream of the weir. In addition, if bull trout were observed congregating above or below the weir, some of the weir pickets would be temporarily rotated out of the water to allow passage by the fish.

Operation of a weir can lead to delay in both upstream and downstream migration of fish. Consequences of migration delay can vary depending on the site-specific conditions and context. Extended migration delay lasting more than 24 hours or delay during periods when temperature and habitat conditions are unfavorable can have a number of adverse effects on salmonids (McCullough 1999; Goniea et al. 2006; Bjornn and Reiser 1991). Delayed migration in high-current areas can increase energy expenditure, reducing energy reserves necessary for successful spawning. Delay during periods with elevated water temperatures can increase exposure to unfavorable temperature conditions, resulting in reduced survival and fitness. Migration delay in locations without suitable cover can expose migrating fish to predation and poaching mortality (Cuenco and McCullough 1996; McCullough et al. 2001).

Because collection activities could affect ESA-listed species, BPA is consulting on the effects of the Hatchery Program with USFWS (bull trout) and NMFS (Chinook salmon and steelhead). To ensure that potential effects on ESA-listed fish species are minimized, including impacts from broodstock collection, the Tribes would implement the avoidance, minimization, and mitigation measures identified by USFWS and NMFS during these consultations. These measures would include, but are not limited to, limiting the duration and frequency of collection activities to avoid and minimize migration delays, and adopting procedures intended to minimize stress and injury from handling and release after inadvertent capture in trap facilities. Because of these actions, the potential for impacts of the collection activities would be **low**.

### Impacts of Increased Numbers of Spring/Summer-Run Chinook Salmon

The increased abundance of spring/summer-run Chinook salmon in Panther Creek may impact both juvenile and adult life stages of naturally-spawned fish.

With the release of hatchery-reared juvenile Chinook salmon in Panther Creek, there is potential for competition, predation, and premature emigration when the progeny of naturally-spawning hatchery fish and hatchery releases share juvenile-rearing areas. A general discussion of potential effects of the release of hatchery-origin Chinook salmon is provided above for the Yankee Fork weir facility.

Ultimately, under the proposed production option or the 50% production option, the goal of the overall Hatchery Program, and the Panther Creek weir facility in particular, is to achieve 1,300 adult spring/summer-run Chinook salmon returning to the Panther Creek drainage to spawn each year, of which 800 would be taken for harvest by the Tribes and 500 would be left to spawn naturally in the system. This goal would help meet salmon recovery goals and the Tribes harvest needs.

The timing of bull trout and spring/summer-run Chinook salmon spawning in Panther Creek basin overlaps almost completely, and there is the potential for partial overlap in spawning habitat selection. Although there is currently little spatial overlap between spring/summer-run Chinook salmon and bull trout spawning in the Panther Creek basin because of microhabitat selection, there is a greater chance for overlap as numbers of spawning spring/summer-run Chinook salmon increase. This could result in adverse effects on bull trout because adult spring/summer-run Chinook salmon have a size-based competitive advantage over adult bull trout. This allows spring/summer-run Chinook salmon to out-compete bull trout for spawning sites, limiting the amount of spawning habitat available. Spring/summer-run Chinook salmon are also capable of displacing bull trout and superimposing their own redds on bull trout redds, resulting in the exposure and death of bull trout eggs. Where overlap occurs between spring/summer-run Chinook salmon and bull trout, juvenile bull trout are often larger than juvenile spring/summer-run Chinook salmon and have a clear competitive advantage (Young 2004). This size difference is sufficiently large that bull trout have been observed feeding on juvenile spring/summer-run Chinook salmon. Additionally, Underwood et al. (1995) found no evidence of substantial competition for rearing habitat between Chinook salmon and bull trout in several southwest Washington streams. The two species used dissimilar microhabitats, and microhabitat use by each species was the same among streams. Therefore, due to this temporal and spatial separation in habitat use, increased numbers of spring Chinook salmon in the basin are expected to result in **low** impacts on bull trout and other fish species.

#### Genetic Effects

Interbreeding between fish of different origins can result in negative genetic effects. For example, the interbreeding between hatchery-origin fish and native fish of the same species can result in impairment or loss of the characteristics in a native population that allow it to adapt to the local environment. This effect can occur when introduced fish stray into adjacent systems occupied by different ESUs of the same species.

A general discussion of potential effects of the release of hatchery-origin Chinook salmon on fish genetics is provided above for the Yankee Fork weir facility.

Though the Panther Creek population was considered extirpated by the Interior Columbia Basin Technical Recovery Team (ICBTRT 2007), Panther Creek is within the historical range of the Snake River spring/summer-run Chinook salmon ESU and was included in the listing (70 FR 37160).

There is a potential that, as the numbers of Chinook salmon returning to spawn increase, fish could stray into adjacent river basins inhabited by different spring-run Chinook salmon populations such as the Snake River spring/summer-run Chinook salmon ESU, a distinct population listed under the ESA as threatened. The potential for straying is inherent among anadromous fish because it provides an adaptive mechanism ensuring that suitable habitat is colonized soon after it becomes available, and because environmental factors such as river flows, passage conditions, and temperature can affect fish migration, causing fish to end up spawning in areas other than their natal stream. In Panther Creek, Chinook salmon from other adjacent areas have begun to use the habitat and establish a population there. Because the Panther Creek Chinook salmon program is designed to be integrated with any population that is established, some of the adaptations developing in Panther Creek should be maintained.

Under Alternative 1, the potential for straying would likely be lower than under existing conditions, because broodstock and adults would be collected from within the Panther Creek basin and smolts would be released in the basin. These fish would be imprinted to waters of the basin and would be drawn to return to the same general area. In the initial stages of the Hatchery Program, broodstock and adults may continue to be supplemented from the Pahsimeroi Hatchery if local returns are insufficient to meet production goals. However, fewer fish would come from out of the basin compared to the existing program.

As the Hatchery Program develops a locally-adapted population, any initial risk of straying is expected to decrease substantially. BPA is consulting with NMFS on this issue (as well as on other potential effects on ESA-listed fish under NMFS jurisdiction), and as part of that process is submitting a HGMP to the agency (Shoshone-Bannock Tribes 2013b). The Tribes would manage spawning interaction (in the hatchery and in the wild) so that genetic influences from hatchery production are balanced with demographic risk of extinction of the population. To accomplish this, the HGMP includes guidance for the proportion of hatchery and natural fish that would be used in broodstock as well as those allowed to spawn in the wild based on natural-origin returns. In addition, the HGMP included plans to keep straying at levels of less than 5% of total spawning returns, a benchmark value established to minimize potential genetic impacts of potential intermixing (HSRG 2009). The Tribes would tag and mark all hatchery-origin fish released in the basin, allowing for monitoring of straying rates. In the event that straying rates exceed acceptable thresholds, the Tribes would implement the following measures to reduce the number of strays:

- Reduce hatchery production to decrease the total number of hatchery-origin adults.
- Target harvests to decrease the number of hatchery-origin adults returning to the basin.
- Trap and remove hatchery-origin fish before they reach spawning areas.

For these reasons, genetic impacts of the Hatchery Program on other fishes would be **low**.

#### Wild and Scenic Rivers Act

As described above, effects on the fish ORV would occur during construction of the weir facilities; however, these effects would be temporary and localized. Operational effects would occur while the weirs were in use. However, this proposed Hatchery Program is intended to be temporary until fish runs are restored. Temporary in this context may mean many decades, but the intention is that these artificial means of re-establishing and supporting fish runs would ultimately become unnecessary as native and naturalized populations provide all the reproduction and escapement necessary to maintain populations at historic and desired levels. Beneficial effects would include the restoration of threatened Chinook salmon runs sufficient to support Tribal and recreational fishing, strengthening the river's eligibility for future Wild and Scenic Rivers Act designation.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, impacts on fish from construction of the proposed hatchery would be the same as those described above for full production under Alternative 1. The hatchery facility would still be built as proposed, and construction discharges would have similar potential effects on the environment as described above. These impacts would be **low**.

Because production of Chinook salmon would be reduced under the 50% production option, operational impacts (e.g., water use and discharges, ecological and genetic effects) would also be reduced, but would likely not differ substantially relative to impacts identified for Alternative 1 with the full production of Chinook salmon. The majority of water used (both volume and duration) and discharged during production of Chinook salmon is related to rearing juveniles at Crystal Springs hatchery. These discharges would have **low** impacts on fish.

The ecological and genetic impacts to juvenile and adult life stages of naturally-spawned fish would include effects from competition for spawning sites and redd superimposition, contributions to marine-derived nutrients, and the removal of fine sediments from spawning gravel. Under the 50% production option, these impacts may occur, but would be less than under the full production option because of the release of fewer hatchery-origin fish, resulting in **low** impacts on fish.

While genetic impacts would be similar as those listed under Alternative 1, because production of Chinook salmon would be reduced under the 50% production option, the genetic impacts would also be reduced. The ability to locally adapt a hatchery broodstock may be limited, due to reduced hatchery returns. The number of hatchery fish contributing to production in the wild would be reduced, and impacts from straying would also be reduced, resulting in **low** impacts on other fish.

#### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, construction-related impacts on fish would also be the same. Diverting water to isolate in-channel work areas would only occur during in-water construction windows for the protection of salmonids, and would result in a **low**, temporary impact. In addition, handling fish caught and passed at the weir facilities would have **low** impacts on fish.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, broodstock collection and smolt acclimation use small quantities of surface water, and flow requirements for holding fish at the weir facilities would be minimal. As a result, impacts on fish related to water use and discharge for the reduced production option would be **low**. Additionally, under the reduced production option, competition and predation risks with hatchery-origin Chinook salmon and steelhead would decrease, which would be a **low** impact.

#### Tribal and Recreational Harvest of Fish

The decreased production of Chinook salmon would reduce the beneficial effects of Tribal and recreational harvest, and decrease benefits to the viability of natural-origin Chinook salmon from integrated hatchery programs. In addition, decreased production of Chinook salmon would result in fewer fish carcasses available to provide moderate marine-derived nutrient benefits in watersheds to be stocked. Yellowstone cutthroat trout production at the Crystal Springs hatchery would remain the same as described above for full production under Alternative 1.

The Hatchery Program Master Plan (Shoshone-Bannock Tribes 2011) considered reduced production options for both Yankee Fork and Panther Creek that would focus on meeting specific Hatchery Scientific Review Group conservation criteria. Modeling of these options suggested that the lower production numbers required to meet the conservation criteria would not provide enough returning adults to support both a naturally spawning population and provide sufficient hatchery broodstock to meet the Tribal harvest program objectives (Shoshone-Bannock Tribes 2011). Therefore, these options were not selected for further analysis during the Master Planning process because they would not meet the Tribes' harvest and cultural goals. Further, the options would not meet NMFS' purpose and need to ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon because the natural-origin abundance would be reduced by taking broodstock from lower adult returns.

Under the 50% production option, the fish ORV in Yankee Fork and Panther Creek would be affected by a potential increase of fish from the Hatchery Program to meet production goals. The expected increase in the number of threatened Chinook salmon would be delayed, potentially diminishing Tribal and recreational fishing opportunities.

## 3.7.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts on fish at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

Under Alternative 2, the permanent Yankee Fork weir and associated facilities would not be constructed and no construction-related impacts on fish or fish habitat would occur at the site. Broodstock for the Hatchery Program would be collected using temporary weir and trap structures seasonally installed and removed at the Pole Flat Campground. The installation of the temporary weir would have **low** impacts on the aquatic habitat of fish, as it is installed by hand.

Like Alternative 1, the existing juvenile acclimation ponds would be used with the same potential impacts (i.e., **low**). Unlike Alternative 1, there would be no adult holding facilities, and thus there would be no use of therapeutic chemicals and no potential for associated water quality effects.

The operation of the temporary weir would have similar impacts as described in Section 3.7.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, for the permanent Yankee Fork weir facility with regard to the potential for migration delays of fish. As with operation under Alternative 1, the Tribes would release captured non-target fish above the weir. Further, if bull trout or other species were observed congregating above or below the weir, some of the weir pickets would be temporarily removed to facilitate free movement of the fish past the weir.

#### Wild and Scenic Rivers Act

Under Alternative 2, the effects on the fish ORV would be similar to those described under Alternative 1. Effects during construction of the weir facilities would be temporary and localized. Operational effects would occur while the weirs were in use; however, this proposed Hatchery Program is intended to be temporary until fish runs are restored. Beneficial effects would include the restoration of threatened Chinook salmon runs sufficient to support Tribal and recreational fishing, strengthening the river's eligibility for future Wild and Scenic Rivers Act designation. Alternative 2 would not affect the fish ORV to a degree that would impact Yankee Fork's continued eligibility as a Recreation Wild and Scenic River.

## Panther Creek Weir Facility

Under Alternative 2, the permanent Panther Creek weir facility would not be constructed and no construction-related impacts on fish or fish habitat would occur at the site. Under this alternative, the Tribes would request a special use permit from USFS for the operation of a temporary weir. If a temporary weir is permitted, the impacts on fish would be very similar to those discussed above for the Yankee Fork weir facility. The adults would be captured, moved to a tank truck, and delivered to the proposed Crystal Springs hatchery. No Panther or Dummy Creek waters would be diverted or used, and no discharge would be present. There would be minimal effects on habitat or water quality under Alternative 2.

As with Alternative 1, should the program of collection and reintroduction of Chinook salmon occur in Panther Creek, the released fish could compete with native stocks and other species within the basin. As noted in the Yankee Fork discussion (see the environmental consequences discussion presented above for the Yankee Fork weir facility), Chinook salmon would result in **low** impacts on other species.

As for effects on other ESU of Chinook salmon from straying, similar to Alternative 1, because the fish are captured and released in the target basin, straying to other drainages would be minimized.

### Wild and Scenic Rivers Act

Under Alternative 2, the effects on the fish ORV would be similar under to those described under Alternative 1. Effects during construction of the weir facilities would be temporary and localized. Operational effects would occur while the weirs were in use, however, this proposed Hatchery Program is intended to be temporary until fish runs are restored. Beneficial effects would include the restoration of threatened Chinook runs sufficient to support Tribal and recreational fishing, strengthening the river's eligibility for future Wild and Scenic Rivers Act designation. Alternative 2 would not affect the fish ORV to a degree that would impact Panther Creek's continued eligibility as a Recreation Wild and Scenic River.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for the full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weir at the Yankee Fork and Panther Creek sites. As a result, there would be **low** construction impacts on fish.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Handling fish caught and passed at the weir facilities would have **low** impacts on fish. Additionally, under the reduced production option, competition and predation risks with hatchery-origin Chinook salmon and steelhead would decrease, which would be a **low** impact.

#### Tribal and Recreational Harvest of Fish

The decreased production of Chinook salmon would reduce the beneficial effects of Tribal and recreational harvest, and decrease benefits to the viability of natural-origin Chinook salmon from integrated hatchery programs. In addition, decreased production of Chinook salmon would result in fewer fish carcasses available to provide moderate marine-derived nutrient benefits in watersheds to be stocked. Yellowstone cutthroat trout production at the Crystal Springs hatchery would remain the same as described above for full production under Alternative 1.

The Hatchery Program Master Plan (Shoshone-Bannock Tribes 2011) considered reduced production options for both Yankee Fork and Panther Creek that would focus on meeting specific Hatchery Scientific Review Group conservation criteria. Modeling of these options suggested that the lower production numbers required to meet the conservation criteria would not provide enough returning adults to support both a naturally spawning population and provide sufficient hatchery broodstock to meet the Tribal harvest program objectives (Shoshone-Bannock Tribes 2011). Therefore, these options were not selected for further analysis during the Master Planning process because they would not meet the Tribes' harvest and cultural goals. Further, the options would not meet NMFS' purpose and need to ensure the sustainability and recovery of Snake River spring/summer-run Chinook salmon because the natural-origin abundance would be reduced by taking broodstock from lower adult returns.

Under the 50% production option, the fish ORV in Yankee Fork and Panther Creek would be affected by a potential increase of fish from the Hatchery Program to meet production goals. The expected increase in the number of threatened Chinook salmon would be delayed, potentially diminishing Tribal and recreational fishing opportunities.

# 3.7.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on fish during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites. Water quality mitigation cited below can be found in Section 3.5, *Groundwater and Surface Water Quality and Quantity.*

## 3.7.3.1 Alternative 1

### Construction

#### Crystal Springs Hatchery Site

Water quality mitigation measures to protect fish during construction would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Crystal Springs hatchery site under Alternative 1. No other mitigation would be required.

#### Yankee Fork and Panther Creek Weir Facilities

Water quality mitigation measures to protect fish during construction would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Yankee Fork and Panther Creek weir facilities under Alternative 1. Additional mitigation would include implementation and compliance with a NMFS-approved fish salvage and relocation plan. In-water construction would also occur within approved in-water work windows.

### Operations

#### Crystal Springs Hatchery Site

Water quality mitigation measures to protect fish during hatchery operations would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Crystal Springs hatchery site under Alternative 1. No other mitigation would be required.

#### Yankee Fork and Panther Creek Weir Facilities

Water quality mitigation measures to protect fish during weir facility operations would be the same measures as those cited in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for the Yankee Fork and Panther Creek weir facilities under Alternative 1.

Additional mitigation would include implementation and compliance with a NMFS-approved fish handling plan during operation. The Tribes would also operate under the annual Idaho Scientific Collection permits and authorization under the ESA by the NMFS for the weir facilities.

Daily monitoring for bull trout congregating above and below the weirs would be conducted daily by the Tribes. If congregations are evident, a section of the weir would be opened to facilitate migration through the weir facility.

If formalin treatments are necessary, the discharge would be managed to ensure 1 milligram per liter or less would be discharged to Yankee Fork or Panther Creek.

## 3.7.3.2 Alternative 2

### Construction

#### Crystal Springs Hatchery Site

The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended.

### Operations

#### Crystal Springs Hatchery Site

The same mitigation measures recommended for Alternative 1 operations at the Crystal Springs hatchery would also be implemented under Alternative 2.

#### Yankee Fork and Panther Creek Weir Facilities

No mitigation is recommended; however, the Tribes would implement and comply with NMFS-approved fish handling plans, as well as comply with the annual Idaho Scientific Collection permits and authorization under the ESA by the NMFS for the weir facilities.  Captured fish would be transported by truck from the weir facilities, and no holding or acclimation would be required at the Yankee Fork and Panther Creek sites.

## 3.7.4 No Action Alternative

Under the No Action Alternative, the Crystal Springs hatchery facility would not be constructed and no impacts on fish or fish habitat would occur at the site, in McTucker Creek, or on American Falls Reservoir.  Hatchery-raised Chinook salmon would not be released to Yankee Fork or Panther Creek nor would Yellowstone cutthroat trout be released to Fort Hall Bottoms.  Thus, **no** intra- or interspecies impacts would occur.  Under the No Action Alternative, the harvest and cultural benefits of this proposed Hatchery Program, including providing enough returning fish to meet Tribal harvest program objectives and support a naturally spawning population of Chinook salmon in the Yankee Fork and Panther Creek, and providing a harvestable Yellowstone cutthroat trout population in the Fort Hall Bottoms, would not occur.  Overall, there would be **no** impacts compared to baseline conditions before the temporary weirs were installed in the Yankee Fork, but it could reduce the number of Chinook salmon returning as a result of the trapping and smolt releases under the current conditions (with the temporary weir).  There would be **no** impact on Panther Creek from existing conditions in Panther Creek.  For both the Yankee Fork and Panther Creek weir facilities, the No Action Alternative would impact the opportunity to improve harvest and cultural goals of the Hatchery Program.

# 3.8 Wildlife

This section describes the affected environment and environmental consequences, including mitigation measures, associated with wildlife, resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). The wildlife analysis also considers the following:

- Two Chinook salmon production level options: the proposed production level (up to 1 million smolts) and a 50% production level.
- The federal Wild and Scenic Rivers Analysis presented in Appendix D for the wildlife outstandingly remarkable value (ORV), which is considered in the affected environment and the environmental consequences analysis of wildlife at the Panther Creek weir facility.

The analysis focuses on the following special-status wildlife species:

- Species listed as candidate, proposed, threatened, or endangered under the Endangered Species Act (ESA) and associated designated critical habitat.
- Species protected under the Bald and Golden Eagle Protection Act.
- Species covered under the Migratory Bird Treaty Act.
- Species of Greatest Conservation Need identified in Idaho's Comprehensive Wildlife Conservation Strategy (IDFG 2005).

In addition, for the Yankee Fork and Panther Creek weir facilities, the following Forest Service species lists were evaluated:

- U.S. Forest Service (USFS) Region 4 Sensitive Species (USFS 2013b).
- USFS Salmon-Challis National Forest management indicator species

Unless otherwise cited, information on habitats and location records was obtained from the Idaho Fish and Wildlife Information System (IDFG 2015d) and the Atlas of Idaho's Wildlife (Groves et al. 1997). Habitat conditions are based on evaluation of aerial photographs, regional vegetation surveys (IDFG 2005) and on a reconnaissance-level vegetative survey conducted at each site in June 2014 (ICF 2014).

## 3.8.1 Affected Environment

The wildlife analysis focuses on areas proposed for ground-disturbing activities at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility.

Wildlife use of adjacent lands was also considered for analysis. While the focus for ground-disturbing impacts was on lands immediately adjacent to proposed sites, an analysis area including all lands within a 1-mile radius from proposed activities was considered. This distance is based on a construction sound evaluation conducted for a recent hatchery construction project, which found that typical construction sounds are above rural background sound levels for about 1 mile from the source (BPA 2011).

Based on findings presented in the Section 3.5, *Groundwater and Surface Water Quality and Quantity*, and Section 3.6, *Wetlands and Floodplains*, changes in water quality and water flows and associated effects on downstream vegetation are expected to be low. Therefore, the wildlife impact analysis area considers downstream areas only for potential disturbance, rather than habitat-based impacts.

### 3.8.1.1 Crystal Springs Hatchery Site

#### Landscape Setting

The proposed Crystal Springs hatchery site is located between extensive riparian areas to the south and extensive irrigated agricultural lands to the north. Because of this, species from both types of habitats are likely to occur within the analysis area for the Crystal Springs hatchery.

Wetlands on the proposed hatchery site flow into an approximately 60-square-mile complex of meandering sloughs and wetlands located at the northeastern end of American Falls Reservoir. Therefore, the wetland complex may be used as part of much larger territories by aquatic and riparian species, including mink (*Neovison vison*), river otter (*Lutra canadensis*), muskrat (*Ondatra zibethicus*), beaver (*Castor canadensis*), belted kingfisher (*Ceryle alcyon*), great blue heron (*Ardea herodias*), and bald eagle (*Haliaetus leucocephalus*) (IDFG 2015d).

Wildlife species likely to occur on the predominately agricultural upland landscape in the Crystal Springs analysis area include coyote (*Canis latrans*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), ring-necked pheasant (*Phasianus colchicus*), western kingbird (*Tyrannus verticalis*), mourning dove (*Zenaida macroura*), black-billed magpie (*Pica hudsonia*), barn swallow (*Hirundo rustica*), horned lark (*Eremophila alpestris*), brown-headed cowbird, (*Molothrus ater*), American crow (*Corvus brachyrhynchos*), and common raven (*Corvus corax*) (Groves et. al 1997).

#### On-Site Habitats in the Crystal Springs Analysis Area

The site was previously developed as a trout hatchery but has been abandoned for years, and shrubs and trees have grown in places to provide habitat for several types of wildlife. In addition, ponds and springs associated with the abandoned hatchery have developed into relatively high-quality wetland wildlife habitat in terms of vegetative structure.

Wildlife habitats in the Crystal Springs analysis area can be classified into four distinct types:

- Open disturbed grassland in the northwest portion of the site (classified as disturbed grassland, bunchgrass grassland, and weedy forb in Section 3.4, *Vegetation*).
- Mixed shrub in the central portion of the site (classified as big sagebrush mixed woodland and Russian olive woodland in Section 3.4, *Vegetation*).
- A pond/wetland complex in the eastern portion of the site.
- Built features, including abandoned raceways and hatchery building.

The following sections describe wildlife use within each of these habitat types.

##### Disturbed Grassland

This habitat type is essentially an extension of the surrounding agricultural lands. Due to low overall structure and vegetation diversity, disturbed grassland is relatively poor wildlife habitat, though it is likely used by small mammals and as open foraging habitat by hawks, owls, crows and ravens, and aerial foraging birds, such as swallows.

#### Mixed Shrub

The shrubby habitat on the central portion of the proposed hatchery site provides cover and foraging areas for many types of wildlife, including mule deer (*Odocoileus hemionus*); upland game birds such as gray partridge (*Perdix perdix*), chukar (*Alectoris chukar*), and ring-necked pheasant; and small mammals, such as black-tailed jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus nuttallii*), montane vole (*Microtus montanus*), and deer mouse (*Peromyscus maniculatus*).

These species may attract predators such as coyote, bobcat (*Felis rufus*), western spotted skunk (*Spilogale gracilis*), American badger (*Taxidea taxus*), raccoon (*Procyon lotor*), and red fox (*Vulpes vulpes*). Habitat is suitable for several species of reptiles, including western rattlesnake (*Crotalus viridis*), western terrestrial garter snake (*Thamnophis elegans*), and gopher snake (*Pituophis catenifer*).

The shrubby habitat may also be used by shrub-nesting birds, such as yellow-breasted chat (*Icteria virens*), lark sparrow (*Chondestes grammacus*), Brewer's sparrow (*Spizella breweri*), vesper sparrow (*Pooecetes gramineus*), and American robin (*Turdus migratorius*).

While the habitat contains many weedy, non-native species, it may still support some sage-dependent wildlife species whose populations have declined along with sagebrush habitat, including sage thrasher (*Oreoscoptes montanus*) and sage sparrow (*Amphispiza belli*).

The Crystal Springs analysis area contains potentially suitable nesting habitat for hawks and owls, including burrowing owl (*Athene cunicularia*), northern harrier (*Circus cyaneus*), and red-tailed hawk (*Buteo jamaicensis*). While no such nests were observed during site visits, and trees are generally smaller than typically used for nesting hawks and owls, the site has not been formally surveyed for nesting birds, including raptors.

#### Pond/Wetland

The pond/wetland complex on the eastern edge of the Crystal Springs analysis area likely supports a wide range of riparian species, including species previously mentioned as associated with the riparian areas to the south, as well as amphibians such as long-toed salamander (*Ambystoma macrodactylum*), Pacific chorus frog (*Pseudacris regilla*), western toad (*Bufo boreas*), and northern leopard frog (*Rana pipiens*).

A wide range of bats may also forage over the wetland area and adjacent upland habitats, including the widespread and common little brown myotis (*Myotis lucifugus*). The wetlands may also be used by less common species of bat such as Yuma myotis (*Myotis yumanensis*).

#### Built Features

In addition to the three main habitat types, past use of the site as a fish hatchery could have created underground spaces (e.g., under a slab or pile of broken concrete) that could be used by burrowing mammals, such as northern pocket gopher (*Thomomys talpoides*) and yellow-bellied marmot (*Marmota flaviventris*). These burrows, once abandoned, could in turn be used as communal wintering areas for snakes (called hibernacula) or potentially as nest sites for burrowing owls. The foundation of an abandoned hatchery building could support such uses. In addition, both the interior and exterior of the abandoned building could be used for roosting by bats and by nesting barn swallows and as resting habitat for bushy-tailed woodrat (*Neotoma cinerea*), common porcupine (*Erethizon dorsatum*), and striped skunk (*Mephitis mephitis*).

## Special-Status Species

### Endangered Species Act Species

The western yellow-billed cuckoo (*Coccyzus americanus*) is the only wildlife species protected under the ESA known to occur within the Crystal Springs analysis area. In the vicinity of the proposed hatchery, the species is associated with riparian woodlands located along a 22-mile long segment of the Snake River corridor from American Falls Reservoir to the town of Blackfoot. The proposed hatchery is approximately 1 mile from the closest designated habitat and 0.6 mile from the nearest sighting record (IDFG 2015d).

Because yellow-billed cuckoo habitat and known populations are present nearby, individuals may occasionally visit or travel through the Crystal Springs analysis area; however, the Crystal Springs analysis area does not contain typical habitat for this species, which consists of cottonwood riparian woodlands with a dense understory of willow and dogwood (Reynolds and Hinckley 2005).

A portion of the Crystal Springs analysis area, at distances from 0.25 to 1.0 miles south and east of the proposed hatchery site, has been proposed as critical habitat for the yellow-billed cuckoo (USFWS 2014).

### Bald and Golden Eagle Protection Act Species

The American bald eagle (*Haliaetus leucocephalus*) is a state-sensitive species that is also protected under the Bald and Golden Eagle Protection Act. Bald eagles are known to occur in the Crystal Springs analysis area and could occasionally forage on or near the hatchery site as part of much larger foraging areas. The Crystal Springs analysis area is also located within the range of golden eagle (*Aquila chrysaetos*), although there are no records of their occurrence in the vicinity of the Crystal Springs analysis area.

### Idaho Species of Greatest Conservation Need

Yellow-billed cuckoo and bald eagle (discussed above) are also on the Idaho Species of Greatest Conservation Need list. In addition, data from Idaho Fish and Game (IDFG) (IDFG 2015d) indicate eight records of Idaho Species of Greatest Conservation Need within the Crystal Springs analysis area (i.e., a 1-mile radius from the Crystal Springs hatchery site). They include four observations of yellow-billed cuckoo, three observations of trumpeter swan, and one observation of northern pintail. The ponds on the hatchery site provide potential habitat for trumpeter swan and northern pintail, but use is likely to be uncommon due to the small size of the ponds (Brown and Dinsmore 1986).

### Migratory Bird Treaty Act Species

Bird species potentially occurring in the vicinity of the Crystal Springs hatchery site are described above under *On-Site Habitats*. All of these species are protected under the Migratory Bird Treaty Act, as are the species listed above under *Idaho Species of Greatest Conservation Need.*

## 3.8.1.2 Yankee Fork Weir Facility

### Landscape Setting

The Yankee Fork weir facility is located in the Challis Volcanics ecological section of the Middle Rockies–Blue Mountains ecoregion, where wildlife habitats include subalpine forests on the ridges and dry coniferous forests and willow-riparian areas along the river bottoms (IDFG 2005).

Wildlife in this region of Idaho includes wide-ranging mammals, such as elk (*Cervus elaphus*), mule deer, bighorn sheep (*Ovis canadensis*), gray wolf (*Canis lupus*), fisher (*Martes pennanti*), wolverine (*Gulo gulo*), Canada lynx (*Lynx canadensis*), black bear (*Ursus americanus*), mountain lion (*Felis concolor*), bobcat, and coyote. Although these species have not been reported in the Yankee Fork analysis area, their occurrence in the area would not be unusual.

### On-Site Habitats

The Yankee Fork weir facility has been previously disturbed by mining, roads, and an adjacent campground and associated roads and turnouts. Due to the developed nature and relatively high level of human use, wide-ranging mammals, such as gray wolf, fisher, and mountain lion, are most likely to travel through this area or avoid it rather than regularly use the proposed weir site and surrounding areas.

General wildlife species reported in the Yankee Fork analysis area (IDFG 2015d) include the Yuma myotis bat, American pika (*Ochotona princeps*), red fox, red crossbill (*Loxia curvirostra*), Columbian ground squirrel (*Spermophilus columbianus*), and long-tailed vole (*Microtus longicaudus*).

Portions of the river within the Yankee Fork analysis area contain riparian habitat and adjacent upland shrub and forest areas. These riparian areas are likely used by a wide range of species associated with rivers, including osprey (*Pandion haliaetus*), great blue heron, mink, and water vole (*Microtus richardsoni*). The river and associated wetlands and side channels are likely used by amphibians, such as Pacific chorus frog, long-toed salamander, western toad, and Idaho giant salamander (*Dicamptodon aterrimus*). Birds that may use riparian areas include grouse (*Bonasa umbellus*), willow flycatcher, (*Empidonax traillii*), Wilson's warbler, (*Wilsonia pusilla*), and song sparrow (*Melospiza melodia*).

### Special-Status Species

#### Endangered Species Act Species

The Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of species protected under the ESA within the Yankee Fork analysis area. No designated critical habitat for wildlife species is present within the Yankee Fork analysis area (USFWS 2016b).

Wolverine has been proposed for listing as threatened. Due to the wide-ranging nature of the species, they may travel through and forage within the Yankee Fork analysis area. However, because wolverine is generally averse to human activity, any presence in the Yankee Fork analysis area is likely to be transitory. Human activities that occur under current conditions (primarily use of the road through the area) are likely to preclude regular use of the area by this species.

### Bald and Golden Eagle Protection Act Species

Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of eagle nest sites or communal roosts within the Yankee Fork analysis area.

### Idaho Species of Greatest Conservation Need

Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of Species of Greatest Conservation Need within the Yankee Fork analysis area.

### Migratory Bird Treaty Act Species

The high level of human activity and lack of large trees or dense vegetation likely precludes nesting by many migratory birds sensitive to human disturbance, such as hawks and owls. Common wildlife use in this area is expected to include bird species tolerant of human activities, such as gray jay (*Perisoreus canadensis*), Steller's jay (*Cyanocitta stelleri*), Clark's nutcracker (*Nucifraga columbiana*), and common raven.

A national breeding bird survey station (Sauer et al. 2014) is located at the campground adjacent to the proposed Yankee Fork weir facility, within the Yankee Fork analysis area, in an area of upland forest and shrubs. Species recorded at this site include warbling vireo (*Vireo gilvus*), yellow warbler (*Dendroica petechia*), western tanager (*Piranga ludoviciana*), ruby-crowned kinglet (*Regulus calendula*), American robin (*Turdus migratorius*), yellow-rumped warbler (*Dendroica coronata*), Swainson's thrush (*Catharus ustulatus*), chipping sparrow (*Spizella passerina*), and pileated woodpecker.

### USFS Region 4 Sensitive Species

No reports of USFS Region 4 Sensitive Species are documented within 5 miles of the Yankee Fork analysis area, although wolverine have been documented within 5 miles.

USFS Region 4 Sensitive Species potentially occurring in the Yankee Fork analysis area include bighorn sheep, three-toed woodpecker (*Picoides tridactylus*), and Columbia spotted frog (*Rana luteiventris*). Bighorn sheep may occur in the general area but are likely to be at higher elevations than those within the Yankee Fork analysis area. Three-toed woodpecker could forage in the area within riparian and upland shrub and forest habitats. The Yankee Fork and adjacent areas are within the range and provide suitable habitat for Columbia spotted frog.

### USFS Salmon-Challis National Forest Management Indicator Species

Salmon-Challis National Forest Management Indicator Species potentially present in the Yankee Fork analysis area include Columbia spotted frog and pileated woodpecker (*Dryocopus pileatus*).

The Columbia spotted frog is a Management Indicator Species for riparian habitats.

The pileated woodpecker is a Management Indicator Species for large and mature forests. The affected environment may include trees suitable for nesting. Pileated woodpeckers are likely to use burned areas, trees, and fallen logs in the Yankee Fork analysis area during wide-ranging foraging activities.

### 3.8.1.3 Panther Creek Weir Facility

#### Landscape Setting

The Panther Creek site is located in the same ecoregion as the Yankee Fork site (Middle Rockies–Blue Mountains ecoregion), and provides very similar wildlife habitats, including subalpine forests on the ridges and dry coniferous forests and willow-riparian areas along the river bottoms (IDFG 2005). Based on habitats, wildlife use at the landscape level is also likely to be similar to the Yankee Fork site, including many wide-ranging mammals, such as deer, elk, and black bear.

##### Wild and Scenic Rivers Act

Under the National Wild and Scenic River System, Panther Creek was considered as eligible under the "Recreation" classification for Wild and Scenic Rivers in 1993. Wildlife has been identified as one of its ORVs (Appendix D). Specific information concerning the wildlife ORV is limited; however, it is likely that this value would be based on something other than what can be found at the proposed Panther Creek site. For the purpose of this analysis, the value of wildlife was determined to be the abundance, diversity, and visibility of big game and other wildlife viewing opportunities along the river and it its surrounding areas, rather than the presence of unique species.

#### On-Site Habitats

As with the Yankee Fork site, the proposed Panther Creek site has been previously disturbed by road construction and the development of USFS facilities and associated access roads, parking areas, and landscaping.

The most notable wildlife habitat in the Panther Creek analysis area occurs along Panther Creek, where a 10- to 60-foot wide strip of shrub and forest riparian is situated between the creek and Panther Creek Road. This area of willows and mixed shrubs is likely used by many types of wildlife, such as great blue heron, aquatic mammals (e.g., mink, muskrat), raccoon, and numerous species of songbirds and amphibians. This habitat is also likely to support a wide range of insects and other invertebrates, which in turn provide food for larger wildlife.

The main area proposed for the adult holding facility contains a developed pasture area, which could be used as foraging habitat by wildlife species such as deer and elk, small mammals, amphibians, and predators such as hawks and owls.

#### Special-Status Species

##### Endangered Species Act Species

Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of wildlife species protected under the ESA in the Panther Creek analysis area. The Panther Creek analysis area contains no habitat designated as critical for threatened or endangered species (USFWS 2016b).

Wolverine, which has been proposed for listing as threatened, may travel through and forage within the Panther Creek analysis area. Wolverine is generally averse to human activity and any presence in the Panther Creek analysis area is likely to be transitory. Human activities that occur under current conditions (primarily use of the road through the area) are likely to preclude regular use of the area by this species.

### Bald and Golden Eagle Protection Act Species

Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of eagle nest sites or communal roosts within the Panther Creek analysis area.

### Idaho Species of Greatest Conservation Need

Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of Idaho Species of Greatest Conservation Need within the Panther Creek analysis area. However, harlequin ducks (*Histrionicus histrionicus*) were reported during the breeding season at a location slightly more than 1 mile north of the site in 2014 (IDFG 2015d). Panther Creek seems to provide suitable foraging and perhaps nesting habitat for harlequin ducks, and they may be present.

### Migratory Bird Treaty Act Species

All native bird species likely to be found in the analysis area, including all bird species named above, are protected under the Migratory Bird Treaty Act. The high level of human activity and lack of large trees or dense vegetation likely precludes nesting by many migratory birds sensitive to human disturbance, such as hawks and owls. Common wildlife use in this area is expected to include bird species tolerant of human activities, such as gray jay (*Perisoreus canadensis*), Steller's jay (*Cyanocitta stelleri*), Clark's nutcracker (*Nucifraga columbiana*), and common raven.

### USFS Region 4 Sensitive Species

Idaho Fish and Wildlife Information System (IDFG 2015d) contains no records of USFS Region 4 Sensitive Species within the Panther Creek analysis area. However, species recorded within 5 miles of proposed activities included several species on the USFS Region 4 list, including great gray owl (*Strix nebulosa*), Columbia spotted frog, and wolverine (wolverine has also been proposed as threatened under ESA). In addition, harlequin ducks are on the USFS Region 4 Sensitive Species list. Other USFS Region 4 Sensitive Species that could occur in the general vicinity of the proposed facility include gray wolf, fisher, and three-toed woodpecker.

### USFS Salmon-Challis National Forest Management Indicator Species

Mature standing and downed trees near the proposed Panther Creek weir facility provide habitat suitable for pileated woodpecker, a Management Indicator Species for mature forests. Riparian areas along the creek provide habitat suitable for Columbia spotted frog, a Management Indicator Species for riparian habitats.

## 3.8.2 Environmental Consequences

Table 3.8-1 summarizes the sources and types of impact on wildlife.

**Table 3.8-1. Potential Impacts on Wildlife**

| Timing | Source | Impact Type |
|---|---|---|
| Construction | Heavy equipment use, including clearing, grading, and excavating | Direct mortality<br>Habitat disturbance and destruction (some temporary)<br>Off-site disturbance |
| | Building of facilities | Off-site disturbance |
| | Traffic | Noise/disturbance<br>Roadway mortality |
| Operations | Physical presence of facilities and fencing | Wildlife movement disruption<br>Permanent habitat loss |
| | Human activity | Off-site disturbance |
| | Artificial lighting | Disturbance, attraction |
| | Water intake | Direct mortality of amphibians and their eggs |
| | Holding and acclimation ponds | Wildlife/human conflicts (attracting predators attempting to feed on fish) |
| | Placing of carcasses | Wildlife/human conflicts (attracting scavengers to areas used by people)<br>Food-web effects |

Several other potential sources of impacts on wildlife were considered but eliminated from detailed study based on interdisciplinary review of other resource topics.

- **Water/flow regimes.** Changes in water regimes from hatchery and weir operations may have minor downstream effects on aquatic ecology, but overall effects would be **low** (see Section 3.6, *Wetlands and Floodplains*).
- **Water quality.** Potential downstream effects of chemical use at the hatchery and weir sites are addressed by EPA and Idaho Department of Environmental Quality regulations and consequently have negligible potential to affect wildlife (see Chapter 2, *Alternatives Including the Proposed Action*, and Section 3.5, *Groundwater and Surface Water Quality and Quantity*).
- **Sport and Tribal fishing activities.** Increases in recreational and Tribal fisheries would occur within established fishing areas and would not result in new disturbances to wildlife habitats (see Section 3.1, *Land Use and Recreation*).
- **Ecosystem-level changes.** Chinook salmon produced at the hatchery would be part of an ecosystem that includes the Pacific Ocean and mouth of the Columbia River. For example, at the mouth of the Columbia River, outgoing smolts are fed upon by many types of birds, while returning adults are fed upon by seals and sea lions and, potentially, endangered Southern Resident killer whales. However, such wide-ranging impacts on wildlife are considered at a higher level of policy planning (NMFS 2014), and are not issues to be addressed in program-specific decisions. Therefore, these impacts are not addressed in this section.

### 3.8.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

The potential impacts of the construction and operation of the Crystal Springs hatchery on wildlife are discussed in the following sections. Because this facility would be built under both Alternative 1 and Alternative 2, these impacts would be the same for both alternatives.

**Construction Impacts**

***Clearing***

Initial clearing, grading, and excavating of the site would eliminate portions of the existing wildlife habitats described in Section 3.8.1, *Affected Environment*. Most wildlife would likely leave the site; however, smaller animals (e.g., snakes, mice) may be injured or killed during site clearing and grading.

Because initial site clearing would occur during the dry-season construction window (June through October), active nest and den sites and hibernating habitats for reptiles, amphibians, and small mammals would not be disturbed. Removal of inactive snake hibernacula, burrowing owl burrows, and stick nests used by hawks and owls could be removed during construction, and clearing of sagebrush would remove nesting habitat for several types of sparrows and other migratory birds.

Construction of the housing area would take place within disturbed grassland, where habitat values are low. Construction of the hatchery would remove approximately 7.22 acres of big sagebrush and disturbed grassland vegetation cover types, of which 3.19 acres would be permanently impacted and the remainder would be restored following construction. Removal of large sagebrush would eliminate existing habitat values for deer, upland game birds, nesting migratory birds, small mammals, predators, and snakes.

Because active nests or hibernacula would be avoided, and effects on both species and their habitat would be limited to common species situated at the construction site, the level of impact would be **low**.

***Noise[1]***

Construction noise could exceed background sound levels at distances of up to 1 mile. Common species on adjacent lands could be disturbed, though impacts would be short-term and localized. Disturbance from construction noise and activity could have minor effects on individuals by discouraging the use of areas near the site but would have **low** overall impacts on species distribution or abundance.

***Traffic***

Construction traffic to and from the site could disturb wildlife and cause direct mortality to species such as western terrestrial garter snake and western rattlesnake (*Crotalus viridis*). Since these species are common and the number killed would likely be low, the overall impact level would be **low**.

[1] An analysis of noise impacts on human use areas and human receptors is presented in Section 3.12, *Noise*. This section also details noise associated with construction and operations of the Hatchery Program on wildlife.

### ***Special Status Species***

*Endangered Species Act Species*

As described in Section 3.8.1, *Affected Environment*, the western yellow-billed cuckoo is the only ESA-listed threatened or endangered species that could be present in the Crystal Springs analysis area. Habitat on site is not suitable for nesting or foraging, but designated critical habitat occurs in portions of the Crystal Springs analysis area more than 0.25 mile south of the proposed construction site. Thus, impacts on this species during construction could be caused by noise effects. However, the species likely would not perceive activity at the construction site due to the flat terrain and masking effects of intervening vegetation; therefore, impacts would be **low**.

*Bald and Golden Eagle Protection Act Species*

As described in Section 3.8.1, *Affected Environment*, bald eagles may forage in the Crystal Springs analysis area. Habitat in the Crystal Springs analysis area is not suitable for nesting or roosting. Thus, impacts on this species during construction would be limited to incidental disturbance such as site avoidance by foraging birds, a **low** impact.

*Idaho Species of Greatest Conservation Need*

Idaho Species of Greatest Conservation Need recorded within the Crystal Springs analysis area include the yellow-billed cuckoo and bald eagle, as well as the trumpeter swan and northern pintail. The latter species forage on and near larger bodies of water such as are found near the western and southern limits of the Crystal Springs analysis area, which is where these species have been recorded. In these areas, they would be unlikely to perceive or respond to sound and activity associated with work at the construction site, resulting in **low to no** impact on Species of Greatest Conservation Need.

*Migratory Bird Treaty Act Species*

All bird species potentially occurring in the vicinity of the Crystal Springs hatchery site are protected under the Migratory Bird Treaty Act. Foraging and nesting by these species may be affected by clearing, noise, and activity associated with proposed hatchery construction. Habitat cleared during construction would remain unsuitable for use by most migratory birds, although some birds would nest and forage at the completed facility; for example, barn swallows often occupy hatchery buildings. Habitat in the Crystal Springs analysis area that is not cleared would be affected by noise associated with construction, and would likely experience some reduction in use by migratory birds for both nesting and foraging for the duration of construction, a **low** impact.

In summary, construction impacts would include vegetation clearing, noise, and road-related mortality. Construction timing and revegetation practices would serve to minimize the impacts of vegetation clearing on wildlife habitat. Few individuals of common wildlife species are likely to be affected by these impacts. Although some special status species have been recorded in the analysis area, the area where construction-related impacts could occur does not include habitat for these species, except a few migratory bird species that may nest at the hatchery site. Habitat in this area, however, is not scarce or of particularly high quality.

In consideration of these points, construction would result in **low** impacts on wildlife and their habitat.

#### Operational Impacts

Fencing around the pond area could potentially restrict wildlife movements to and from these relatively high-value habitats. However, fencing would not impede movements of small mammals, amphibians, and reptiles, and would have little effect on bird use.

Human activity and associated noise at the hatchery and residences could disturb wildlife on adjacent lands, but as the species affected are common and likely habituated to existing neighboring land uses such as agriculture, such impacts would be **low**.

Lighting at the facility could affect wildlife use in the immediate vicinity, including migrating birds, bats, and wildlife using on-site wetlands. Lighting would be directed downward and would be limited to the intensity required to perform nighttime operations. The scale and intensity of lighting would not be sufficient to significantly interfere with wildlife use of habitats in the vicinity or migratory bird movements through the area; therefore, the impact of lighting would be **low**.

Traffic to and from the site would continue to result in disturbance and occasional mortality, but due to the common nature of species affected, this impact would be **low**.

The smell of the hatchery and the holding ponds filled with fish could attract common scavengers and predators, including raccoon, river otter, coyote, osprey, and great blue heron. Hatchery managers would take preventative measures, including netting and hazing, to keep wildlife away from facilities and fish. Lethal control is not proposed. Such activities would have only temporary impacts on wildlife and would not be likely to significantly affect their ability to feed, breed, or seek shelter. Therefore, impacts would be **low**.

### Yankee Fork Weir Facility

#### Construction

##### *Habitat Clearing*

Clearing, excavation, and landscaping for the permanent Yankee Fork weir facility would directly remove wildlife habitats, including riparian, wetland, and upland shrub and forest habitats. As documented in Section 3.4, *Vegetation*, the majority of construction would occur in the upland shrub and developed cover types and therefore would affect relatively low-value wildlife habitat, and the level of impact would be **low**.

Construction would involve re-routing the main Yankee Fork channel during fall base flows via a temporary channel for approximately two weeks. While this may affect amphibians and aquatic invertebrates using this portion of the river, amphibian use of the main channel is likely low due to the high flow energy and low water temperatures in the stream, and the overall impact is expected to be **low** and temporary.

Approximately 0.33 acres of riparian vegetation would be removed for facilities and road relocation. This habitat loss would reduce foraging, cover, and breeding habitat for riparian birds, mammals, and amphibians. Due to the relatively small area affected, the overall impact would be **low**. Plantings in disturbed riparian areas would allow the gradual redevelopment of a riparian vegetation community, thus diminishing this impact over time. Several years would be required for complete revegetation.

Construction would avoid vegetation clearing prior to the spring breeding season (April 1 to July 15) to avoid disturbing active nests or den sites during construction. Most wildlife could thus leave the site during construction. Smaller animals that may be present on site throughout the year, such as amphibians and rodents, may be injured or killed during site clearing, grading, and dewatering, a **moderate** impact.

***Noise*[2]**

Noise from construction could exceed background sound levels at distances of up to 1 mile, and the many types of birds and mammals potentially present in this area could be disturbed during the construction period, although many of these animals are likely already habituated to the noise and activity along the Yankee Fork Road. Construction noise impacts would be short-term and localized. Disturbance from construction noise and activity may have minor effects on individuals but would have **low** overall effects on species distribution or abundance.

***Roadway Mortality/Disturbance***

Construction traffic to and from the site could disturb wildlife and cause direct mortality to species.

Overall, construction impacts would include vegetation clearing, noise, and road-related mortality. Construction timing and revegetation practices would serve to minimize the impacts of vegetation clearing on wildlife habitat. Few individuals are likely to be affected by these impacts. Accordingly, construction would result in **low** impacts on wildlife and their habitat.

**Operations**

***Habitat***

The footprint of the proposed facility would permanently eliminate the habitats that would be displaced by it. Due to the relatively small area affected, lack of habitat for special-status species, and relatively moderate to low value of habitats that would be lost, the overall impact on wildlife would be **low**.

***Wildlife Movement***

Fencing around the facility area could potentially interfere with wildlife movements along the river corridor. Fencing would be visible to animals and does not pose a risk of injury or entrapment for larger animals. The fencing would not impede movements of small mammals, amphibians, or birds, and larger animals would be able to move around the facility. Therefore, overall impacts on continued wildlife movements through the area would be **low**.

***Disturbance***

During the Chinook salmon run, which occupies a portion of the period between June and October, with precise dates varying from year to year, the fish traps would be operated 24 hours per day. Human activity and associated noise could disturb wildlife on adjacent lands, but due to lack of habitat for special status species and the abundance of similar habitat on the surrounding landscape, such impacts are likely to be **low**.

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[2] An analysis of noise impacts on human use areas and human receptors is presented in Section 3.12, *Noise*. This section also details noise associated with construction and operations of the Hatchery Program.

Lighting at the facility during operations could affect wildlife use in the immediate vicinity. However, lighting would be directed toward the ground and at features within the facility, not upwards or toward surrounding wildlife habitat, and, therefore, would not interfere with wildlife use of remaining habitats or migratory bird movements through the area. Impacts from lighting are likely to be **low**.

#### *Water Intake*

Amphibian adults, larvae, or eggs could be drawn into water intake systems. The use of fish screens would help to minimize such mortality and reduce impact levels to **low**.

#### *Wildlife/Human Conflicts*

Holding ponds and acclimation ponds are likely to attract predators interested in the fish being held. Facility managers would take preventative measures, including netting and hazing, to keep wildlife away from facilities and fish. Lethal control is not proposed. Such activities would have only temporary impacts on wildlife and would not be likely to significantly affect their ability to feed, breed, or seek shelter. Therefore, impacts would be **low**. Similarly, placement of spawned adult carcasses along the river, as proposed, could attract black bears and other predators, potentially causing conflicts with human users in the area. Specific plans and measures for avoiding such wildlife issues would be developed during the final design stage of the facility and overall impacts from operations would be **low**.

### Special Status Species

#### *Endangered Species Act Species*

As described in Section 3.8.1, *Affected Environment*, no listed wildlife species or critical habitat occur in the Yankee Fork analysis area. Wolverine, which is proposed for listing as threatened, is generally averse to human activity and any presence in the analysis area is likely to be transitory. Therefore, temporary impacts on wide-ranging individuals due to project activities is likely to be **low.**

#### *Bald and Golden Eagle Protection Act Species*

As described in Section 3.8.1, *Affected Environment*, no bald or golden eagle activity has been identified in the Yankee Fork analysis area.

#### *Idaho Species of Greatest Conservation Need*

As described in Section 3.8.1, *Affected Environment*, no Idaho Species of Greatest Conservation Need have been identified in the Yankee Fork analysis area.

#### *USFS Region 4 Sensitive Species*

As described in Section 3.8.1, *Affected Environment*, no USFS Region 4 Sensitive Species have been documented within 5 miles of the Yankee Fork analysis area. USFS Region 4 Sensitive Species potentially occurring in the Yankee Fork analysis area include bighorn sheep, three-toed woodpecker, and Columbia spotted frog. Bighorn sheep may occur in the general area but are likely to be at higher elevations than those within the Yankee Fork analysis area; thus, they are unlikely to be affected either by construction or by operations. Three-toed woodpecker may forage in the area within riparian and upland shrub and forest habitats. Such use of the area would likely be reduced during facility construction, due to avoidance induced by the associated noise and activity. Noise and activity associated with operations would be much less, and would be unlikely to affect this species. Columbia spotted frog could also occur at the Yankee Fork site. Construction would potentially result in mortality of any frogs present in the areas of clearing and active construction, but as the facility area contains little habitat suitable for frogs and both construction and operations would occur subsequent to their late-spring breeding period, few individuals would be at risk. The resulting impact would be **low**. Risks would be much reduced, and impacts unlikely, during facility operations.

#### *USFS Salmon-Challis National Forest Management Indicator Species*

Salmon-Challis National Forest Management Indicator Species potentially present in the Yankee Fork analysis area include Columbia spotted frog and pileated woodpecker. Potential impacts on Columbia spotted frog are discussed above. Pileated woodpecker, a Management Indicator Species for large and mature forests, may reduce its use of the Yankee Fork analysis area due to noise and activity associated with facility construction, a **low** impact. It would likely resume its normal activities in the area following construction, and would not likely be affected by operations.

#### *Migratory Bird Treaty Act Species*

Clearing for facility construction would remove suitable nesting habitat for a variety of migratory birds, primarily those associated with conifer forest and with riparian areas. This is unlikely to have a substantial impact because clearing would not take place during the April 1 to July 15 nesting season. Additionally, these habitats are widespread within the Yankee Fork analysis area and the proportion of these habitats that would be affected by facility construction is very small, as detailed in Section 3.4, *Vegetation*, Section 3.4.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*. Due to existing levels of human activity at the site, common migratory bird use in this area is expected to include bird species tolerant of human activities, such as gray jay, Steller's jay, Clark's nutcracker, and common raven. These species would not be substantially affected by either construction or operations of the proposed facility, a **low** impact.

#### *Summary*

In summary, the proposed Yankee Fork weir facility would have few operational impacts on wildlife or their habitat in the vicinity; those impacts would be **low**. With regard to special status species, there would be **no** impact on ESA species, Bald and Golden Eagle Protection Act species, or Idaho Species of Greatest Conservation Need, because these species do not occur in the analysis area. The proposed facility would potentially have impacts on USFS Region 4 Sensitive Species, USFS Salmon-Challis National Forest Management Indicator Species, and Migratory Bird Treaty Act Species. Wildlife belonging to these species groups is likely to be habituated to existing levels of human activity in the area and/or to be present in very low numbers; therefore, the potential impact on these species is **low**.

## Panther Creek Weir Facility

### Construction

#### *Habitat Clearing*

Impacts at the Panther Creek weir facility would be very similar to those described for the Yankee Fork weir facility, including directly removing wildlife habitats during construction. As specified in

Chapter 2, *Alternatives Including the Proposed Action*, construction work windows would typically place construction outside of the spring breeding season (April 1 to July 15), so no active nests or den sites would be disturbed during construction. Similarly, as specified above for construction impacts at the Yankee Fork weir facility, construction would avoid vegetation clearing prior to the spring breeding season, to avoid disturbing active nests or den sites. Most wildlife could thus leave the site during construction. Smaller animals that may be present on site throughout the year, such as amphibians and rodents, may be injured or killed during site clearing, grading, and dewatering. The most notable impact on wildlife during construction of proposed permanent facilities would be direct, physical disturbance of habitat along and within Panther Creek; however, due to the avoidance measures described above, the potential impact on wildlife is **low**.

#### *Noise*[3]

Noise from construction could exceed background sound levels at distances of up to 1 mile, and the many types of birds and mammals potentially present in this area could be disturbed during the construction period, although many of these animals are likely already habituated to the noise and activity along Panther Creek Road. Construction noise impacts would be **low**, short-term, and localized. Disturbance from construction noise and activity may have minor impacts on individuals but would have **low** overall impacts on species distribution or abundance.

#### *Roadway Mortality/Disturbance*

Construction traffic to and from the site could disturb wildlife and cause direct mortality to species. Since affected species are common and the number killed is likely to be low, the overall impact level would be **low**.

Overall, construction impacts would include vegetation clearing, noise, and road-related mortality. Construction timing and revegetation practices would serve to minimize the impacts of vegetation clearing on wildlife habitat. Few individuals are likely to be affected by these impacts. Accordingly, construction would result in **low** impacts on wildlife and their habitat.

### Operations

#### *Habitat*

The physical presence of the facility would permanently eliminate the habitats that would be displaced by it. Due to the relatively small area affected, lack of habitat for special status species, and relatively moderate to low value of habitats that would be lost, the overall impact on wildlife would be **low**.

#### *Wildlife Movement*

Fencing around the facility area could potentially interfere with wildlife movements along the river corridor. Fencing would be visible to animals and does not pose a risk of injury or entrapment for larger animals. The fencing would not impede movements of small mammals, amphibians, or birds, and larger animals would be able to move around the facility. Therefore, overall impacts on continued wildlife movements through the area would be **low**.

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[3] An analysis of noise impacts on human use areas and human receptors is presented in Section 3.12, *Noise*. This section also details noise associated with construction and operations of the Hatchery Program.

#### *Disturbance*

During the Chinook salmon run, which occupies a portion of the period between June and October, with precise dates varying from year to year, the fish traps would be operated 24 hours per day. Human activity and associated noise could disturb wildlife on adjacent lands, but due to lack of habitat for special status species and abundance of similar habitat on the surrounding landscape, such impacts are likely to be **low**.

Lighting at the facility during operations could affect wildlife use in the immediate vicinity. However, lighting would be directed toward the ground and at features within the facility, not upwards or toward surrounding wildlife habitat and, therefore, thus would not interfere with wildlife use of remaining habitats or migratory bird movements through the area.

#### *Water Intake*

Amphibian adults, larvae, or eggs could be drawn into water intake systems. The use of fish screens would help to minimize such mortality, resulting in a **low** impact on amphibians.

#### *Wildlife/Human Conflicts*

Acclimation ponds are likely to attract predators interested in the fish being held. Facility managers would take preventative measures, including netting and hazing, to keep wildlife away from facilities and fish. Lethal control is not proposed. Such activities would have only temporary impacts on wildlife and would not likely significantly affect their ability to feed, breed, or seek shelter. Therefore, impacts would be **low**. Similarly, placement of spawned adult carcasses along the river, as proposed, could attract black bears and other predators, potentially causing conflicts with human users in the area. Specific plans and measures for avoiding such wildlife/human conflicts would be developed during the final design stage of the facility and overall impacts would be **low**.

### Special Status Species

#### *Endangered Species Act Species*

There would be **no** impact on listed wildlife species or critical habitat in the Panther Creek analysis area because they do not occur in the area. Wolverine, which is proposed for listing as threatened, is generally averse to human activity and any presence in the analysis area is likely to be transitory due to avoidance of existing human activity in the area. Therefore, impacts on wolverines due to project activities are likely to be **low.**

#### *Bald and Golden Eagle Protection Act Species*

There would be **no** impact on bald or golden eagles because no activity has been identified in the Panther Creek analysis area.

#### *Idaho Species of Greatest Conservation Need*

As described in Section 3.8.1, *Affected Environment*, no Idaho Species of Greatest Conservation Need have been identified in the Panther Creek analysis area, but harlequin ducks have been recorded slightly outside of the Panther Creek analysis area, which could provide foraging and breeding habitat for them. Such habitat would be located along Panther Creek. Noise and activity associated with construction would likely preclude such use along portions of the stream where activities could be seen, extending approximately 0.25 mile up and downstream from the facility. Due to masking noise associated with ongoing use of the existing road, noise impacts would have **no** effect. Similarly, activity during facility operations would have a high potential to prevent harlequin duck use along portions of the stream where operational activities could be seen (i.e., within approximately 0.25 mile).

#### *USFS Region 4 Sensitive Species*

As described in Section 3.8.1, *Affected Environment*, no USFS Region 4 Sensitive Species have been documented within the Panther Creek analysis area, but a variety of species have been documented within 5 miles of the Panther Creek analysis area, including harlequin duck, great gray owl, Columbia spotted frog, and wolverine. Potential impacts on harlequin duck are discussed above. Great gray owl is a species typically associated with old, mesic forest, and is unlikely to nest in the Panther Creek analysis area. It may traverse the Panther Creek analysis area en route to or from foraging. Such transits would primarily occur at night when construction would not be occurring and few or no operational activities would occur; therefore, the potential for impacts from the proposed facility is **low**. Construction would have the potential to result in mortality of any Columbia spotted frogs present in the areas of clearing and active construction. Risks would be much reduced, and impacts unlikely, during facility operations. Wolverine is a wide-ranging species that may travel through and forage within the Panther Creek analysis area, but it is generally averse to human activity and any presence in the Panther Creek analysis area is likely to be transitory under either current conditions or under conditions of construction and operation of facilities proposed under Alternative 1. Therefore, impacts on USFS Region 4 Sensitive Species would be **low**.

#### *USFS Salmon-Challis National Forest Management Indicator Species*

Salmon-Challis National Forest Management Indicator Species potentially present in the Panther Creek analysis area include Columbia spotted frog and pileated woodpecker. Potential impacts on Columbia spotted frog are discussed above. Pileated woodpecker may reduce its use of the Panther Creek analysis area due to noise and activity associated with facility construction. It would likely resume its normal activities in the area following construction, and would not likely be affected by operations since the associated levels of noise and activity would be similar to those that exist under current conditions. Thus, impacts on these management indicator species would be **low**.

#### *Migratory Bird Treaty Act Species*

Clearing for facility construction would remove suitable nesting habitat for a variety of migratory birds, primarily those associated with conifer forest and with riparian areas. This is unlikely to be a substantial impact because these habitats are widespread within the Panther Creek analysis area and the proportion of these habitats that would be affected by facility construction is very small, as detailed in the environmental consequences discussion in Section 3.4, *Vegetation*, Section 3.4.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*. Due to existing levels of human activity at the site, common migratory bird use in this area is expected to include bird species tolerant of human activities, such as gray jay, Steller's jay, Clark's nutcracker, and common raven. Thus, construction or operations of the proposed facility would have a **low** impact on these species.

#### *Summary*

In summary, the proposed facility would have few construction or operational impacts on wildlife or their habitat in the vicinity; these impacts would be **low**. With regard to special status species, the proposed facility would have no impact on ESA species or Bald and Golden Eagle Protection Act species because these species do not occur in the analysis area. The proposed facility could potentially have impacts on Idaho Species of Greatest Conservation Need, USFS Region 4 Sensitive Species, USFS Salmon-Challis National Forest Management Indicator Species, and Migratory Bird Treaty Act Species. Wildlife belonging to these species groups is likely to be habituated to existing levels of human activity in the area and/or to be present in very low numbers; therefore, the potential impact on these wildlife species is **low**.

#### Wild and Scenic Rivers

The focus of the wildlife ORV is on wildlife viewing, primarily big game, raptors, and other birds and mammals that are uncommon in the area. The openness of the landscape in many areas along Panther Creek and the lack of vegetation along with the abundance of big game and other wildlife make Panther Creek an attractive wildlife viewing area. There are opportunities to view deer, elk, and bighorn sheep from Panther Creek Road, and Panther Creek is included on the Morgan Creek – Panther Creek Sub-loop of the Idaho Birding Trail (IDFG 2016).

At the Panther Creek weir facility, the value of this ORV is likely compromised by human activity and human occupancy at the adjacent USFS Cobalt Work Center, and viewing opportunities of smaller animals at this location are no more likely than elsewhere along Panther Creek Road. Local birds, small mammals, and resident deer are the types of species that can most often be seen here.

The operations of the facility would attract wildlife that people enjoy viewing. Species such as king fisher, great blue heron, osprey, raccoon, otter, and potentially bears would likely be attracted to the weirs, fish ladder, and holding ponds because of the presence of a food source (fish). There would be long-term positive impacts of restoring the Chinook runs, as increase in fish species would likely attract wildlife predators and increase opportunities for wildlife viewing along Panther Creek Road. The success of the Panther Creek weir facility would increase the value of the wildlife ORV in the long term, and the level of adverse impacts would be **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, impacts on wildlife associated with construction of the hatchery facilities would be the same as full production under Alternative 1. Implementing project design measures, construction timing restrictions, and revegetation practices would minimize risk of impacts related to the removal of low-quality wildlife habitat and generation of noise associated with construction work, ensuring impacts on wildlife and wildlife habitat are **low**.

Although production of Chinook salmon would be reduced by 50%, the operational impacts on wildlife associated with this reduced production option would be slightly less compared to the full production option under Alternative 1. Compared to full production, fewer vehicle trips would be needed to convey smolts from the hatchery to the weir sites, resulting in a small reduction in operational impacts on wildlife associated with vehicle use (primarily, incidental mortality due to collisions). In addition, project design measures would minimize the risk of impacts associated with operational activity, noise, light, and hazing, resulting in **low** impacts on wildlife.

#### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, construction-related impacts on wildlife would also be the same. Implementing project design measures, construction timing restrictions, and revegetation practices would minimize risk of impacts related to the removal of low-quality wildlife habitat and generation of noise associated with construction work, ensuring impacts on wildlife and wildlife habitat are **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Operational impacts associated with this reduced production option, however, would be slightly less compared to the full production option under Alternative 1 because fewer vehicle trips would be needed to convey fish from the weir sites to the hatchery, resulting in a small reduction in operational impacts on wildlife associated with vehicle use (primarily, incidental mortality due to collisions). In addition, project design measures would minimize the risk of impacts associated with operational activity, resulting in **low** impacts on wildlife.

## 3.8.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts on wildlife at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

#### Construction

Under Alternative 2, no construction of permanent facilities would occur at the Yankee Fork site, and no permanent or temporary impacts on wildlife habitats would occur.

#### Operations

Operation of the Yankee Fork weir facility under Alternative 2 would include the annual installation and removal of the temporary picket weir and fish trap in the Yankee Fork channel. These activities would involve the placement of metal components in the channel for approximately three to four months during the summer and early fall.

#### *Disturbance*

During the Chinook salmon run, which occupies a portion of the period between June and October, with precise dates varying from year to year, the fish traps would be operated 24 hours per day. Human activity and associated noise could disturb wildlife on adjacent lands, but due to lack of habitat for special status species and abundance of similar habitat on the surrounding landscape, such effects are likely to be **low**.

Lighting at the facility during operations could affect wildlife use in the immediate vicinity. However, lighting would be directed toward the ground and at features within the facility, not upwards or toward surrounding wildlife habitat, and thus would not interfere with wildlife use of remaining habitats or migratory bird movements through the area, and adverse effects of lighting would be **low**.

#### *Water Intake*

Amphibian adults, larvae, or eggs could be drawn into water intake systems. The use of fish screens would help to minimize such mortality, resulting in a **low** impact on amphibians.

#### *Wildlife/Human Conflicts*

Holding ponds and acclimation ponds are likely to attract predators interested in the fish being held. Facility managers would take preventative measures, including netting and hazing, to keep wildlife away from facilities and fish. Lethal control is not proposed. Such activities would have only temporary impacts on wildlife and would not be likely to significantly affect their ability to feed, breed, or seek shelter. Therefore, impacts would be low. Similarly, placement of spawned adult carcasses along the river, as proposed, could attract black bears and other predators, potentially causing conflicts with human users in the area. Specific plans and measures for avoiding such wildlife issues would be developed during the final design stage of the facility and overall impacts would be **low**.

### Special Status Species

#### *Endangered Species Act Species*

As described in Section 3.8.1, *Affected Environment*, no wildlife species or critical habitat listed or proposed for listing occur in the Yankee Fork analysis area.

#### *Bald and Golden Eagle Protection Act Species*

As described in Section 3.8.1, *Affected Environment*, no bald or golden eagle activity has been identified in the Yankee Fork analysis area.

#### *Idaho Species of Greatest Conservation Need*

As described in Section 3.8.1, *Affected Environment*, no Idaho Species of Greatest Conservation Need have been identified in the Yankee Fork analysis area.

#### *USFS Region 4 Sensitive Species*

As described in Section 3.8.1, *Affected Environment*, no USFS Region 4 Sensitive Species have been documented within the Yankee Fork analysis area, but osprey and wolverine have been documented within 5 miles. Due to the wide-ranging nature of these two species, they may travel through and forage within the Yankee Fork analysis area. Wolverine is generally averse to human activity and any presence in the Yankee Fork analysis area is likely to be transitory. Human activities that occur under current conditions (primarily use of the road through the area) are likely to preclude use of the area by this species. Osprey, however, habituate readily to human activity and are often attracted to the foraging opportunities presented by fish hatcheries and related facilities. Thus, osprey use of the Yankee Fork analysis area may be increased if Alternative 2 is implemented due to an increase in foraging opportunities, a **low** impact.

Other USFS Region 4 Sensitive Species potentially occurring in the Yankee Fork analysis area include bighorn sheep, three-toed woodpecker, and Columbia spotted frog. Bighorn sheep may occur in the general area but are likely to be at higher elevations than those within the Yankee Fork analysis area; thus, they are unlikely to be affected either by construction or operations. Three-toed woodpecker may forage in the area within riparian and upland shrub and forest habitats. Noise and activity associated with operations would be little different from current conditions, and are unlikely to affect this species. Columbia spotted frog could also occur at the Yankee Fork site; however, because the analysis area contains little habitat suitable for frogs, and operations would occur subsequent to their late-spring breeding period, few individuals would be at risk and the resulting impact would be **low**.

#### *USFS Salmon-Challis National Forest Management Indicator Species*

Salmon-Challis National Forest Management Indicator Species potentially present in the Yankee Fork analysis area include Columbia spotted frog and pileated woodpecker. Potential impacts on Columbia spotted frog are discussed above. Pileated woodpecker, a Management Indicator Species for large and mature forests, would not likely be affected by operations, since the associated levels of noise and activity would be similar to those that exist under current conditions.

#### *Migratory Bird Treaty Act Species*

Due to existing levels of human activity at the site, common migratory bird use in this area is expected to include bird species tolerant of human activities, such as gray jay, Steller's jay, Clark's nutcracker, and common raven. These species would not be substantially affected by operations of the proposed temporary facility, since the associated levels of noise and activity would be similar to those that exist under current conditions.

#### *Summary*

In summary, the proposed facility would have few operational impacts on wildlife or their habitat in the vicinity; these impacts would be **low**. With regard to special status species, the proposed facility would have no impact on ESA species, Bald and Golden Eagle Protection Act species, or Idaho Species of Greatest Conservation Need, because these species do not occur in the analysis area. The proposed facility could potentially impact USFS Region 4 Sensitive Species, USFS Salmon-Challis National Forest Management Indicator Species, and Migratory Bird Treaty Act species. Wildlife belonging to these species groups is likely to be habituated to existing levels of human activity in the area and/or to be present in very low numbers; therefore, the potential impact on wildlife is **low**.

### Panther Creek Weir Facility

#### Construction

Under Alternative 2, no construction would occur at the Yankee Fork site, and no permanent or temporary impacts on wildlife habitats would occur.

#### Operations

Operations at Panther Creek under Alternative 2 would include the annual installation and removal of the temporary picket weir and fish trap in the Panther Creek channel. These activities would involve the placement of metal components in the channel for approximately three to four months during the summer and early fall.

##### *Disturbance*

During the Chinook salmon run, which occupies a portion of the period between June and October, with precise dates varying from year to year, the fish traps would be operated 24 hours per day. Human activity and associated noise could disturb wildlife on adjacent lands, but due to lack of habitat for special status species and abundance of similar habitat on the surrounding landscape, such impacts are likely to be **low**.

Lighting at the facility during operations could affect wildlife use in the immediate vicinity. However, lighting would be directed toward the ground and at features within the facility, not upwards or toward surrounding wildlife habitat and, therefore, would not interfere with wildlife use of remaining habitats or migratory bird movements through the area, and adverse impacts of lighting would be **low**.

##### *Water Intake*

Amphibian adults, larvae, or eggs could be drawn into water intake systems. The use of fish screens would help to minimize such mortality, resulting in a **low** impact on amphibians.

##### *Wildlife/Human Conflicts*

Acclimation ponds are likely to attract predators interested in the fish being held. Facility managers would take preventative measures, including netting and hazing, to keep wildlife away from facilities and fish. Lethal control is not proposed. Such activities would have only temporary impacts on wildlife and would not be likely to significantly affect their ability to feed, breed, or seek shelter. Therefore, impacts would be low. Similarly, placement of spawned adult carcasses along the river, as proposed, could attract black bears and other predators, potentially causing conflicts with human users in the area. Specific plans and measures for avoiding such wildlife/human conflicts would be developed during the final design stage of the facility and overall impacts would be **low**.

#### Special Status Species

##### *Endangered Species Act Species*

As described in Section 3.8.1, *Affected Environment*, no wildlife species or critical habitat listed or proposed for listing occur in the Panther Creek analysis area.

### *Bald and Golden Eagle Protection Act Species*

As described in Section 3.8.1, *Affected Environment*, no bald or golden eagle activity has been identified in the Panther Creek analysis area.

### *Idaho Species of Greatest Conservation Need*

As described in Section 3.8.1, *Affected Environment*, no Idaho Species of Greatest Conservation Need have been identified in the Panther Creek analysis area, but harlequin ducks have been recorded slightly outside of the Panther Creek analysis area, which could provide foraging and breeding habitat for them. Such habitat would be located along Panther Creek. Noise and activity associated with operations would likely preclude such use along portions of the stream where activities could be seen, extending approximately 0.25 mile up and downstream from the facility. Due to masking noise associated with ongoing use of the existing road, noise impacts would be less likely to have impacts.

### *USFS Region 4 Sensitive Species*

As described in Section 3.8.1, *Affected Environment*, no USFS Region 4 Sensitive Species have been documented within the Panther Creek analysis area, but three such species have been documented within 5 miles of the Panther Creek analysis area: harlequin duck, great gray owl, Columbia spotted frog, and wolverine. Potential impacts on harlequin duck are discussed above. Great gray owl is a species typically associated with old, mesic forest, and is unlikely to nest in the Panther Creek analysis area. It may traverse the Panther Creek analysis area en route to or from foraging. Such transits would primarily occur at night when few or no operational activities would occur; therefore, the potential for impacts from the proposed facility is **low**. Little risk to any Columbia spotted frogs present during facility operations would occur, because operations do not include activities in the habitat for this species. Wolverine is a wide-ranging species that may travel through and forage within the Panther Creek analysis area, but it is generally averse to human activity and any presence in the Panther Creek analysis area is likely to be transitory under either current conditions or under conditions of operation of facilities proposed under Alternative 2.

### *USFS Salmon-Challis National Forest Management Indicator Species*

Salmon-Challis National Forest Management Indicator Species potentially present in the Panther Creek analysis area include Columbia spotted frog and pileated woodpecker. Potential impacts on Columbia spotted frog are discussed above. Pileated woodpecker would not likely be affected by operations, since the associated levels of noise and activity would be similar to those that exist under current conditions, and the level of impact would be **low**.

### *Migratory Bird Treaty Act Species*

Due to existing levels of human activity at the site, common migratory bird use in this area is expected to include bird species tolerant of human activities, such as gray jay, Steller’s jay, Clark’s nutcracker, and common raven. These species would not likely be impacted by operations of the proposed facility, since the associated levels of noise and activity would be similar to those that exist under current conditions.

#### *Summary*

In summary, the proposed facility would have few operational impacts on wildlife or their habitat in the vicinity; these impacts would be **low**. With regard to special status species, the proposed facility would have no impact on Endangered Species Act species or Bald and Golden Eagle Protection Act species because these species do not occur in the analysis area. The proposed facility could potentially have impacts on Idaho Species of Greatest Conservation Need, USFS Region 4 Sensitive Species, USFS Salmon-Challis National Forest Management Indicator Species, and Migratory Bird Treaty Act Species. Wildlife belonging to these species groups is likely to be habituated to existing levels of human activity in the area and/or to be present in very low numbers; therefore, the potential impact on these species is **low**.

### Wild and Scenic Rivers

Under Alternative 2, the impacts on the wildlife ORV would be the same as under Alternative 1. Opportunities to view wildlife would be the same, and the long-term benefit of restoring Chinook runs that would attract wildlife to the area providing opportunity for viewing from Panther Creek road would be the same. The success of the Panther Creek weir facility would increase the value of the wildlife ORV in the long term, and the level of adverse impacts would be **low**.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for the full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weir at the Yankee Fork and Panther Creek sites. As a result, there would be **no** noise-related construction impacts.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Operational impacts associated with this reduced production option, however, would be slightly less compared to the full production option under Alternative 2 because fewer vehicle trips would be needed to convey fish from the weir sites to the hatchery. Therefore, under the 50% production option there would be a small reduction in operational impacts on wildlife associated with vehicle use (primarily, incidental mortality due to collisions), which is a **low** impact.

# 3.8.3 Mitigation

The Shoshone-Bannock Tribes would implement the following mitigation measures to avoid or minimize impacts on wildlife and their habitat during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.8.3.1 Alternative 1

### Construction

The following measures apply to construction at the Crystal Springs hatchery, Yankee Fork and Panther Creek sites:

- Avoid clearing trees or other vegetation that may contain nesting migratory birds during the migratory bird nesting season, which may occur as early as January (primary for owls and hawks) and continue through July of any given year. Clearing may be conducted during the nesting season if nest sites are determined to be absent by a qualified biologist, and if approved by designated Idaho Fish and Game or U.S. Fish and Wildlife Service representatives.
- Erect temporary fencing around areas that are not to be disturbed to protect them during construction.
- Develop and implement a plan to revegetate temporarily disturbed areas to provide wildlife habitats and reduce the risk of weed encroachment.

#### Crystal Springs Hatchery Site

In addition to the measures listed above, implement the following measures at the Crystal Springs hatchery site to minimize impacts on wildlife:

- Minimize disturbance to big sagebrush vegetation cover type.
- Check for nesting birds in abandoned structures and do not demolish structures when active nests are present.

#### Yankee Fork and Panther Creek Weir Facilities

No site-specific measures for weir facility operations, in addition to the measures already listed above, would be recommended at the Yankee Fork and Panther Creek sites under Alternative 1.

### Operations

The following measures apply to operations at the Crystal Springs hatchery, Yankee Fork and Panther Creek sites:

- Minimize lighting and use lighting fixtures that direct light downward and not towards off-site areas to minimize disturbance to wildlife.
- Install fish screens at water intake structures to minimize entrainment of aquatic species.
- Develop and implement a plan to minimize and manage predatory wildlife being attracted to fish and other potential food sources available at the facility.

#### Crystal Springs Hatchery Site

No site-specific measures for hatchery operations would be recommended at the Crystal Springs hatchery site under Alternative 1.

#### Yankee Fork and Panther Creek Weir Facilities

At the Yankee Fork and Panther Creek weir facilities, develop a plan to avoid human/wildlife conflicts prior to distributing carcasses of spawned adults.

### 3.8.3.2 Alternative 2

#### Construction

#### Crystal Springs Hatchery Site

The same mitigation described for construction of the Crystal Springs hatchery under Alternative 1 would also be implemented for Alternative 2.

#### Yankee Fork and Panther Creek Weir Facilities

No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended.

#### Operations

The same mitigation measures recommended for Alternative 1 operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would also be implemented under Alternative 2.

## 3.8.4 No Action Alternative

Under the No Action Alternative, the Hatchery Program would not be constructed, and no permanent or temporary fish management facilities would be operated. Existing conditions would continue, and no wildlife impacts would occur. There would be **no** impacts on wildlife under the No Action Alternative.

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# 3.9 Cultural Resources

This section describes the affected environment and environmental consequences, including mitigation measures, associated with cultural resources, resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level and a 50% production level. This section also summarizes the federal Wild and Scenic Rivers Analysis presented in Appendix D for the historic/cultural outstandingly remarkable values (ORVs), which are considered in the affected environment and the environmental consequences analysis of cultural resources at the Yankee Fork weir facility.

The term cultural resources refers to the broad range of resources that represent or convey a place's heritage or help tell the story of a region's past. These resources are considered important to a community and worth preserving. A cultural resource can be any building, structure, object, site, landscape, or district associated with human manipulation of the environment. These resources are often valued (monetarily, aesthetically, or religiously) by a particular group of people and can be historical in character or date to the prehistoric past (i.e., prior to written records).

Three categories of cultural resources are discussed in this section: archaeological resources, historical resources, and culturally significant properties. Archaeological resources encompass features and deposits located on or below the ground surface that are evidence of prior human occupation or use in a particular area. Historical resources are elements of the built environment, such as buildings or structures, or human-made objects or landscapes. Finally, culturally significant properties are sites or locations considered culturally important to the history of a group of people, or are locations where culturally important events or practices are known to have occurred.

## 3.9.1 Affected Environment

### 3.9.1.1 Analysis Area

The analysis area considers cultural resources that could be affected by construction or operation under each alternative. Under Alternatives 1 and 2, the analysis area consists of three discrete project sites, encompassing the proposed Crystal Springs hatchery and the two weir facilities at Yankee Fork and Panther Creek. The three sites are the locations where potential impacts resulting from project activities, such as demolition, construction, staging, and equipment storage, may occur. At the Crystal Springs hatchery site, the analysis area also includes the area of a former hatchery facility that is adjacent to the proposed construction footprint. The depth of potential ground disturbance in the analysis area varies according to construction practice. Under Alternative 1, potential ground disturbance to a depth of 8 feet is expected at the Yankee Fork and Panther Creek sites for the construction of permanent weirs, new holding ponds, and fish ladders. Under Alternative 2, no ground disturbance is expected at the Yankee Fork weir as the existing temporary weir would continue to be operated. No excavation or drilling of holes would be needed to install the temporary weir structure. The picket panels for the temporary weir would be assembled on site by Tribal staff without the use of any heavy machinery.

### 3.9.1.2 Methods

Three methods of investigation were used to collect data about possible cultural resources in the analysis area and to assess potential project impacts on these resources. Primary and secondary source research, archaeological investigations, and a historical resources survey were conducted. Research was conducted to identify previously documented cultural resources in and within 1 mile of the analysis area, and to establish the precontact, ethnographic, and historical contexts for the analysis area. For this effort, records were provided by the North Fork Ranger District office of the Salmon-Challis National Forest and the Idaho State Historic Preservation Office in 2014. Pedestrian and subsurface archaeological investigations were conducted in the accessible areas of each portion of the analysis area. These investigations included excavating shovel probes in high probability areas where Hatchery Program-related ground disturbance is anticipated. The historic resources survey involved an examination of buildings and structures in the analysis area determined to be 45 years of age or older.

### 3.9.1.3 Background

#### Pre-contact Setting

The analysis area is located at the interface between two cultural regions: the Great Basin and the Eastern Plateau regions. In Idaho, the Eastern Plateau region encompasses all of the land north of Boise, Idaho, including the Yankee Fork and Panther Creek portions of the analysis area. The Snake and Salmon River portion of the Great Basin region extends across the whole of Idaho from Twin Falls north to approximately Stanley, and encompasses the Yankee Fork and Crystal Springs hatchery areas. The Snake and Salmon River area and the Eastern Plateau region overlap in central Idaho. Many cultural histories have been developed for this region as a whole, and most share common characteristics and divide the precontact era into three roughly contemporaneous periods.

The earliest human occupation of the region was at least 12,500 years ago. This early period is characterized by highly mobile groups hunting large game, supplemented by seasonal foraging and small game hunting (Wedel 1978). Based on its distinguishing spearpoints, this early period has been divided into the Clovis, Folsom, and Plano subperiods (Butler 1986). The second period, known as the Archaic period, is described as being from 5,800 B.C. to A.D. 500. This period does not represent a huge departure from the large game hunting of the earlier period, but the archaeological record suggests that migratory hunting and gathering practices began to transition to a more diverse resource base.

The Late period, from A.D. 500–1805, shows the greatest representation in the material record, with a diverse array of artifacts and multiple distinguishable cultural manifestations. Pottery came into common use during this period, and a wider range of resource foraging and communal hunting is evident (Butler 1986). The Late period has traditionally been marked by the introduction and widespread use of the bow and arrow. However, recent research has challenged this notion. Late period structures from western Idaho typically consist of "small wickiup-sized" structures, as well as large pit houses (Butler 1986).

#### Ethnographic Background

The analysis area was traditionally inhabited or used by three groups: the Bannock of the Northern Paiute, the Northern Shoshone peoples, and the Nez Perce (Murphy and Murphy 1986; Ruby and

Brown 2010; Walker 1998). The first two groups occupied an area south of the Salmon River in what is now southern and central Idaho (Murphy and Murphy 1986), while the Nez Perce territory consisted of central Idaho, the southeast corner of Washington, and the northeast corner of Oregon (Walker 1998).

The Bannock and Northern Shoshone groups made their seasonal rounds in central and southern Idaho, as well as eastern Washington and Oregon, and Montana, Nevada, Wyoming, and Utah. In winter, many of the Bannock and Northern Shoshone people made camps along the Snake River (Steward 1938). During the summer months, both groups hunted buffalo and gathered a wide variety of plants (Murphy and Murphy 1960). Fishing was also an important component of their subsistence (Murphy and Murphy 1986). The Nez Perce territory centered on the middle Snake and Clearwater rivers and the northern portion of the Salmon River. They lived a mobile lifeway utilizing a variety of regions ranging from low river valleys to highlands. The fall run of salmon, along with late roots and berries, were typically dried and stored for the winter. By November most travel ceased and the Nez Perce settled into winter villages until the early spring. In the spring, trips were taken to fish for early runs of salmon. As spring progressed, roots were gathered at lower elevations. Hunting was continuous throughout the year but waned in importance during the salmon runs (Walker 1967). By midsummer, the Nez Perce would generally leave the lower valleys and move to the higher elevations to hunt and harvest later growing roots and berries.

By the nineteenth century, fur trappers and traders entered the region and began to interact with the Bannock and Northern Shoshone. The first trading posts were established in the region by 1809. By the time the fur trade began to decline in the 1840s, large numbers of European Americans were making their way to California and the Oregon territory. As European-American presence increased in the region, large-scale commercial hunting resulted in the disappearance of the buffalo herds in the 1860s. This event, along with European-American encroachment onto lands traditionally used by the Bannock and Northern Shoshone, resulted in a disruption in Native American lifeways (Murphy and Murphy 1986).

In 1863, the Bannocks and the Northern Shoshone signed the Treaty of Soda Springs at Fort Hall, which allowed European Americans to pass peacefully through their lands. However, the Bannocks never received the annuities of this treaty (Ruby and Brown 2010). A second treaty was signed at Fort Bridger in 1868 that placed Shoshone and Bannock peoples on a reservation southeast of Fort Hall, and it was ratified by the United States Senate that same year. In 1869, President Ulysses S. Grant affirmed through executive order that the Fort Hall Reservation was the new permanent homeland for various Shoshone and Bannock bands. This and other policies led to a period of conflict, followed by a series of treaties designed to reach an agreement with the remaining bands of the Bannock and Northern Shoshone in 1880, 1881, 1887, and 1898 (Clemmer and Stewart 1986).

In 1855, the Nez Perce ceded much of their homeland for a reservation of over 7,500,000 acres. In 1863, after the discovery of gold on their reservation, a second treaty was negotiated that greatly reduced the size of the reservation. Further encounters during the early 1870s resulted in conflicts with the U.S. Army. These conflicts were known as the Nez Perce war. A small number of Nez Perce were able to escape to Canada during this period, while others were settled throughout Indian Territory (Oklahoma), Lapwai, and on the Colville Reservation (Ruby and Brown 2010).

The majority of members of the Shoshone-Bannock Tribes (Tribes) are currently located at the 544,000-acre Fort Hall Reservation in southeastern Idaho. Most of the Nez Perce descendants are members of the Nez Perce Tribe of Idaho and live on or near the Nez Perce reservation.

Members of the Shoshone-Bannock Tribes currently harvest spring/summer-run Chinook salmon in basins where hatchery programs operate to increase abundance of stocks to harvestable levels. Contemporary hatchery management is focused on providing mainstem angling opportunities in lieu of focusing efforts on restoring terminal fisheries in tributaries where members of the Tribes traditionally fished. This shift in the location of where programs have operated may have resulted in a disproportionate impact on Tribal fishermen by changing both the location of harvest and the method of harvest. Failure to implement consistent hatchery operations in tributaries such as Yankee Fork and Panther Creek has resulted in low abundance and a depressed Tribal harvest rate in both systems. (Stone pers. comm. 2016)

The Hatchery Program would replenish culturally important fish species to the traditional waterways of Tribal communities, and ensure that Tribal members have the opportunity to harvest these species using both traditional methods (e.g., spearing) and contemporary methods (e.g., weirs, hook-and-line, nets). Members of the Tribes continue to harvest anadromous fish under rights reserved by the Fort Bridger Treaty of 1868, and historically harvested salmon and trout throughout the Columbia River Basin. Fishing opportunities for contemporary communities have been heavily constrained by decreased runs of these fish species, with recent harvest opportunities for Tribal members supplying only half a pound of salmon per person. Historical use is compared at 700 pounds per person. The Hatchery Program ensures that Tribal members would have sustainable and increased access to harvesting of traditional fish species in traditional areas, ensuring continued subsistence and ceremonial use. (Shoshone-Bannock Tribes 2013)

The Hatchery Program would provide two additional watersheds for Tribal members to engage in subsistence fishing activities, including the Yankee Fork and Panther Creek watersheds. Engaging in subsistence fishing provides Tribal families with high quality foods throughout the year and alleviates some of the financial burden of purchasing foods from local grocery stores. As the Hatchery Program develops, the Yankee Fork and Panther Creek weir facilities could be used to collect fish for communal distribution on the Fort Hall Reservation to elders or members who cannot afford to travel for fishing activities during the summer. (Stone pers. comm. 2016)

## Historical Setting

Fort Hall was established in 1834 by Nathaniel Jarvis Wyeth at a location approximately 2 miles southeast of the Crystal Springs hatchery analysis area. Wyeth established Fort Hall as a warehouse and weigh station for the purpose of fur trapping and trading in the Snake River region. It was the only European-American outpost in that area at the time. Fort Hall became part of the British Hudson's Bay Company's network of Pacific Northwest outposts in 1837 and became an important locus for the region's fur trade. It later developed as an important station for emigrants traveling on the Oregon Trail. Through the 1850s, Fort Hall was considered the end of the trail's common 500-mile route, which was shared by the three primary far west emigrant trails. It was a short distance after Fort Hall that the Oregon and California trails diverged in northwesterly and southwesterly directions (Mackie 1997: 106–107).

During the early 1800s, Idaho was a part of what was then known as the Oregon Country or Columbia District, primarily encompassing the Columbia and Snake River watersheds. Control of the region was under dispute between the United States and Great Britain, although it remained open to settlement and economic activity by European Americans. Traders and fur trappers were the primary purveyors of this activity, with the Hudson's Bay Company maintaining an effective monopoly on trade (Horner 1919: 60–64). Some trappers settled in the region and began farming, and a number of missionaries started arriving in the 1830s.

The Oregon Country's conflicting territorial claims eventually led to several treaties, including the Treaty of 1818, which established a "joint occupation" of the Oregon Country between the United States and Great Britain (Corning 1989: 129). This delicate balance remained the status quo until the signing of the Oregon Treaty of 1846, which settled the boundary dispute. In 1848, Congress established the Oregon Territory as an official U.S. territory with the passage of the Act to Establish the Territorial Government of Oregon. The territory was then divided into the Oregon and Washington territories in 1853. Northern Idaho became part of the Washington Territory and southern and central Idaho remained in the Oregon Territory (Arrington 1994).

The Donation Land Claim Act of 1850, along with the establishment of the Oregon and Washington territories, effectively opened the region to settlement by European-American emigrants. An estimated 270,000 emigrants reached Fort Hall on their way west in the late 1840s and 1850s. The Hudson's Bay Company discontinued operations at Fort Hall sometime around 1856. The outpost was used by itinerant traders for a few years thereafter and again by U.S. Army regulars and Oregon Volunteers who camped at the location while patrolling the Oregon Trail in the late 1850s and early 1860s. A flood destroyed much of the fort in 1863. During the 1860s and 1870s, overland stage and mail lines used the site, a key road junction, as a base. So, too, did freighters hauling supplies to mining camps in Oregon, Washington, Idaho, and Montana. Meanwhile, the community of Fort Hall, Idaho, was established in 1870 around a new U.S. Army post located approximately 25 miles to the northeast of the Crystal Springs hatchery analysis area (Snell 1963).

In the mid- to late-nineteenth century, much of central and southern Idaho remained largely unsettled. It was only after the discovery of gold in Clearwater County in 1860 that miners rapidly descended into the region and many new towns and settlements began to appear (Stephens 1991). As mining expanded, so did farming and ranching to support the growing populations. The California legislature passed a series of herd and fence laws that sharply restricted access to the open range in the 1860s. Seeking to escape these restrictions, stockmen in Northern California increasingly concentrated their herds in parts of the Harney River basin and the Malheur and lower Owyhee River valleys in southeastern Oregon and southwestern Idaho. The cattle industry grew rapidly thereafter, becoming well established in Idaho by the 1880s (Filby, n.d.; Robbins 2002). Subsistence farmers followed in the wake of Idaho's cattle ranchers, settling in the river basins of the state's southern and western regions.

In 1869, Union Pacific's transcontinental railroad line was completed through Ogden, Utah, and later Salt Lake City, allowing miners and farmers in Idaho to more easily import and export goods and services. With the completion of the Utah & Northern Railway, the Oregon Short Line, and the Northern Pacific Railway in the late 1870s and early 1880s, the population of Idaho almost doubled (Arrington 1994).

The Idaho Territory, a portion of which would later become the State of Idaho, was formally established by the Organic Act in 1863. By the time President Lincoln signed the Act, the territory already had four counties and covered an area of 325,000 square miles, including all of what is now Idaho and Montana as well as most of Wyoming. By the late 1880s, the population of Idaho was large enough to be considered for statehood. It became the 43rd State of the Union in 1890.

### 3.9.1.4 Crystal Springs Hatchery Site

The Crystal Springs hatchery analysis area is located on a broad alluvial plain. Prior ground disturbance, including ground clearing, road construction, agricultural development, and hatchery facility construction, has occurred along the northern and eastern portions of the analysis area. Much of the area was formerly occupied by a fish hatchery operation that existed on the property from 1969/1970 through the mid-1990s. The facility closed circa 1994 and its many buildings and structures were removed or abandoned in years following. The property is currently vacant, containing several ruined elements of the former hatchery, including a service building, concrete fish raceways, and a remnant water pump.

Development in the vicinity of the Crystal Springs hatchery analysis area began in the late nineteenth century as homesteaders travelling the Oregon Trail entered the region and established farms in the area. One of the earliest settlers in the vicinity of the Crystal Springs hatchery was Benjamin Franklin Tanner (1883–1916). Tanner purchased the lots that encompass the Crystal Springs hatchery analysis area, consisting of approximately 132 acres, from the federal government in 1907 (USBLM 1907). The Tanner property was subsequently purchased by the Boise Payette Lumber Company in 1926 (USBLM 1926).

The Boise Payette Lumber Company owned the property encompassing the Crystal Springs hatchery analysis area from 1925 until at least the mid-1940s, and likely through the late 1960s. During this period, the property contained an office/residence, outbuildings, and a lake. The residence/office is believed to have been constructed by the company sometime in the late 1920s or 1930s. It was demolished in October 1996.

The Crystal Springs hatchery analysis area remained largely unchanged during its occupation by the Boise Payette Lumber Company until the establishment of a fish hatchery on the analysis area in 1969–1970. In the late 1960s, it was leased or acquired by the Crystal Springs Trout Company, which then turned the property into a fish hatchery. The fish hatchery was the company's third facility in the Blackfoot-Pocatello-Springfield area. Known as the Crystal Springs Trout Farm #3, it was originally one of three geographically separate trout farms owned and operated by the company (Klontz and King 1974: 54). The Crystal Springs Trout Company was established in 1942 by Morris Davis and Ralph Nelson. These individuals were early pioneers in Idaho's aquaculture industry and are considered largely responsible for developing commercial rainbow trout farming in the Blackfoot-Pocatello-Springfield area, beginning in the 1910s.

The facilities of the Crystal Springs Trout Farm #3 were constructed by the Crystal Springs Trout Company in 1969–1970. Construction seems to have involved the removal of nearly all the older buildings and structures on the property, erection of an incubator building and a system of concrete raceways, and installation of wells and other structures to direct the natural artesian springs. A substantial amount of grading and levee construction also occurred, reconfiguring the property's lake into five separate holding ponds. The Crystal Springs Trout Farm #3 was in operation until 1994. In the years following its closure, the facility's many buildings and structures were removed or abandoned (Schneddon and Miller 2011).

#### Identified Cultural Resources at Crystal Springs Hatchery

One cultural resource was identified in the analysis area for the Crystal Springs hatchery site. It consists of the remnants of the Crystal Springs Trout Farm #3, which occupy the area's eastern section. The fish hatchery was previously identified during a cultural resources survey of the property in 1997. It and the surrounding property were recorded as the "Houghland Farm" by this survey (Galm 1997).

Individual elements of the former Crystal Springs Trout Farm #3 include: an incubator building, five artesian springs/wells that supplied water to the hatchery facilities, five separate holding ponds, three concrete and one timber flow control (check) structures between ponds, concrete raceways, two water pump remnants, and remnants of an access road. Nearly all of these elements were previously part of an interconnected system for the rearing of fish involving the flow of water and movement of fish from one area to another.

Three other previously recorded cultural resources are located within 1 mile of the Crystal Springs hatchery analysis area. These resources include an historical-era plow area approximately 0.3 miles to the south of the analysis area, a former emigration trail and stage route located within 1 mile of the analysis area, and a precontact lithic scatter about 1 mile west of the analysis area (Idaho State College Museum 1962; Chance 1990; Edgerton 1992).

The Crystal Springs hatchery site has been previously determined not eligible for listing in the National Register of Historic Places (Galm 1997). The report making this determination was not submitted to the Idaho State Historic Preservation Office (SHPO), and subsequently has not been agreed upon by the SHPO. Consultation with the SHPO will be conducted.

#### 3.9.1.5 Yankee Fork Weir Facility

The Yankee Fork analysis area is located on a valley bottom and extends across two landform types: an active stream channel and floodplains. Several ground altering activities have occurred along the northern and eastern portions of the analysis area, including ground clearing, road construction, and dredge mining. In addition, the Yankee Fork River and the current alignment of Yankee Fork Road bisect the analysis area.

Prior development in the vicinity of the Yankee Fork analysis area was almost entirely related to historical mining activities during the early to middle twentieth century and the subsequent establishment of the Yankee Fork mining district. Gold was discovered in several places within the Yankee Fork watershed in the 1860s. It was not until the 1870s, however, that Loon Creek prospectors discovered placer gold at the confluence of Jordan Creek and Yankee Fork, initiating a sudden rush of miners and traders into the Yankee Fork valley. The towns of Bonanza (1877) and Custer (1879) were founded in the years following and flourished until the mining boom ended circa 1910 (Wood 2011: 1). Bonanza is located approximately 4.5 miles north of the Yankee Fork analysis area, and Custer is located approximately 6.5 miles northeast of the analysis area.

Road developments followed the establishment of these towns and the region's various mining camps. One of the primary routes into the region was along the Stanley to Bonanza Wagon Road, which first appeared on maps in the 1880s. The Civilian Conservation Corps improved these routes in the 1930s, resulting in the construction of the Custer Motorway. Part of this route is known today as the existing Yankee Fork Road. The motorway incorporated and improved elements from the region's older wagon roads and trails to create a scenic "adventure road" through the Yankee Fork mining district (Walsworth 2002a).

The Civilian Conservation Corps was also responsible for construction of the Flat Rock Campground, located south of the analysis area on Yankee Fork Road. Completed in the mid-1930s, it exemplified the type of outdoor recreational facilities constructed for the U.S. Forest Service (USFS) in the area at that time (Walsworth 2002b). The Pole Flat Campground, which is located immediately east but outside the Yankee Fork analysis area, was established sometime in the late 1950s or early 1960s.

Large-scale placer mining resumed within the Yankee Fork watershed in the late 1930s and 1940s. Tests were conducted between 1935 and 1939 on patented and unpatented claims along the Yankee Fork, followed by full-scale dredging operations. The Bucyrus-Erie Company received the contract to build the dredge in 1940 and completed it in the fall of that year. The Snake River Mining Company operated the dredge for several years until it reached a rock dike below Bonanza in 1949. The company then sold the dredge to two private investors, who continued operations until 1952. In 1966, the dredge was donated to the Challis National Forest. The dredging that took place during these years resulted in the creation of dredge tailings along this entire length of the Yankee Fork, known as the Yankee Fork Gold Dredge Tailings. The Yankee Fork represents one of the few regions in Idaho in which the original dredge and dredge tailings are still in existence and in their original locations (McDaniel et al. 2014; Wood 2011).

## Wild and Scenic Rivers Act

Under the National Wild and Scenic River System, Yankee Fork is considered eligible under the "Recreation" classification for Wild and Scenic Rivers (USFS 1989).[1] Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad and may have some development along their shorelines or may have undergone some impoundment or diversion in the past. Yankee Fork has two eligible segments relevant to this analysis: Segment A is the lower reach heading upstream 2 miles from the mouth of Yankee Fork; Segment B is immediately upstream of Segment A, from the private land boundary upstream from the Pole Flat Campground to Jordan Creek, and is approximately 6 miles in length. The Yankee Fork project area is located within Segment A, and is very near its boundary with Segment B.

The inclusion of historic ORVs for Yankee Fork River Segments A and B were recognized primarily in Segment B, based on the presence of the features and structures listed above that are potentially eligible for listing on the National Register of Historic Places. At the Yankee Fork weir facility, nearby dredge tailings and segments of the historic Yankee Fork Road are features of consideration. These features, however, were not addressed in the USFS analysis (USFS 1989), which focused on buildings, town and village sites, and other features distant from the Yankee Fork weir facility location. There has been no measurable change to the historic features described in the 1989 document, and the value of their contribution to Yankee Fork's eligibility as a Wild and Scenic River has endured since that analysis.

Cultural values were not specifically recognized in the 1989 eligibility determination, apart from being combined with the historic values for Segment B. Cultural values were, however, included in the list of ORVs for Segment A in the National Rivers Inventory, although the description was limited to a summary statement that included "religious and ceremonial fishery." For the purposes of this analysis, impacts on both the cultural sites present along Segment B and the Tribal cultural values associated with traditions tied to traditional fish harvesting (applicable to Segment A) will be evaluated.

[1] Panther Creek is also considered eligible under the "Recreation" classification for Wild and Scenic Rivers (USFS 1989; see Section 3.1, *Land Use and Recreation*); however, it is not considered eligible under the "Historic" classification and, therefore, is not discussed in this section as a Wild and Scenic River.

### Identified Cultural Resources at Yankee Fork

Three cultural resources were identified in the analysis area for the Yankee Fork site. One of these resources was previously recorded by a prior cultural resources survey and consists of the dredge tailings from the placer mining operations along the Yankee Fork River (McDaniel et al. 2013). A portion of the Yankee Fork Gold Dredge Tailings occurs at the northern edge of the Yankee Fork analysis area. The Snake River Mining Company and others conducted large-scale placer mining operations along the Yankee Fork River between the analysis area and the town of Bonanza from the late 1930s through the early 1950s. The other two identified resources were a segment of the former Stanley to Bonanza Wagon Road, first established in the 1880s, and a segment of the Custer Motorway Adventure Road, built by the Civilian Conservation Corps in the 1930s (Walsworth 2002c; Walsworth 2002a). Both road segments are encompassed by the existing Yankee Fork Road, which bisects the Yankee Fork analysis area, and were previously recorded by prior cultural resources studies.

Five other cultural resources have been previously recorded within 1 mile of the Yankee Fork analysis area. These resources include: a transmission line segment located approximately 0.5 miles southeast of the analysis area; the Flat Rock Campground located approximately 1 mile south of the analysis area; a precontact archaeological site, consisting of a lithic scatter, located approximately 1 mile south of the analysis area; and two rusted metal cans located approximately 0.5 and 1 miles east and southeast of the analysis area, respectively (Harrison and McDaniel 1987; Walsworth and Arkush 2002a; Walsworth and Arkush 2002b; Walsworth 2002b).

## 3.9.1.6 Panther Creek Weir Facility

The Panther Creek analysis area is located on a valley bottom and extends across four landform types, including an active stream channel, floodplains, terraces, and talus slopes. The entire area seems to have been subject to several widespread ground disturbing activities, including clearing, road and building construction, and buried utility installation. It is currently being used as a ranger station and a livestock holding area. Both Panther Creek and the current alignment of Panther Creek Road bisect the analysis area.

The Panther Creek analysis area is in the vicinity of the USFS Cobalt Administrative Site. The facility was originally known as the Copper Creek Ranger Station within the Challis National Forest. Copper Creek itself was so named because of the partial development of a copper mine at its head sometime in the late nineteenth century (Vagstad 1979). The Challis National Forest was created in 1908 from parts of the Salmon River and Sawtooth national forests. The Salmon and Challis national forests were placed under joint management in May 1994 and formally consolidated to become the Salmon-Challis National Forest in 1998 (Wilson 2011: 15, 18–19).

The land for the Copper Creek Ranger Station was initially surveyed and set aside by the USFS in 1910. It was later selected as the agency headquarters for the Copper Creek District due to its central location (Vagstad 1979). The survey and establishment of the ranger station may have been influenced, at least in part, by the Great Fire of 1910 that devastated approximately 3 million acres of forest land in northeast Washington, northern Idaho, and western Montana. The Great Fire of 1910 prompted the growth and development of the USFS—which at the time was a newly established department on the verge of cancellation—and significantly affected forestry practices. After the fire, it was decided that the USFS was to prevent and battle against every wildfire, a practice that required the construction of new facilities (Egan 2009).

Construction of the first buildings at the Copper Creek Ranger Station began in 1920. In 1933 to1934, several of the existing buildings were either removed or replaced by new facilities constructed by the Civilian Conservation Corps. Following World War II, electrical, plumbing, and sewage systems were added to the Copper Creek Ranger Station and the 1930s-era buildings were upgraded to accommodate these changes. In the 1940s and 1950s additional improvements were made to the facilities, and ongoing maintenance and upkeep continued into the 1990s. The facility was renamed the Cobalt District Ranger Station in 1958 to reflect a change in the forest district name, and it transitioned from a headquarters facility to a seasonal work center in 1995 (Vagstad 1979; Wilson 2011: 196–200).

Many of the Copper Creek Ranger Station's original 1930s-era buildings still exist as part of the working facility, which continues to be administered and maintained by the USFS. Most of the existing buildings are situated on the west side of Panther Creek near the mouth of Dummy Creek, a small stream that flows into Panther Creek from the west (Vagstad 1979; Wilson 2011: 196–200).

Other prior development in the vicinity of the Panther Creek analysis area primarily consists of road and trail systems developed to support mining and timber harvesting activities in the area, and later to provide interior access to the national forest. The former town of Cobalt, Idaho, exists approximately 3 miles northeast from the Panther Creek analysis area, downstream from the project site. In the late nineteenth and early twentieth centuries, this town was one of several mining communities that dotted what is now the Salmon-Challis National Forest. These communities were accessible by a series of mountain trails and wagon roads cut through the region, the paths of which many current roads and highways now follow.

The Thunder Mountain Trail was the primary road through the mountains during this period. It was initially completed in 1895, running from Salmon City, Idaho, to Forney, Idaho. Passing through the Panther Creek valley, it served as a dirt road and pack route for the miners and tradesmen of the Thunder Mountain mining district. The route was promoted by the Oregon Short Line Railroad in 1902 and remained in use until about 1909, when the area's last major mining boom went bust (Matz 1996).

Today, Panther Creek Road generally follows the route of the former wagon road in the vicinity of the analysis area. The existing Panther Creek Road, also known as National Forest Service Road 55, was constructed through the vicinity by the Civilian Conservation Corps in 1933. The road was built over several sections of the former Thunder Mountain Trail, including through the analysis area. The road was again upgraded in 1950 to support mining and logging truck traffic in the Cobalt area, and has since been continually improved and maintained to modern standards (Olson 1995; Dickerson 2005).

### Identified Cultural Resources at Panther Creek

Three cultural resources were identified in the analysis area for the Panther Creek site. These resources include the alignment of the former Thunder Mountain Trail, a segment of Panther Creek Road, and the Cobalt Administrative Site, consisting of historic buildings associated with a USFS administrative site with a secondary precontact archaeological site component consisting of a buried low-density lithic scatter (Matz 1990; Olson 1995; Vagstad 1979; Townsend 1984). Segments of the Thunder Mountain Trail, Panther Creek Road, and the Cobalt Administrative Site were previously recorded by prior cultural resources studies. All three resources have undergone changes that have affected their physical integrity (the ability of the property to convey its significance through physical features and context). The buried low-density lithic scatter was determined to be part of a previously documented archaeological site in the vicinity of the analysis area (Vagstad 1979).

Two other cultural resources have been previously recorded within 1 mile of the Panther Creek analysis area. These resources include the remnants of the Panther Creek Inn, an historical homestead and inn located approximately 1 mile north of the analysis area, and a precontact talus pit located approximately 0.5 mile north of the analysis area (Tucker 1998; Hoffert 1996).

## 3.9.2 Environmental Consequences

The following sections describe the potential direct and indirect impacts related to cultural resources that would result from construction and operation of Alternatives 1 and 2 and the No Action Alternative. Examples of actions that could lead to impacts on cultural resources include excavations associated with project-related construction of the hatchery and weir facilities and infrastructure, as well as increased construction-related vehicular traffic.

### 3.9.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

##### Construction

Cultural resources investigations identified one resource in the Crystal Springs hatchery area: the former Crystal Springs Trout Farm #3 (Galm 1997). Features associated with the former Crystal Springs Trout Farm #3, including artesian springs/wells, concrete raceways, an incubator building, and holding ponds, are located beyond the limits of the proposed footprint at the Crystal Springs hatchery site. Therefore, no direct impacts on this resource are expected. Water pump remnants, likewise thought to be associated with the hatchery, are located in the south-central portion of the analysis area. No other buildings or infrastructure were identified. Although the construction and increased pedestrian use or vehicular activity in the area would indirectly impact the former Crystal Springs Trout Farm #3, the level of impact is expected to be **low** because these impacts are anticipated to be minor and temporary.

##### Operations

Operations under Alternative 1 would not affect the Crystal Springs Trout Farm #3. The use of the proposed Crystal Springs hatchery facility would be consistent with the use of the previous Crystal Springs Trout Farm #3; therefore, direct and indirect impacts on cultural resources as a result of operations would be **low**.

#### Yankee Fork Weir Facility

##### Construction

Construction of the Yankee Fork weir facility would require ground disturbance to a depth of approximately 8 feet that would have the potential to impact cultural resources if present. This ground disturbance includes excavation for the adult holding ponds, involving a depth of up to 8 feet of excavation for one pre-sort pond, measuring 6 feet wide and 32 feet long, and two post-sort ponds, measuring 10 feet wide and 32 feet long. Additional excavation would take place in the streambed below the bridge weir, involving ground disturbance of approximately 7 feet to install a

U-shaped pre-cast concrete section for a concrete sill that picket panels would drop into from above. Cultural resources investigations identified three resources in the Yankee Fork analysis area, including a portion of the Yankee Fork Gold Dredge Tailings, a segment of the former Stanley to Bonanza Wagon Road, and a segment of the Custer Motorway Adventure Road (McDaniel et al. 2013; Walsworth 2002c; Walsworth 2002a). Project-related ground disturbance would be limited to the footprint of an existing road and culvert that already pass through the Yankee Fork Gold Dredge Tailings. As a result, Alternative 1 would not directly or indirectly impact this resource. About 425 feet of the existing paved Yankee Fork Road would be removed and a new 675-foot paved section of road would replace it, curving around the east side of the facility and including three new access points to the facility, parking area, and Pole Flat Campground. As a result, the Stanley to Bonanza Wagon Road and Custer Motorway Adventure Road segments recorded within the work area would be directly impacted; due to determined ineligibility, these impacts would not affect eligibility and can be considered **low** impact. Materials staging and stockpile locations would be sited within the project work area either on developed surfaces (e.g., parking areas) or in areas to be disturbed for facilities construction. Indirect impacts may result from increased pedestrian or vehicular activity in the area, confined to existing or new paved and gravel surfaces, which would be a **low** impact.

### Operations

During operation, permanent features in the water (e.g., picket panels, concrete abutments, fish ladder) and adjacent to Yankee Fork Road and Pole Flat Campground would be visible in the area, including chain link fencing around facilities and safety railings around holding ponds. The facility would be staffed by two individuals from May to October to operate the fish weir, and access roads to the facility would be gravel surfaced. Impacts would be **low**, and would result from minimally increased pedestrian or vehicular activity in the area associated with facility staff and facility operations. This activity would be confined largely to established paved and gravel surfaces and confined facility operation areas.

### Wild and Scenic Rivers Act

The construction and operations of the Yankee Fork weir facility would not result in any impacts on the historic ORV. USFS's 1989 evaluation (USFS 1989) was focused on structures, town and village sites, and cemeteries along Segment B of Yankee Fork. Alternative 1 would not affect these resources as there are none present in the project area. The only impact on historic values would be the relocation of Yankee Fork Road, which overlaps portions of the historic Stanley to Bonanza Wagon Road and the Custer Motorway Adventure Road segment. Both historic road segments were determined to lack integrity within the project area to warrant protection; therefore, there would be no impact on the eligibility of Yankee Fork's potential for Wild and Scenic River status.

Similar to the discussion under the historic ORV, no cultural sites eligible for listing on the National Register of Historic Places were identified within the Yankee Fork analysis area; therefore, the construction and operations of the Yankee Fork weir facilities would not result in impacts on the cultural ORV. There would, however, be positive effects on the Tribes' cultural values as they relate to fish and fishing. Implementation of Alternative 1 would help enable the Tribes to better meet their obligations to protect, preserve, and enhance native species of significant cultural value by better ensuring the Tribes have opportunities to harvest salmon in Yankee Fork and Panther Creek. Depressed salmon runs have limited harvest opportunities for contemporary Tribal members, who have continued to harvest fish under rights reserved by the Fort Bridger Treaty of 1868.

Historically, Tribes have harvested these species throughout the Columbia River Basin, and contemporary salmon abundance is estimated at 0.5% in the upper Salmon River subbasin compared to historic populations (Shoshone-Bannock Tribes 2013). Successful implementation of the Yankee Fork weir facility coupled with operations of the Hatchery Program as a whole would have a **low** impact on the cultural ORV considered for Yankee Fork Segment A's eligibility as a Wild and Scenic River.

## Panther Creek Weir Facility

### Construction

Construction of the Panther Creek weir facilities would require ground disturbance to a depth of approximately 8 feet that has the potential to impact cultural resources if present. This ground disturbance includes excavation for the adult holding ponds, involving a depth of up to 8 feet of excavation for one pre-sort pond, measuring 6 feet wide and 32 feet long, and two post-sort ponds, measuring 10 feet wide and 32 feet long. Additional excavation would take place in the streambed below the bridge weir, involving ground disturbance of approximately 7 feet to install a U-shaped pre-cast concrete section for a concrete sill that picket panels would drop into from above. Cultural resources investigations identified three resources in the Panther Creek analysis area, including segments of the Thunder Mountain Trail and Panther Creek Road, and part of the Cobalt Administrative site, which includes historic buildings and a secondary component of a prehistoric archaeological site (Matz 1990; Olson 1995; Townsend 1984; Vagstad 1979).

The Cobalt Administrative Site lies outside the immediate footprint of Alternative 1 and is not expected to incur any direct impacts as a result of its construction. Following the identification of the Cobalt Administrative Site, Alternatives 1 and 2 were redesigned to avoid this archaeological site. Because of this avoidance, neither Alternative 1 nor 2 would directly or indirectly impact this resource.

Segments of the Thunder Mountain Trail and Panther Creek Road are both located within the project area and would be impacted by Alternatives 1 and 2. These impacts would include increased construction-related vehicle traffic and construction of the weir facilities. However, no substantial changes to these segments are anticipated. Therefore, impacts on these resources by either of the alternatives are expected to be **low**.

### Operations

During operation, permanent features in the water (e.g., picket panels, concrete abutments, fish ladder) and adjacent to the Cobalt Administrative Site, segments of the Thunder Mountain Trail, and Panther Creek Road would be visible in the area. Impacts would be **low**, and would result from minimally increased pedestrian or vehicular activity in the area associated with facility staff and facility operations. This activity would be confined largely to established paved or gravel roads and confined facility operation areas.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Because the footprint of the hatchery facilities would be the same under both full production and the reduced production option, impacts on cultural resources would be the same. Construction and increased pedestrian use or vehicular activity in the area would indirectly impact the former Crystal Springs Trout Farm #3; however, the level of impact is expected to be **low** because these impacts are anticipated to be minor and temporary.

Although production of Chinook salmon would be reduced by 50%, operational impacts on cultural resources would be essentially the same as that described for full production under Alternative 1. Operations under the reduced production option would not affect the Crystal Springs Trout Farm #3 because the use of the proposed Crystal Springs hatchery facility would be consistent with the use of the previous Crystal Springs Trout Farm #3. Cultural resources would continue to be avoided during operational activities, and indirect impacts resulting from increased pedestrian or vehicular activity in the area would be **low**. No direct impacts are expected to occur.

#### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, construction-related impacts on cultural resources would also be the same. Impacts would include increased construction-related vehicle traffic and construction of the weir facilities; however, nearby cultural resources would not be affected. Impacts on cultural resources during construction of the weir facilities for the reduced production option are anticipated to be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Cultural resources would continue to be avoided during weir facility operations, and impacts resulting from increased pedestrian or vehicular activity in the area would be **low**.

## 3.9.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts on cultural resources at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

#### Construction

Under Alternative 2, the Tribes would continue to use the existing temporary weir, and not install permanent features in Yankee Fork or adjacent to the Pole Creek Campground. The existing land use would persist, with only temporary disturbance to the Yankee Fork and disruptions at the staging area outside the Pole Flat Campground when the temporary weir is set up from June to September. Project-related ground disturbance would be limited to the footprint of an existing road and culvert that already pass through the Yankee Fork Gold Dredge Tailings. Therefore, impacts on cultural resources would be **low,** and would be confined largely to existing paved and gravel surfaces and to limited work areas adjacent to the temporary weir.

#### Operations

Impacts would have **low** impacts on cultural resources from minimally increased pedestrian and vehicular activity in the area, which would be largely confined to paved and gravel surfaces in established work areas, with staff members using the nearby Pole Flat Campground as temporary residence during field season.

#### Wild and Scenic Rivers Act

Under Alternative 2, impacts on historic and cultural ORVs would be the same as under Alternative 1. Successful implementation of the Yankee Fork weir facility, along with operations of the Hatchery Program, would help enable the Tribes to better meet their obligations to protect, preserve, and enhance native species of significant cultural value by better ensuring the Tribes have opportunities to harvest salmon in Yankee Fork and Panther Creek. This would be a **low** impact on the cultural ORV considered for Yankee Fork Segment A's eligibility as a Wild and Scenic River.

### Panther Creek Weir Facility

#### Construction

Under Alternative 2, the Tribes would install a temporary weir. The impacts on the Cobalt Work Center would expected to be low, as it lies outside the footprint of Alternative 2.

Segments of the Thunder Mountain Trail and Panther Creek Road are both located within the project area and would be impacted by Alternative 2. These impacts would include increased construction-related vehicle traffic and construction of the weir facilities. However, no substantial changes to these segments are anticipated. Therefore, impacts on these resources by either of the alternatives are expected to be **low** because increased pedestrian and vehicular activity in the area would be confined largely to paved and gravel surfaces and to limited work areas adjacent to the temporary weir.

#### Operations

The temporary weir would include a picket weir and adult trap, with no structures being constructed on land. There would be **low** impacts on all of the resources from minimally increased pedestrian and vehicular activity in the area, which would be confined largely to existing paved and gravel surfaces, with staff activities largely confined to work areas, and to a temporary campsite at the nearby Cobalt Work Center during the field season.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for 50% production under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weir at the Yankee Fork and Panther Creek sites. As a result, there would be **no** construction-related impacts on cultural resources.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Cultural resources would continue to be avoided during weir facility operations, and impacts resulting from increased pedestrian or vehicular activity in the area would be **low**.

# 3.9.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on cultural resources during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.9.3.1 Alternative 1

### Construction

The following mitigation measures would be implemented to avoid or minimize impacts on cultural resources during construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:

- Mark known cultural resource sites as avoidance areas on construction drawings and flag as no-work areas in the field prior to construction.
- Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan.
- Protect any unanticipated cultural resources discovered during construction as follows:
    - Stop work in the immediate vicinity of the discovery and protect find in place.
    - Notify Tribes Project Manager, BPA Archaeologist, and BPA Environmental Compliance Lead immediately; for activities on Salmon-Challis National Forest Lands, notify the Forest Archaeologist.

- Implement mitigation or other measures as instructed by BPA in consultation with the Tribes, Salmon-Challis National Forest, and Idaho State Historic Preservation Office.

#### Operations

No mitigation would be recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1.

### 3.9.3.2 Alternative 2

#### Construction

The same mitigation described for construction of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 1 would also be implemented for Alternative 2.

#### Operations

No mitigation would be recommended for operation of the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility under Alternative 2.

## 3.9.4 No Action Alternative

Under the No Action Alternative, the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility would not be constructed. Existing conditions would continue, and **no** impacts on cultural resources related to the construction or operations of the Hatchery Program would occur. Additionally, under the No Action Alternative, the harvest and cultural benefits of the proposed Hatchery Program—including providing enough returning fish to meet Tribal harvest objectives and support a naturally spawning population of Chinook salmon in Yankee Fork and Panther Creek, as well as providing a harvestable Yellowstone cutthroat trout population in the Fort Hall bottoms—would not occur.

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# 3.10 Socioeconomics and Environmental Justice

This section describes the affected environment and environmental consequences, including mitigation measures, associated with socioeconomics and environmental justice resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the hatchery under two Chinook salmon production level options: the proposed production level (production of up to 1 million smolts), and a 50% production level.

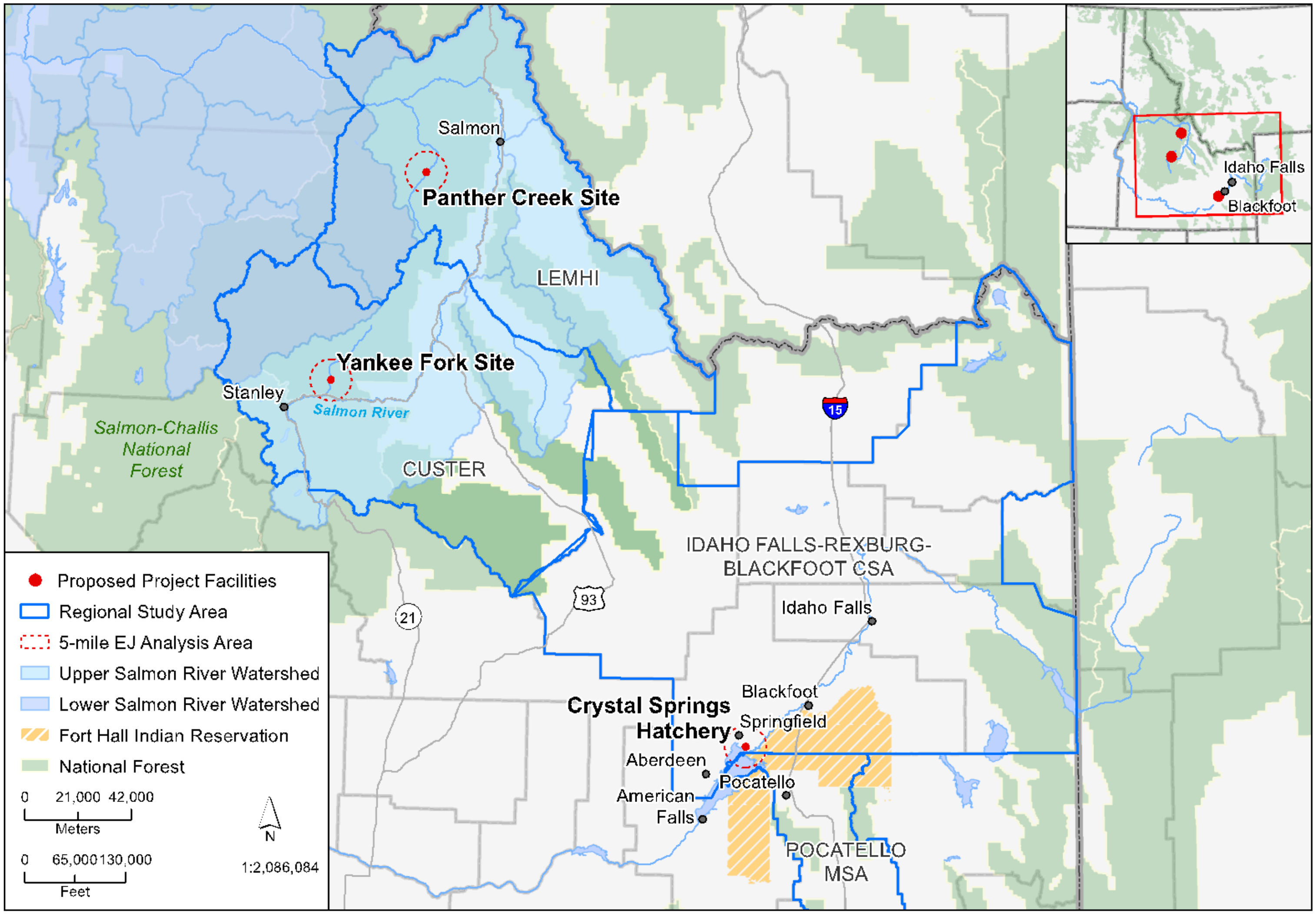
## 3.10.1 Affected Environment

The potential impacts of the Hatchery Program would occur at several geographic scales, so multiple analysis areas are used in the socioeconomic analysis. The economic impacts (e.g., employment and income) associated with construction and operation of Alternatives 1 and 2 would generate primary and secondary impacts that would flow through the economy of the region surrounding the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility sites. The analysis area that captures this economic activity is a composite of geographic areas delineated by the U.S. Census Bureau, comprised of the counties in southeast and central Idaho where the sites are located: Lemhi, Custer, and Bingham, along with the Idaho Falls-Rexburg-Blackfoot combined statistical area (CSA) (which includes Bingham County) and the Pocatello Metropolitan Statistical Area (MSA). The Fort Hall Indian Reservation is included within these areas. This analysis area is referred to throughout this section as the regional study area (Figure 3.10-1).

The socioeconomic impacts arising from changes in fish populations are analyzed at a watershed scale, which encompasses all fisheries that Alternatives 1 and 2 would affect, from the Pacific Ocean to the upper reaches of the Upper Salmon River watershed, where the Crystal Springs hatchery and the Yankee Fork and Panther Creek weir facilities are located. Additionally, this analysis area includes the Tribal land where the Shoshone-Bannock Tribes (Tribes) would harvest Yellowstone cutthroat trout for cultural and recreational activities. This analysis area is larger than the regional study area, encompassing the entire Salmon River watershed and downstream portions of the Columbia River basin, (Figure 3.10-2) as well as the Fort Hall Bottoms on the Fort Hall Indian Reservation where the cutthroat trout fishery is located.

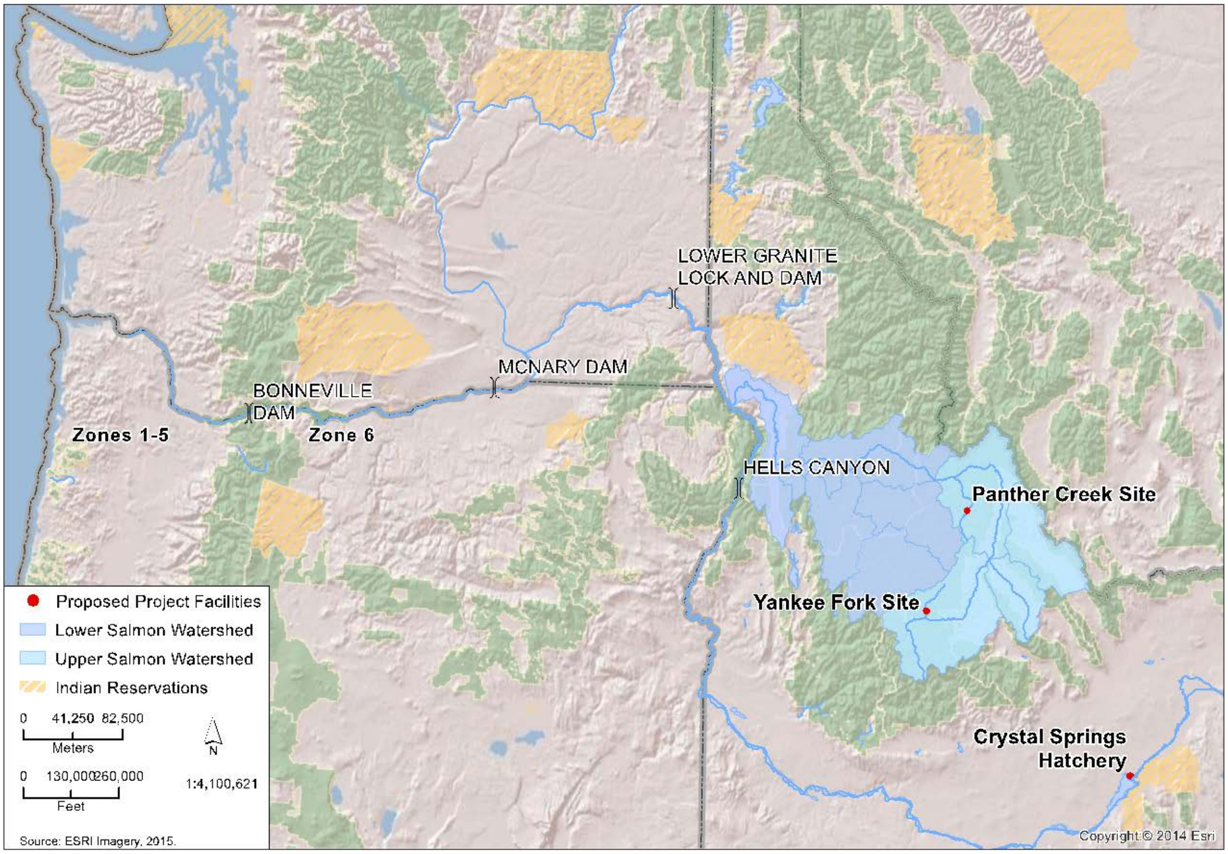
The analysis area for environmental justice incorporates the Census block groups that intersect with a 5-mile radius surrounding the hatchery facility and each weir facility location. The 5-mile radius captures the populations and communities within which any expected adverse impacts are most likely to arise from construction and operation of Alternatives 1 and 2 (e.g., populations residing within communities where public services may be stressed, or where housing demand may increase beyond available supply). Beneficial socioeconomic impacts associated with increasing fish populations are likely to affect environmental justice populations within a much larger area (e.g., all members of the Tribes). These beneficial impacts are addressed qualitatively in the environmental justice analysis for all relevant populations within and outside of the environmental justice analysis area. Figure 3.10-1 shows these analysis areas, and the localities and site facilities referred to in the analysis.

**Figure 3.10-1. Map of the Analysis Areas**




Source: Google My Maps geocoding services, 2015; U.S. Census Bureau (2013a) TIGER/Line GIS boundary data, 2010; IDWR GIS boundary data, 2014; U.S. Forest Service GIS boundary data, 2015

**Figure 3.10-2. Fisheries Potentially Affected by the Crystal Springs Hatchery Program**




Source: Google My Maps geocoding services 2015; U.S. Census Bureau (2013a) TIGER/Line GIS boundary data 2010; Idaho Department of Water Resources GIS boundary data 2014; U.S. Forest Service GIS boundary data 2015; Environmental Systems Research Institute.

## 3.10.1.1 Population

The Hatchery Program would be located in three different counties in Idaho. The site proposed for the Crystal Springs hatchery is located in southern Idaho, in a rural area of Bingham County. The closest community to the proposed site is Springfield, which is approximately 2.9 miles to the northwest. Springfield is an unincorporated community located with a population of 111 residents (U.S. Census Bureau 2014a). The entire population of Bingham County is 45,290, with the City of Blackfoot as the county's seat and largest population center. The site proposed for the Yankee Fork weir facility is located in Custer County within the Salmon-Challis National Forest. The nearest community is Stanley, Idaho, which has a population of less than 100. The site proposed for the Panther Creek weir facility is located in Lemhi County, also within the Salmon-Challis National Forest. It is very remote; the nearest population center, Salmon, Idaho, is about two hours driving time away and has a population of about 3,000 (U.S. Census Bureau 2014a).

The regional study area, which includes both rural and urban areas, has a population of 327,950. The majority of the population in the study region is located in Idaho Falls and Pocatello, approximately 40 miles from the proposed Crystal Springs hatchery and approximately 200 miles from the Yankee Fork and Panther Creek sites.

Table 3.10-1 shows the current and historic population data for the regional study area and component geographical areas used to measure the socioeconomic effects of the Hatchery Program. The population trend in the study region was approximately 1.5% growth between 2000 and 2013; however, most of the in-migration occurred in urban areas, with Idaho Falls absorbing the largest number of new residents. Rural areas in Custer and Lemhi Counties experienced neutral to negative population growth over the same period.

**Table 3.10-1. Population and Population Change of Regional Study Area, 2000–2013**

| Geographic Region | 2000 | 2013 | Percent Change (%) | Average Annual Growth Rate (%) |
|---|---|---|---|---|
| Regional Study Area | 273,884 | 327,950 | 19.7 | 1.5 |
| Idaho Falls-Rexburg-Blackfoot CSA | 186,096 | 232,740 | 25.1 | 1.9 |
| Pocatello MSA | 75,728 | 83,249 | 9.9 | 0.8 |
| Custer County | 4,336 | 4,249 | -2.0 | -0.2 |
| Lemhi County | 7,724 | 7,712 | -0.2 | 0.0 |

Source: U.S. Census Bureau 2014a

### 3.10.1.2 Employment

In 2013, approximately 179,000 people age 16 years and older were employed either full-time or part-time in the regional study area. Table 3.10-2 shows the total employment of residents in the region between 2000 and 2014. The Idaho Falls Metropolitan Area accounted for about 81,000 employed people or 45% of total employment in the regional study area.

**Table 3.10-2. Total Employment in the Regional Study Area, 2000–2013**

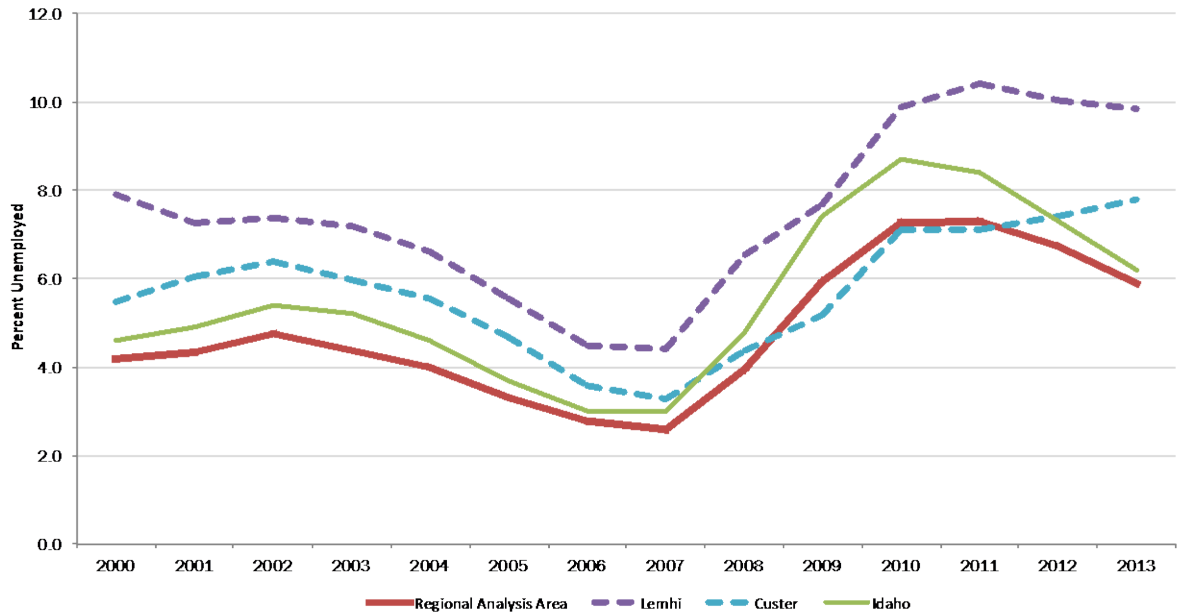
| Geographic Region | 2000 | 2013 | Percent Change (%) |
|---|---|---|---|
| Regional Study Area | 155,310 | 178,965 | 15.2 |
| Idaho Falls-Rexburg-Blackfoot CSA | 105,929 | 127,152 | 20.0 |
| Pocatello MSA | 42,449 | 44,739 | 5.4 |
| Custer County | 2,604 | 2,933 | 12.6 |
| Lemhi County | 4,328 | 4,141 | -4.3 |

Source: U.S. Bureau of Economic Analysis 2014a

While most of the areas in the region saw positive job growth between 2000 and 2013, employment in Lemhi County shrank by about 200, or approximately 4.3% of jobs in the area. Based on available data from the Bureau of Economic Analysis, it appears that the majority of job losses in Lemhi County were in real estate and local government (U.S. Bureau of Economic Analysis 2014a).

Figure 3.10-3 illustrates the unemployment rate for the regional study area and the State of Idaho. The unemployment rate in the study rose sharply during the national economic recession in 2009 and peaked at 7.3% in 2010. Since 2011, however, the unemployment rate for the regional study area has started to decline, though it remains above the historical average for the region. Taken as a single economic region, the regional study area maintains a lower average unemployment rate than the state as a whole.

**Figure 3.10-3. Unemployment Rate in the Regional Study Area, 2000–2013**

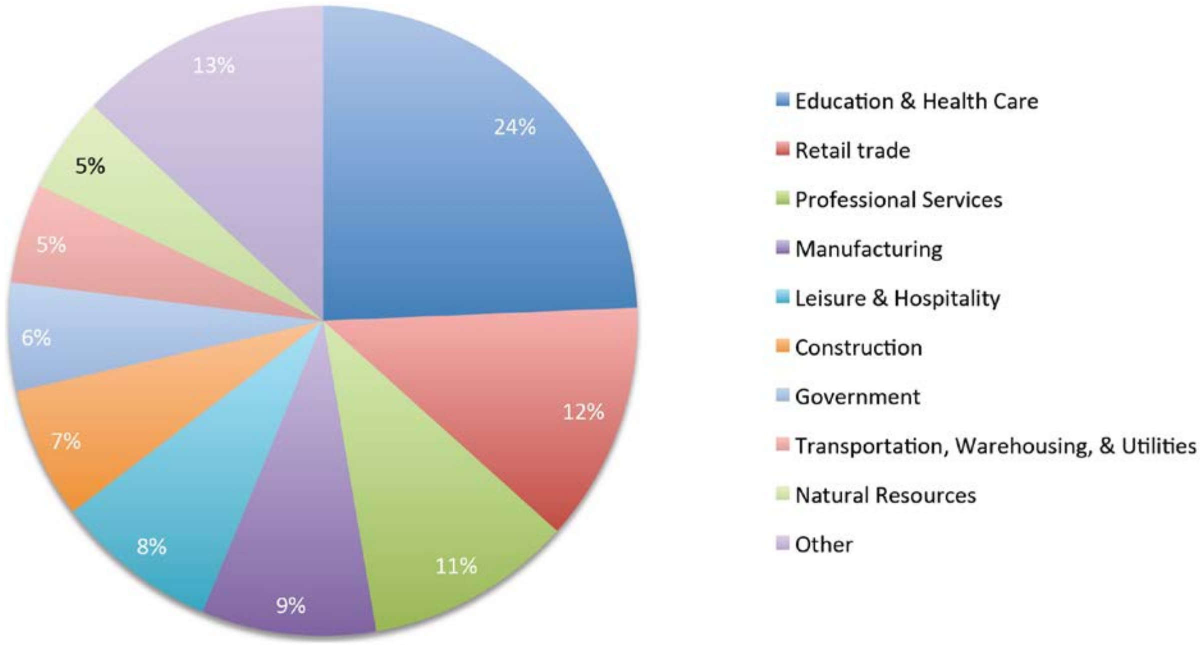



Source: U.S. Bureau of Labor Statistics 2015

It is worth noting, however, that this single metric obscures the differences in employment between the urban and rural areas of the regional study area. The unemployment rate in Lemhi County averages almost 3 percentage points higher than the overall regional study area, and approximately 2 percentage points higher than the state overall. Additionally, although the unemployment rate for the regional study area has started to decline, unemployment in Lemhi County is declining more slowly, while the unemployment rate in Custer County has started to increase since 2011.

Figure 3.10-4 shows the average employment by sector in the regional study area between 2009 and 2013. The pattern in the regional study area generally reflects the overall pattern of employment in Idaho with education and health care, retail, and professional services as the largest sectors for employment. Custer and Lemhi Counties are more rural than the regional study area overall and have a greater proportion of workers employed in the natural resources and farming industries.

**Figure 3.10-4. Total Employment by Sector in the Regional Study Area, 2009–2013**




Source: U.S. Census Bureau. 2014a.
Note: The "Other" category includes Information, Wholesale, Finance, and Other Services

From 2000 through 2013, the sectors that experienced the most rapid growth in the region were real estate, health care, and recreation. This generally follows the changing pattern of employment seen across the rest of Idaho as well during the intervening period. While there is likely some degree of variation between the component geographies identified in the regional study area, the U.S. Bureau of Economic Analysis is unable to provide reliable estimates due to small sample sizes and disclosure restrictions.

### 3.10.1.3 Income

In 2013, per capita personal income was $33,090 in the study region. This income estimate is slightly below the overall state per capita estimate of $36,146. Table 3.10-3 shows the per capita income estimates across the component regions in the regional study area. Between 2000 and 2013, per capita personal income increased across all component regions in the regional study area. While the per capita income remains slightly below the state average, the regional study area experienced a higher per capita growth (34.9%) than the state overall (30%).

**Table 3.10-3. Per Capita Personal Income in the Regional Study Area, 2000–2013**

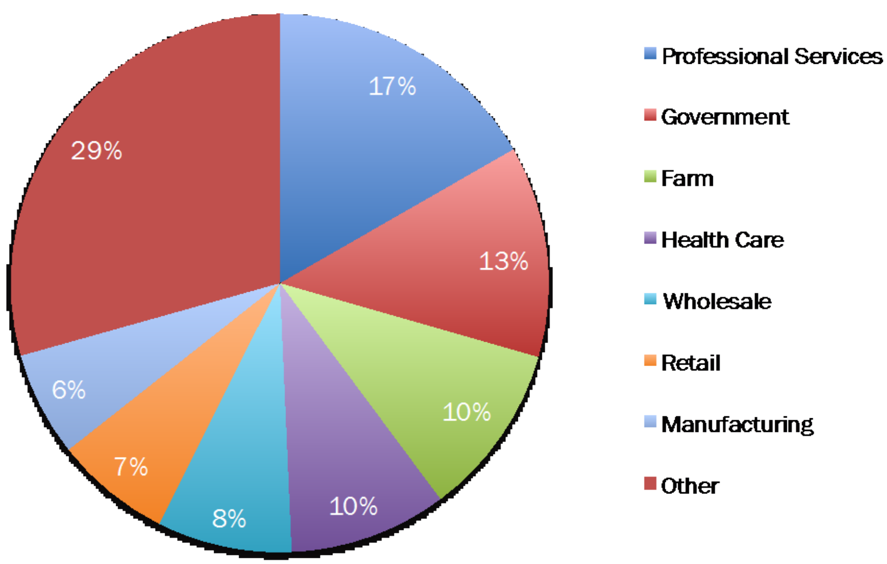
| Geographic Region | 2000 | 2013 | Percent Change (%) | Average Annual Growth Rate (%) |
|---|---|---|---|---|
| Regional Study Area | 21,550 | 33,090 | 34.9 | 4.1 |
| Idaho Falls-Rexburg-Blackfoot CSA | 21,472 | 33,744 | 36.4 | 4.4 |
| Pocatello MSA | 21,775 | 30,926 | 29.6 | 3.2 |
| Custer County | 21,995 | 35,466 | 38.0 | 4.7 |
| Lemhi County | 20,985 | 35,391 | 40.7 | 5.3 |

Source: U.S. Bureau of Economic Analysis 2014b

Both Custer and Lemhi Counties appear to have higher per capita income estimates and higher income growth than the regional study area as a whole. Data limitations due to small sample sizes that restrict public disclosure of economic data make it difficult to identify the precise reasons for this result. Available data from the U.S. Census Bureau and U.S. Bureau of Economic Analysis (2014a, 2014b, 2014c) suggest that population declines, coupled with wage growth in highly productive industries such as healthcare, may explain the larger growth in per capita wages in Custer and Lemhi Counties.

Figure 3.10-5 illustrates the total earnings by sector in the Idaho Falls-Rexburg-Blackfoot CSA. Due to non-disclosure restrictions, much of the earnings data are not available through the U.S. Bureau of Economic Analysis Local Area Personal Income database. In the most populous areas, professional services is the largest single sector for personal earnings. This includes various engineering, legal, and accounting services.

**Figure 3.10-5. Total Earnings by Sector in the Idaho Falls-Rexburg-Blackfoot CSA, 2013**




Source: U.S. Bureau of Economic Analysis 2014c

Note: This figure uses the Idaho Falls-Rexburg-Blackfoot CSA because data were not consistently available at the other geographic scales due to disclosure and confidentiality issues.
The “Other” category includes Information, Wholesale, Finance, and Other Services.

Despite a reduction in employment, local government remains a significant source of personal earnings in all the component regions of the regional study area, as does healthcare and wholesale trades. Retail trades are also an important sector of employment, but account for a smaller share of total personal wages, likely due to lower industry wages.

#### 3.10.1.4 Government Revenue

State, county, and local governments rely on revenues from various sources to fund public service projects and programs. In Idaho, the majority of tax revenue derives from individual income, sales/use, and property taxes. Each year, the State of Idaho releases a report that discloses how tax revenues are raised and how those revenues are distributed (Table 3.10-4). Almost 50% of FY2014 revenues distributed from the general fund were used toward public schools, while approximately 25% were used for health and human services.

**Table 3.10-4. Idaho Tax Revenue Sources, FY2014**

| Tax Type | Tax Rate | FY2014 Revenue ($) |
|---|---|---|
| Corporate net income | 7.40% | 217,543,706 |
| Electricity | 0.5 million per kilowatt hour | 1,839,875 |
| Fuels | $0.01 to $0.197 per gallon | 245,310,930 |
| Individual income | 1.6% to 7.4% | 1,654,830,047 |
| Mine license | 1% | 842,686 |
| Sales/use | 6% | 1,369,521,594 |
| Severance | 2.50% | 639 |
| Other | N/A | 74,935,404 |
| Gross Tax Receipts | | 3,564,824,881 |

Source: Idaho State Tax Commission 2014

In Idaho, counties must charge local sales taxes that fall under the Sales and Use Tax Act. Some areas, such as resort towns, have greater discretion over what is taxed and choose to tax lodging and alcohol. In the regional study area, both Stanley and Salmon use this local option sales tax to raise local government revenue at 2.5% and 4%, respectively. Auditorium districts, which include both Idaho Falls and Pocatello, are restricted to charging local sales taxes for lodging only. Both Idaho Falls and Pocatello charge a lodging tax of 5% on hotel and motel room sales.

#### 3.10.1.5 Housing

The potential supply of rental housing is provided in Table 3.10-5 below. The most recent data available are from the American Community Survey (2013) on selected housing characteristics. The overall vacancy rate for the regional study area is approximately 24.5%, but varies widely across the component geographies.

**Table 3.10-5. Rental Housing Availability, 2013**

| Geographic Region | Number of Rental Housing Units | Units Available For Rent | Rental Vacancy Rate (%) |
|---|---|---|---|
| Regional Study Area | 2,209 | 541 | 24.5 |
| Idaho Falls-Rexburg-Blackfoot CSA | 1,182 | 375 | 31.7 |
| Pocatello MSA | 872 | 78 | 8.9 |
| Custer County | 66 | 21 | 31.8 |
| Lemhi County | 89 | 67 | 75.3 |

Source: U.S. Census Bureau 2013b

There are several types of temporary accommodations located within commuting distance of each site. Table 3.10-6 shows the types of accommodation available in the nearest population centers, and campgrounds within a 20-mile radius of each site. There are no temporary accommodations within 20 miles of the proposed Crystal Springs hatchery location. There are several types of accommodations available farther than 20 miles but still within commuting distance to the site, located in or near American Falls, Aberdeen, and Pocatello.

**Table 3.10-6. Temporary Accommodations, by Distance to the Crystal Springs Hatchery Program Facilities**

| Location | Hotels/Motels | RV Parks | Campgrounds | Miles from Hatchery Program Facilities |
|---|---|---|---|---|
| Crystal Springs Hatchery | | | | |
| General Vicinity[a] | – | – | – | 20.0 |
| Springfield | – | – | – | 6.0 |
| Aberdeen | – | – | 1 | 23.0 |
| American Falls | 3 | 1 | 1 | 37.0 |
| Pocatello | 10 | 3 | 1 | 47.0 |
| Yankee Fork Weir Facility | | | | |
| General Vicinity[a] | – | – | 4 | 20.0 |
| Stanley | 20[b] | – | – | 18.0 |
| Panther Creek Weir Facility | | | | |
| General Vicinity[a] | – | – | 5 | 20.0 |
| Salmon | 12 | 7 | 1 | 36.0 |

Source: Google Maps

Notes:

[a] Within a 20-mile radius of the proposed site.

[b] This number represents the number of hotels/motels available during peak visitation months.

There are several campgrounds located near the Yankee Fork site. No visitation data for these campgrounds are available; however, peak use of campgrounds in the area is during the fishing and recreation season months of April through September, when the sites can be completely full throughout the week. Campgrounds are maintained from late May through mid-October, although during warmer years, the campsites can be used through November (Callaghan pers. comm.).

The nearest hotels/motels and RV parks are located about 20 miles away in Stanley. The Stanley area has a strong tourism industry. Many types of temporary visitor accommodations are available, but they book up in advance of the busy summer season. During July and August, temporary lodging can be difficult to find without advanced booking (Libertine pers. comm.).

There are also campgrounds near the Panther Creek site. The nearest hotels/motels and RV parks are located in Salmon, Idaho, about 40 miles away (approximately 1.5–2 hours driving time on the rural roads). Additional lodging options are available in Challis, Idaho. There is generally excess capacity in the area's lodging options, even during the summer months. The exception is early-mid August when a music festival takes place in Challis. During the week of the festival, there is generally no capacity in the hotels or RV parks in the area (De Grado pers. comm.).

### 3.10.1.6 Public Services and Infrastructure

#### Law Enforcement

The regional study area encompasses several jurisdictions that provide law enforcement services. These jurisdictions have per capita rates of law enforcement officers that generally reflect the statewide average of 1.7 officers per 1,000 residents. Table 3.10-7 shows the number of full-time and part-time officers employed in the regional study area.

**Table 3.10-7. Sworn Officers per 1,000 Residents, 2012**

| Geographic Region | Full-Time Officers | Part-Time Officers | Total | Officers per 1,000 Residents |
|---|---|---|---|---|
| Regional Study Area | 810 | 27 | 837 | 1.5 |
| Idaho Falls-Rexburg-Blackfoot CSA | 327 | 6 | 333 | 1.4 |
| Pocatello MSA | 136 | 8 | 144 | 1.7 |
| Custer County | 6 | 6 | 12 | 2.8 |
| Lemhi County | 14 | 1 | 15 | 1.9 |

Source: U.S. Census Bureau 2014b

The Bingham County Sheriff Department provides law enforcement and has jurisdiction over the proposed hatchery site. According the U.S. Census Bureau (2014), in 2012 the Bingham County Sheriff Department had 71 full-time officers and 2 part-time officers. The Idaho State Police also provide patrols, investigations, and forensic services in the regional study area. Custer and Lemhi County Sheriffs' offices provide law enforcement and emergency response services for the county roads leading to the Yankee Fork and Panther Creek sites. U.S. Forest Service (USFS) Law Enforcement provides protection and emergency response on the Salmon-Challis National Forest.

#### Fire Protection

There are several fire departments in the regional study area, both urban and rural, that could potentially lend support to the sites if necessary. Table 3.10-8 shows the aggregate and per capita numbers of full-time and part-time firefighters in the regional study area, and volunteer firefighters for Custer and Lemhi Counties where volunteers make up the majority of firefighting resources.

**Table 3.10-8. Firefighters per 1,000 Residents, 2012**

| Geographic Region | Full-Time Firefighters | Part-Time Firefighters | Volunteer Firefighters | Total | Firefighters per 1,000 Residents |
|---|---|---|---|---|---|
| Regional Study Area | 405 | 443 | [a] | 848 | 1.5 |
| Idaho Falls-Rexburg-Blackfoot CSA | 160 | 185 | [a] | 345 | 1.5 |
| Pocatello MSA | 85 | 55 | [a] | 140 | 1.7 |
| Custer County | 0 | 2 | 112 | 114 | 26[b] |
| Lemhi County | 0 | 16 | 113 | 129 | 15[b] |

Source: U.S. Census Bureau 2014b, FireDepartment.net 2016
Notes:
[a] Data unavailable for these geographies.
[b] Calculated based on 2015 county populations. Other values come directly from the Census.

In the event of a structural fire, the Springfield Fire Department would be the primary responder to the proposed hatchery site, followed by the City of Blackfoot (Rowland pers. comm.). County-level firefighting assets in Bingham County include 26 full-time and 47 part-time firefighters (U.S. Census 2013c), which are supported by volunteers. According to the Bingham County Emergency Operations Plan (2011), wildfires are common in rural parts of the county and typically require coordination from multiple departments. If a wildfire occurs in the region, all firefighting assets are notified and dispatched at the county level by the dispatch center. At the Yankee Fork and Panther Creek sites, USFS would provide primary firefighting response.

## Medical Services

There are 11 medical facilities located in the regional study area, including both of the state's two Level II trauma centers. Table 3.10-9 shows the number of major healthcare facilities in the analysis area.

**Table 3.10-9. Medical Facilities and Physicians, 2012**

| Geographic Region | Number of Facilities | Number of Beds | Trauma Facilities | Physicians per 1,000 Residents |
|---|---|---|---|---|
| Regional Study Area | 11 | 1,231 | -- | 1.2 |
| Idaho Falls-Rexburg-Blackfoot CSA | 7 | 805 | Level II | 1.0 |
| Pocatello MSA | 3 | 408 | Level II | 1.9 |
| Custer County | 0 | 0 | None | 0.0 |
| Lemhi County | 1 | 18 | None | 1.0 |

Source: U.S. Census Bureau 2014b, University of Idaho Extension 2014, Idaho State University 2012

The hospitals in the region coordinate with the fire departments for emergency medical services in the area. The closest emergency care center is the Bingham Memorial Hospital, which is located in Blackfoot. Bingham Memorial Hospital has 27 physicians and 11 supporting clinical staff. The hospital currently has 25 beds and handles an average of 827 visits per month for emergency and critical care (Idaho State University 2012).

### Solid Waste

Bingham County is responsible for providing solid waste disposal for customers in the county. Bingham County maintains three non-municipal landfills and transfer sites located in Aberdeen, Moreland, and Rattlesnake Canyon. All three sites collect and transfer waste based on the type of waste they are permitted to manage. Construction and demolition debris is handled at the Rattlesnake Transfer Site. The debris is then transferred to the Aberdeen Non-Municipal Landfill, which buries solid waste.

Lemhi Sanitation operates the Lemhi County Landfill, which is located 7 miles southeast of Salmon (Gohn pers. comm.). This landfill accepts municipal solid waste, as well as construction materials and certain types of hazardous waste. There is no landfill in Custer County. In the vicinity of Stanley and Challis, Blue Mountain Refuse manages four transfer stations to collect waste generated in Custer County. Construction and debris (all construction materials except pressure-treated wood and hazardous waste) is buried at the construction and debris pit located at the transfer station in Challis. There is also a construction and debris collection dumpster at the waste transfer station in Stanley, which is ultimately transported to and buried at the construction and debris pit in Challis. Blue Mountain Refuse transports all other waste to the Lemhi County Landfill in Salmon (Gohn pers. comm.). Another company, Clear Creek Disposal, also collects and disposes of household and construction waste in the vicinity of Stanley. Clear Creek Disposal transports the waste to the Ohio Gulch Transfer Station in Blaine County, where it is then transported to landfills elsewhere in southern Idaho (Tollerup pers. comm.).

### Electricity

Idaho Power provides electricity to the Crystal Springs hatchery site and the Panther Creek site (Stone pers. comm. 2015g). The Salmon River Electric Cooperative, which purchases its power from the Bonneville Power Administration, provides electricity to the Yankee Fork site (Dize pers. comm.).

### Other Utilities and Public Services

Other utilities (e.g., water, wastewater) are provided on site and no hookups to public or community utilities would be required, so they are not included in this analysis. Also not included in this analysis are schools, because Alternatives 1 and 2 are not expected to change demand for or supply of this public service.

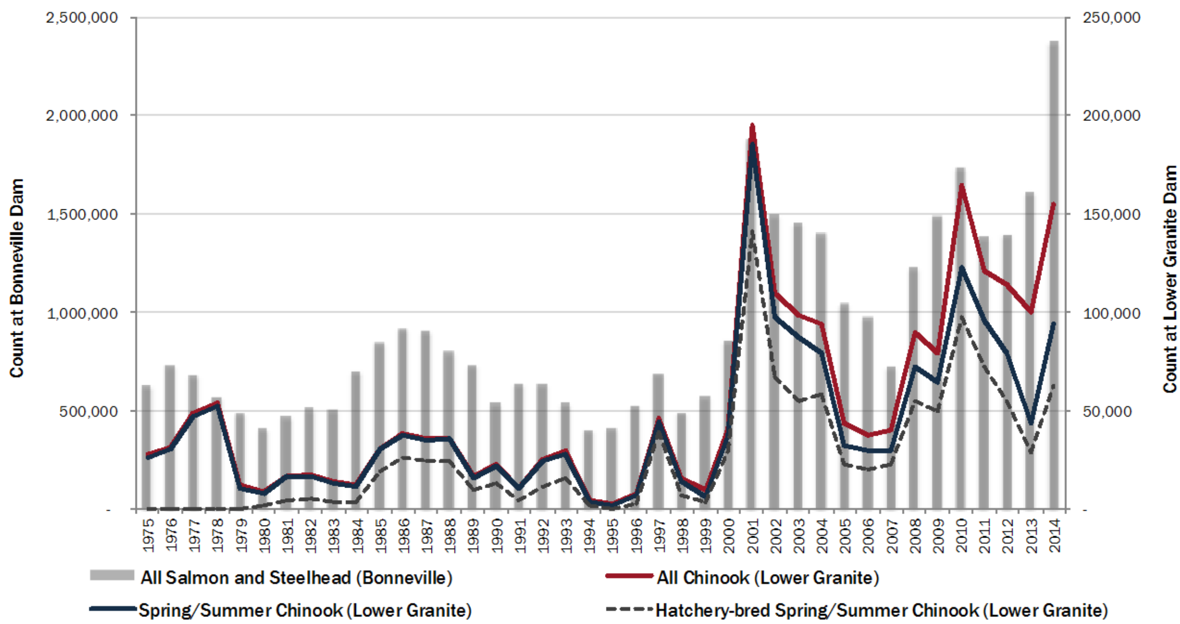
## 3.10.1.7 Use and Value of Fish

### Spring/Summer-Run Chinook Salmon

Salmon populations declined throughout the Columbia River basin during the 19$^{th}$ and 20$^{th}$ centuries due to harvest pressures, hydropower development, and habitat degradation. Prior to European settlement, an estimated 7 to 16 million salmon populated the Columbia River basin (Committee on Protection and Management of Pacific Northwest Anadromous Salmonids 1996). Current salmon abundance in the Upper Salmon River basin is estimated at about 0.5% of historical runs (NPCC 2012).

Figure 3.10-6 shows the total number of adult Chinook salmon and steelhead passing Bonneville Dam each year since 1975, as well as the total number of adult Chinook salmon and adult spring/summer Chinook salmon passing Lower Granite Dam, the final dam before fish reach the Salmon River watershed.[1] Both dams are located on the Columbia River: Bonneville Dam is located approximately 145 miles upriver from the mouth of the Columbia and Lower Granite Dam is approximately 460 miles upriver, near Lewiston, Idaho. Chinook salmon returning to the Salmon River to spawn travel roughly 80 additional river miles beyond Lower Granite Dam to reach the basin. Figure 3.10-2 shows the location of the dams relative to the watersheds relevant to the Hatchery Program.

**Figure 3.10-6. Adult Salmon Passing Bonneville and Lower Granite Dams, 1975–2014**




Source: Fish Passage Center 2015, Joint Columbia River Management Staff 2015

Over the past decade, an average of 1.4 million salmon and steelhead have passed over Bonneville Dam each year (the gray bars in Figure 3.10-6). Of all salmon and steelhead passing Bonneville Dam, on average, about 5% represent adult Chinook salmon that are later counted upstream at Lower Granite Dam (the red line in Figure 3.10-6). Spring/summer Chinook salmon (the blue line in Figure 3.10-6) make up roughly 90% of this number, and the fall runs make up the remainder. According to the 2015 Joint Staff Report, approximately 73% of the spring/summer Chinook salmon that returned to the Snake River system over the past 10 years originated in hatcheries (Joint Columbia River Management Staff 2015).

Spring/summer Chinook salmon that travel past the Lower Granite Dam and into the Idaho portion of the Snake River system are part of the Snake River Spring/Summer Chinook Ecological Significant Unit. This Ecological Significant Unit, designated as ‘threatened’ under the Endangered Species Act, has five major population groupings, one of which is the Upper Salmon River Group. The Upper

[1] Spring/summer Chinook salmon are a subset of total Chinook salmon, and represent a distinct salmon population that migrates and spawns in the spring and summer months.

Salmon River major population grouping in turn comprises nine distinct population segments and corresponding geographical areas (underlined; ICTRT 2009):

- North Fork Salmon River
- Lemhi River
- Salmon River Lower Mainstem (below Redfish Lake Creek)
- Pahsimeroi River
- East Fork Salmon River
- Yankee Fork
- Valley Creek
- Salmon River Upper Mainstem (above Redfish Lake Creek)
- Panther Creek.

The Yankee Fork, a major tributary of the upper Salmon River, has been substantially altered by past mining activities. It is no longer occupied by its native Chinook salmon stock, but hatchery planting has reestablished a small run of spring/summer Chinook salmon (NMFS 2011).

The original stock of spring/summer Chinook salmon in Panther Creek, another major tributary, was extirpated sometime in the late 1950s, due primarily to chemical contamination of surface waters caused by the Blackbird Mine, which operated from the 1940s to the 1960s. In recent years, adult Chinook salmon of unknown origin have begun recolonizing the creek (NMFS 2011b).

The spring/summer Chinook salmon that return to the Upper Salmon River basin are included in the count of spring/summer Chinook salmon passing through the Lower Granite Dam (the blue line in the Figure 3.10-6). Spawning surveys indicate that the number of adult spring/summer Chinook salmon that returned to the Upper Salmon River basin between 2002 and 2012 ranged from 753 to 3,474 fish per year, with an average return of 1,897 individuals. Returns to the Yankee Fork during this time period ranged from 0 to 688 adult spawners, for a 10-year average of 135 individuals (NWFSC 2015).

Spring/summer Chinook salmon returning to the Salmon River basin pass through at least eight distinct fisheries as they move through the Columbia River basin. These fisheries are shown on Figure 3.10-2.

- Lower Columbia River (Zones 1–5) Non-Tribal Commercial
- Lower Columbia River (Zones 1–5) Non-Tribal Sport
- Lower Columbia River (Zones 1–5) Tribal Ceremonial and Subsistence
- Columbia River (Zone 6) Non-Tribal Sport
- Columbia River (Zone 6) Tribal Commercial, Ceremonial and Subsistence
- Lower Snake River Non-Tribal Sport
- Salmon River Basin Non-Tribal Sport
- Salmon River Basin Tribal Ceremonial and Subsistence

Table 3.10-10 summarizes available data on Columbia River basin spring/summer Chinook salmon harvests in each of the fisheries listed above. Data are not available to quantify the number of spring/summer Chinook salmon originating in the Upper Salmon River basin that are harvested in each of these fisheries. As they migrate from the ocean to their natal streams in the Upper Salmon River watershed, however, they would be available for harvest in each of these fisheries along with spring/summer Chinook salmon runs from other locations.

Tribal and sport fisheries occur each year in the Salmon River basin. Current harvest opportunities for Shoshone-Bannock Tribal members provide an estimated half-a-pound of salmon per person, compared to historical use of at least 583 pounds per person (Meyer 1997). The Tribes' Tribal Resource Management Plan harvest framework establishes harvest guidelines for each watershed in the Salmon River basin based on the size of the returning runs. Tribal harvest in the Salmon River basin has averaged roughly 789 fish per year between 2008 and 2014, with a low of 300 and a high of 1,015 fish harvested. In the Yankee Fork, Tribal members harvested a total of 266 spring and summer Chinook salmon between 2008 and 2014. For the past seven years, Panther Creek has had a harvest limit of 3 Chinook salmon per season (the lowest possible harvest amount allocated to a watershed, based on Tribal harvest guidelines). While it has never been closed to fishing, Tribal creel surveys have not recorded a catch in Panther Creek since 2001 (Stone pers. comm. 2015g).

Total recreational harvest in the basin removes over 7,800 fish per year, with approximately 20 angler hours spent per fish. An average of nearly 1,300 spring/summer Chinook salmon were harvested by sport anglers in the upper portion of the basin between 2008 and 2014, accounting for about 16% of the total recreational harvest. State-managed recreational fisheries on spring/summer Chinook salmon primarily target hatchery-origin fish returning to the Sawtooth and Pahsimeroi Hatcheries, and do not currently occur within the North Fork, Panther Creek, Lemhi, East Fork, Yankee Fork, and Valley Creek population areas. Both Yankee Fork and Panther Creek attract large numbers of trout and steelhead fishers in other parts of the year (Schoby pers. comm.).

Salmon populations generate economic value in several ways. Some of the value arises through direct harvest or use of the fish (all dollar values in 2015 dollars).

- Spring/summer Chinook salmon that are harvested commercially (i.e., in the lower Columbia's non-Tribal commercial zones and the Tribal commercial fishery in Zone 6) have value in terms of the prices they generate in the economic market. This value is quantifiable in monetary terms, using market-based valuation techniques. During the 2014 season, for example, ex-vessel prices[2] for Chinook salmon harvested on the Columbia mainstem averaged $6.99 per pound for spring Chinook salmon and $3.52 for summer Chinook salmon, for a per-fish price of $88.38 and $56.32, respectively (Joint Columbia River Management Staff 2015).
- Spring/summer Chinook salmon harvested in recreational fisheries have value in terms of the money anglers pay to go fishing (e.g., gas, fishing equipment, lodging, and food). This value is often quantifiable in monetary terms, using market- and non-market-based valuation techniques. For example, a 2005 study examining the economic impact of salmon and steelhead fishing in Idaho collected data on median angler expenditures in 19 different Idaho regions, and reported that spring/summer Chinook salmon fishers spend roughly $392 per trip (Reading 2005).

[2] The post-season adjusted price per pound for the first purchase of commercial harvest.

**Table 3.10-10. Annual Harvests of Spring/Summer Chinook salmon, by Fishery, 2008-2014**

| Fishery | | Metric | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | Average |
|---|---|---|---|---|---|---|---|---|---|---|
| Lower Columbia (Zones 1-5)[a] | Commercial | # S/S Chinook Harvested | 7,277 | 6,696 | 12,178 | 8,414 | 5,961 | 3,365 | 6,107 | 7,143 |
| | Sport | | 21,752 | 17,587 | 26,273 | 15,082 | 13,703 | 7,401 | 15,957 | 16,822 |
| | Tribal | | 830 | 2,018 | 5,369 | 2,291 | 1,399 | 3,057 | 229 | 2,170 |
| Upper Columbia (Zone 6)[a] | Sport | # S/S Chinook Harvested | 3,287 | 273 | 447 | 208 | 81 | 10 | 465 | 682 |
| | Tribal | | 29,590 | 22,733 | 53,384 | 33,880 | 24,124 | 19,622 | 43,863 | 32,457 |
| Snake River | Sport (WA)[a] | # S/S Chinook Harvested | 515 | 498 | 1,663 | 1,913 | 2,338 | 353 | 1,454 | 1,248 |
| | Sport (ID)[b] | # S/S Chinook Harvested | 340 | 1,631 | 901 | 13,038 | 209 | 276 | 443 | 2,405 |
| | | Number of Angler Hours | 9,618 | 10,270 | 11,970 | 241,772 | 8,084 | 5,986 | 11,096 | 42,685 |
| | | Hours Per Fish Kept | 28 | 6 | 13 | 19 | 39 | 22 | 25 | 22 |
| Salmon River | Sport[a] | # S/S Chinook Harvested | 7,278 | 8,374 | 13,677 | 8,259 | 7,303 | 2,317 | 7,631 | 7,834 |
| | | Number of Angler Hours | 109,191 | 147,872 | 206,514 | 133,885 | 173,431 | 60,444 | 179,600 | 144,420 |
| | | Hours Per Fish Kept | 15 | 18 | 15 | 16 | 24 | 26 | 24 | 20 |
| | Tribal[c] | # S/S Chinook Harvested | 750 | 810 | 1,000 | 700 | 950 | 300 | 1,015 | 789 |
| Upper Salmon River | Sport[d] | # S/S Chinook Harvested | 667 | 3,521 | 1,885 | 1,181 | 801 | – | 719 | 1,253 |
| Yankee Fork | Tribal[c,e] | # S/S Chinook Harvested | 1 | 1 | 1 | – | 242 | 7 | 14 | 38 |

Sources:
- [a] Joint Columbia River Management Staff 2015.
- [b] IDFG 2015f.
- [c] Tardy 2014.
- [d] Schoby pers. comm.
- [e] Denny et al. 2014; Tardy 2014.

Notes:
Shaded rows refer to fisheries most closely related to Alternatives 1 and 2. In Zones 1–6 “Tribal” includes harvest by all Tribes. In the Salmon River and Yankee Fork, numbers only include harvests reported by the Shoshone-Bannock Tribes. All numbers may include jacks; data sources do not always distinguish between returning adults and jacks.
S/S = spring/summer; WA = Washington; ID = Idaho

- Spring/summer Chinook salmon harvested in recreational fisheries also have value in terms of the enjoyment anglers receive from the experience. Many anglers value this experience above what they actually pay to go fishing. This additional value (which economists refer to as consumer surplus or net economic value) is often quantifiable in monetary terms, using non-market-based valuation techniques. A 2011 review of studies published on the net economic value associated with salmon fishing found that the value of a day of recreational salmon fishing ranged from $39.12 to $107.18 per angler day, with an average of $68.23 (Thomson and Speir 2011).
- Spring/summer Chinook salmon harvested in subsistence fisheries have value because they provide sustenance to and reinforce cultural and spiritual identity and relationships among the individuals in the Tribal community. A portion of the subsistence value is quantifiable in monetary terms insofar as any catch offsets salmon or other protein sources that would have to be purchased. Subsistence fisheries have value that transcends the value of replacement protein in that the practice of salmon fishing allows Tribal members to exercise treaty rights and cultural practices, which has widespread but largely unquantifiable benefits to Tribal individuals and communities.

In addition to these harvest-related values, some people value salmon even if they never fish or eat fish. This value reflects these people's willingness to pay to ensure the long-term survival of the species for ecological reasons or for the enjoyment of current and future generations (a value economists recognize as bequest value, or the willingness people have to pay today to ensure their children have the opportunity to experience something in the future) (see, for example, Loomis 2006). The existence of salmon also supports spiritual values that Tribal and some non-Tribal members hold. For many people, this value is not quantifiable in monetary terms, but is important to recognize and describe as part of an assessment of total economic value.

### Yellowstone Cutthroat Trout

Yellowstone cutthroat trout are considered a sensitive species by USFS and a species of concern by the State of Idaho. They are a culturally important species to the Tribes, and Tribal members place great importance on the reservation fishery for both cultural and subsistence fishing. For several decades, the Tribes have dedicated considerable funding and effort to restoring and enhancing trout habitat on the Fort Hall Reservation. These efforts include streamside planting and stabilization, grazing modifications and livestock fencing, enforcement of fishing regulations, and actions to limit the rainbow trout population and increase the stock of genetically pure Yellowstone cutthroat trout on the Fort Hall Reservation.

The Fort Hall Bottoms supports an existing trophy fishery, and is known for the high quality fishing experiences that it provides. Trout species currently present in the area include brown trout, rainbow trout, Yellowstone cutthroat trout, and rainbow/cutthroat hybrids (see, for example, Arellano 2015 and Evancho 2005). The isolated 16-acre oxbow lake located on the Fort Hall Reservation that is the planned restocking location for this program has been separated from the nearby river system and resident trout populations for almost two decades, and does not currently provide fishing opportunity for Yellowstone cutthroat trout (Stone pers. comm. 2015g).

Tribal members are not required to have a permit to fish on the Reservation, and there is no limit placed on the number of fish that can be harvested. Harvest estimates for Tribal members are not recorded. Fishing by non-Tribal members, however, is tightly controlled and largely limited to catch-and-release. In recent years, the Tribes have issued approximately 250 seasonal permits and 400 daily permits to non-Tribal members per year. Seasonal permits cost $200.00 and day permits cost $40.00, with a limit of six non-Tribal fishers allowed per day (Arellano 2015). Using the numbers above, fishing licenses for access to Fort Hall Bottoms generate at least $66,000 dollars a year in revenue for the Tribes.

Beyond Tribal fishing license revenues, Yellowstone cutthroat trout also provide economic benefit in similar ways to spring/summer Chinook salmon, as described previously. This includes the benefit associated with angler spending and enjoyment, as well as the spiritual and cultural values that the fish hold for Tribal members. Given the species' status, it is also likely—based on studies conducted for other threatened and endangered fish species—that some individuals might place value on the species' existence and be willing to pay to preserve and protect the species against continued decline or disappearance. For example, a survey conducted at Yellowstone Lake found that the average park visitor would be willing pay about $11 per year to fund a program to control invasive lake trout, which threaten the lake's population of native Yellowstone cutthroat trout (Cherry et al. 2001).[3]

### 3.10.1.8 Environmental Justice

This section describes the composition of the regional study area in terms of the race and ethnicity and income status of its residents. It then identifies any "environmental justice communities" within Census Block Groups[4] that intersect with a 5-mile radius of the sites.

The 5-mile radius was selected to capture the areas where adverse impacts are most likely to occur, and where a closer evaluation of distributional impacts is necessary (the analysis of impacts is presented in Section 3.10.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, and Section 3.10.2.2, *Alternative 2: Hatchery Program with Temporary Weirs*). The Council on Environmental Quality (CEQ 1997) directs environmental justice analyses to consider communities where:

- Ethnic and racial minorities exceed 50% of the population.
- 20% of the population of a given area is below the federal poverty level at some point over the last 12 months.

Geographic regions in the affected area where the percent of the ethnic and racial minority population is "meaningfully greater" than in the surrounding area should also be identified as part of the analysis. Analyzing data at the census block-group level using the five-year average data from the American Community Survey (2008–2013) is helpful to identify communities meeting these criteria.

Within the 5-mile radius surrounding the Crystal Springs hatchery site there are five census block groups within four census tracts. In the 5-mile radius surrounding the Yankee Fork weir facility, there is just one census tract, which also serves as the block group, due to the sparse population of the area. The same is true at Panther Creek weir facility location. Figure 3.10-7 shows these block groups.

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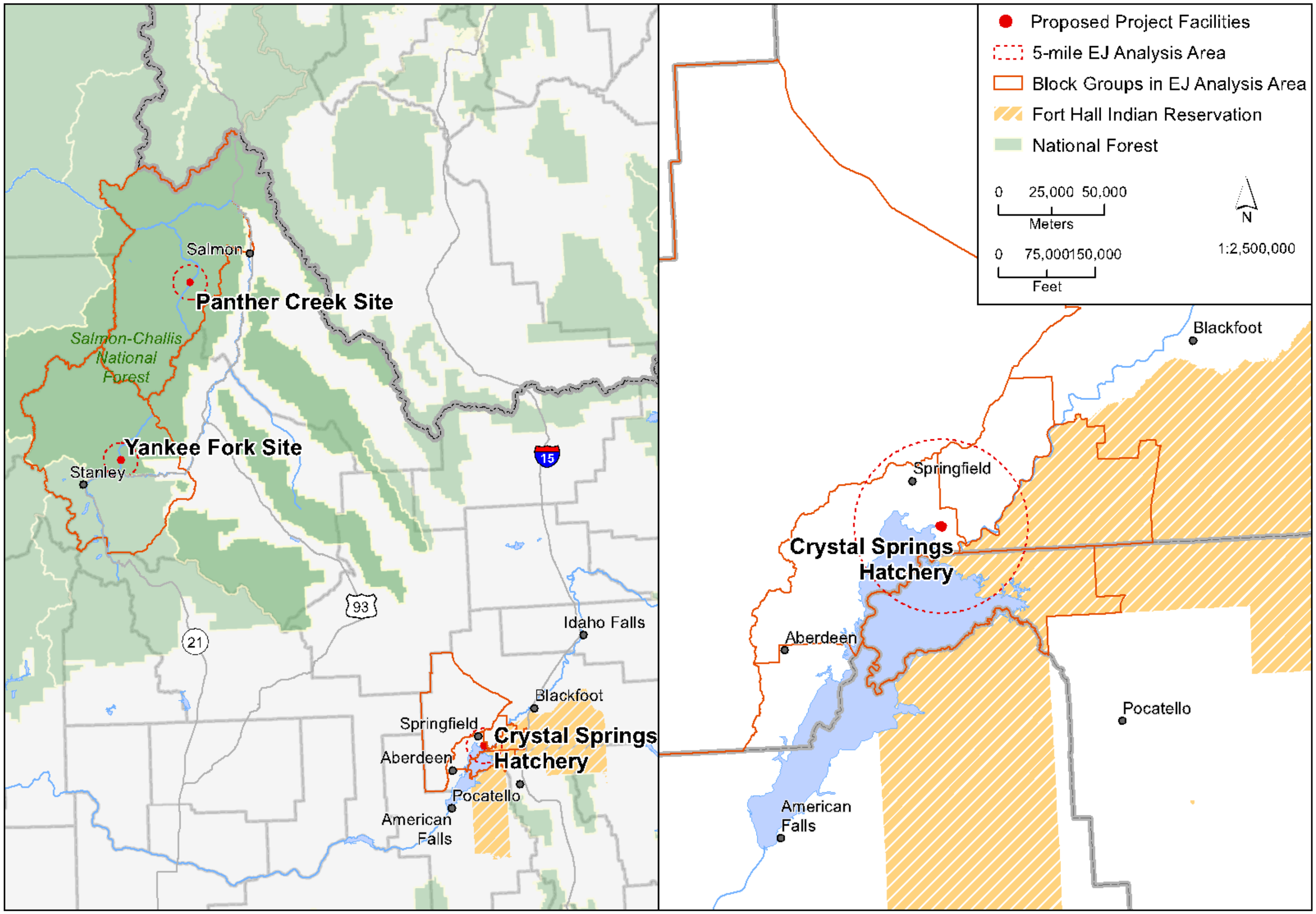
[3] Note that this amount is also reflective of willingness to pay to protect the greater Yellowstone Lake ecosystem, with Yellowstone cutthroat trout as the focal species. It includes willingness to pay to sustain species like bald eagles and grizzly bears that rely heavily on the trout for food.

[4] A Census Block Group is a geographical unit used by the U.S. Census Bureau that divides Census Tracts into smaller units of analysis. It is the smallest geographical unit for which the Census Bureau publishes most data sets.

**Figure 3.10-7. Map of the Environmental Justice Analysis Areas**




Source: Google My Maps geocoding services, 2015; U.S. Census Bureau (2013a) TIGER/Line GIS boundary data, 2010; IDWR GIS boundary data, 2014; U.S. Forest Service GIS boundary data, 2015

As shown in Table 3.10-11, the overwhelming majority of the population in the State of Idaho and analysis area is Caucasian, with approximately 11% of the population identifying as Hispanic or Latino. Within the affected area, two block groups have minority populations that make up more than 50% of the total population: Block Group 1 in Bannock County includes 61% of residents who identify as American Indian or Alaska Native; and 81% of residents in Block Group 2 of Bingham County identify as American Indian or Alaska Native. These block groups reflect the populations of the Fort Hall Indian Reservation.

**Table 3.10-11. Race and Ethnicity, 2008–2013**

| Geography | White | American Indian and Alaska Native | Black | Other | Hispanic/ Latino |
|---|---|---|---|---|---|
| Idaho | 92% | 1% | < 1% | 6% | 11% |
| Regional Study Area | | | | | |
| Bannock County | 91% | 4% | < 1% | 4% | 7% |
| *Census Tract 9400, Block Group 1* | *35%* | *61%* | *0%* | *4%* | *7%* |
| Bingham County | 87% | 5% | < 1% | 5% | 17% |
| *Census Tract 9400, Block Group 2* | *16%* | *81%* | *0%* | *< 1%* | *7%* |
| Census Tract 9503, Block Group 2 | 93% | 0% | 0% | 7% | 8% |
| Census Tract 9503, Block Group 3 | 99% | 0% | 0% | < 1% | 19% |
| Census Tract 9507, Block Group 3 | 96% | 0% | 0% | 4% | 15% |
| Custer County | 98% | < 1% | 0% | 1% | 2% |
| Census Tract 9602, Block Group 1 | 98% | 0% | 0% | 2% | 4% |
| Lemhi County | 97% | 1% | 0% | 1% | 3% |
| Census Tract 9701, Block Group 1 | 93% | 1% | 0% | 6% | 3% |

Source: U.S. Census Bureau 2014c, U.S. Census Bureau 2014d, U.S. Census Bureau 2014e
Note: Race categories include those who identify as Hispanic or Latino.

The U.S. Census Bureau (2014) estimates that approximately 18% of residents in the regional study area live below the poverty line. In aggregate, this is slightly higher than the statewide average of 16% over the same period. When looking at the block groups within the environmental justice analysis area, the data reveal that five of the seven block groups have populations with poverty levels equal to or greater than the averages for the state of Idaho or the regional study area, shaded in gray in Table 3.10-12.

The shaded rows in Table 3.10-11 and Table 3.10-12 identify several environmental justice populations that may be disproportionately affected by the alternatives. The population for Census Block 9400 in Bingham County is generally concentrated within the boundaries of the Fort Hall Indian Reservation. The other highlighted block groups in Bingham County have a high proportion of residents who self-identify as Hispanic or Latino, who may be farm workers with limited incomes. The high rates of poverty in Custer and Lemhi Counties likely arise from limited economic opportunities in rural areas.

**Table 3.10-12. Population below the Poverty Level, 2008–2012**

| Geography | Percent of Individuals Below the Poverty Line |
|---|---|
| Idaho | 16% |
| Regional study area | 18% |
| Bannock County | 15% |
| Census Tract 9400, Block Group 1 | 7% |
| Bingham County | 15% |
| *Census Tract 9400, Block Group 2* | *37%* |
| Census Tract 9503, Block Group 2 | 17% |
| *Census Tract 9503, Block Group 3* | *22%* |
| *Census Tract 9507, Block Group 3* | *25%* |
| Custer County | 16% |
| *Census Tract 9602, Block Group 1* | *52%* |
| Lemhi County | 23% |
| *Census Tract 9701, Block Group 1* | *55%* |

Source: U.S. Census Bureau 2014c, U.S. Census Bureau 2014d, U.S. Census Bureau 2014e

## 3.10.2 Environmental Consequences

For the purposes of this analysis, the Hatchery Program would have direct and indirect impacts if it generated any of these effects, which could be positive or negative:

- Directly or indirectly cause a change in human population.
- Directly or indirectly cause a change in income or expenses for private firms or individuals.
- Directly or indirectly cause a change in employment opportunities.
- Directly or indirectly cause a change in demand for temporary or permanent housing.
- Directly or indirectly cause a change in demand or supply of public services, including fire protection, law enforcement, water supply, wastewater treatment, education, and roads.
- Directly or indirectly cause a change in revenue or expenditures for public agencies.
- Directly or indirectly cause a change in the benefits or costs associated with the ownership and use of private land.
- Directly or indirectly cause a change in the economic value individuals and/or society derives from the ecosystem, including salmon populations.
- Directly or indirectly cause changes or distribute them in a manner that affects social structures, values, and lifestyles of individuals or communities.
- Directly or indirectly cause impacts that disproportionately affect minority and/or low-income populations.

### 3.10.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Population

Alternative 1 would generate a short-term increase in the population of the regional study area during construction, as workers from out of the region temporarily relocate to work on the sites (see the *Employment* section below for a more detailed discussion). However, only specialized construction activities would require workers from outside the region. At most, 10 workers would temporarily relocate to the regional study area at any one time. This temporary increase would be indistinguishable from current conditions at the regional level, and would be a small change in the population closest to the Crystal Springs hatchery site (about 0.003% of the regional study area population; 0.02% of the population of Bingham County, and 9% of the population of the nearest community, Springfield). This change during construction would not lead to a discernible increase in the population of the regional study area, a **low** impact.

Operation of the Hatchery Program would involve six full-time employees and seven seasonal hires. Even if all employees were drawn from outside the regional study area—an unlikely outcome given the Tribal Employment Rights Ordinance that encourages employment from the Fort Hall Reservation—the resulting population increase would be a tiny fraction of the overall size of the regional population (about 0.003% of the Regional Study Area population; 0.02% of the population of Bingham County, and 11% of the population of the nearest community, Springfield.) Thus, Alternative 1 would have a **low** beneficial impact on the population of the regional study area during operation.

There would be no change in population trends in the study region from either construction- or operation-related employment.

#### Employment

Construction of the Crystal Springs hatchery would require approximately 20 workers for one construction season between 2016 and 2018. Construction of the Yankee Fork and Panther Creek weir facilities would require approximately 10 workers each for the same construction season. These weir facilities would likely be constructed concurrently, so approximately 20 workers total would be needed. These may or may not be the same 20 workers employed for construction at the hatchery facility. Approximately 50%, or 10 workers, would require specialized skills and may come from outside the regional study area. The employment required to construct Alternative 1 would represent a very small proportion of the current workforce in the regional study area (about 0.015%, based on a workforce of about 136,145 in 2013). Therefore, the temporary impact on the labor market, including trends in unemployment rates and employment sectors within the regional study area, would be **low**.

During operation, Alternative 1 would employ six people full-time per year and seven people seasonally each year. This increase in employment would have a **low** effect on the labor market in the regional study area in the long run, including trends in unemployment rates and employment sectors within the regional study area.

During construction of the Crystal Springs hatchery, contractors would be required to follow the provisions of the Tribal Employment Rights Ordinance, which dictates a hiring preference for Tribal applicants and subcontractors. During the operations phase of the Hatchery Program, assuming qualified individuals are available, Tribal members would be given preference in the hiring process, a **low** beneficial impact on Tribal employment (Stone pers. comm. 2015g). Due to the source of funding for both construction and operations, these jobs would accrue to the government sector of the local economy.

## Income

Construction of the Crystal Springs hatchery is expected to cost approximately $12 million in 2015 dollars. Construction of the Yankee Fork and Panther Creek weir facilities is expected to cost $2.8 and $2.7 million, respectively, in 2015 dollars. The total construction cost of Alternative 1 would be approximately $18 million[5] in 2015 dollars (Shoshone-Bannock Tribes 2013). These construction costs include expenditures on labor, materials, and equipment.[6]

A portion of these costs would be spent on wages and benefits for workers from the regional study area, and on materials purchased or equipment rented from businesses located in the regional study area. These local expenditures would have secondary effects on the economy, as workers and businesses receiving income would re-spend some of the money locally; the employees of businesses who receive that money would also re-spend some locally. These direct expenditures would represent a very small proportion of the total annual income in the regional study area (about 0.16% of total personal income in the regional study area, which was about $10.9 billion in 2013). They may or may not represent a net increase in expenditures in the region, depending on how the funds would have been spent without Alternative 1.

Annual operation costs would be approximately $750,000 per year, escalating at 2% per year.[7] Payroll, including wages and benefits, represents about 56% of the annual operating costs. Annual monitoring and evaluation costs would be approximately $800,000 per year, escalating at 2% per year.[8] Payroll represents about 60% of annual monitoring and evaluation costs within the regional study area (Shoshone-Bannock Tribes 2013). These expenditures would represent a very small proportion of the total annual income in the regional study area (about 0.01% of total personal income in the regional study area, which was about $10.9 billion in 2013). They may or may not represent a net increase in expenditures in the region, depending on how the funds would have been spent without Alternative 1.

Overall, impacts on income in the region would be **low**.

## Government Revenue

Alternative 1 may generate small amounts of tax revenue for the State of Idaho through personal and corporate income taxes paid by the employees and contractors on income earned during construction activities. Data are insufficient to quantify the value of the increased income tax payment, but even if the total cost of the Hatchery Program were taxed as income, the revenue would be insignificant compared to annual income tax collections (the maximum personal and corporate income tax rate is 7.4%, which would yield taxes equivalent to about 0.08% of the total personal income tax collections and 0.01% of total corporate income tax collections in FY2014).

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[5] Costs of Hatchery Program components may not sum exactly due to rounding.

[6] The total does not include certain construction expenses (e.g., construction management, engineering support, bonding), Tribal Employment Rights Ordinance fees, or land purchases, leases, and easements.

[7] Includes operation and maintenance costs for both the Chinook salmon and Yellowstone cutthroat trout programs.

[8] Includes monitoring and evaluation costs for both the Chinook salmon and Yellowstone cutthroat trout programs.

Alternative 1 may also generate small amounts of revenue for the State of Idaho through the sales/use tax. Again, data are insufficient to quantify the value of the increased sales/use tax payment, but even if the total cost of the Hatchery Program were assessed a sales/use tax, the revenue would be insignificant compared to the annual sales/use tax collections (the sales/use tax rate is 6%, which equates to a tax payment approximately 0.08% of total sales/use tax collections in FY2014).

Any non-local workers who stay in the area's hotels and motels during construction may generate a small amount of lodging tax revenue for the communities where they stay. The number of non-local workers is anticipated to be relatively small, and their stay in the area during construction is not likely to extend over a long period of time. Depending on where non-local workers stay and for how long, the impact arising from lodging tax payments would range from indiscernible (for example, in the Pocatello market), or small but measurable (for example, in the smaller Stanley market for long-term stays in hotel/motels).

The land where the proposed Crystal Springs hatchery would be built is currently owned by the Bonneville Power Administration, which is exempt from paying property taxes. USFS administers the public land associated with the Yankee Fork and Panther Creek weir facilities, and also is exempt from paying property taxes. These exemptions would remain in place under Alternative 1; therefore, Alternative 1 is not expected to impact property tax collections in Bingham, Custer, or Lemhi Counties.

The relatively small increase in tax revenue during construction of the project would result in a short-term, **low** impact.

## Housing

Construction of Alternative 1 is not expected to lead to an increase in permanent population, but it likely would draw up to 10 non-local workers to the area temporarily to provide specialized services that local contractors would not have the expertise or capacity to provide. These non-local workers would need temporary housing accommodations. If any contractor would be required to remain in the area for several months, they may seek rental housing. Those whose jobs would last a few days to weeks would likely stay in hotels and motels in the area.

It is also possible that some non-local workers may stay in RV Parks or campgrounds close to the construction site, especially for construction activities at Yankee Fork and Panther Creek. Workers from within the regional study area may also choose to stay at the construction sites at Yankee Fork and Panther Creek due to their remote location relative to the population centers in the regional study area.

Rental housing and hotel/motel availability in the communities within commuting distance of all three sites is sufficient to absorb the temporary increase in demand during the construction period. If workers occupy campgrounds near Yankee Fork, their presence may cause some displacement to customary recreation users near Pole Flat Campground, especially during the fishing and recreation season (April through September) when campgrounds operate near or at capacity (Callaghan pers. comm.; Libertine pers. comm.).

Alternative 1 includes construction of three housing units at the Crystal Springs hatchery site. At the Yankee Fork site, two RV areas would be graded to accommodate employees during the trapping season. For this reason, no increased demand for existing temporary or permanent housing is expected during operation of the Hatchery Program.

Because the available rental housing, hotels, and campsites are sufficient to accommodate temporary construction workers or to absorb displaced campers, Alternative 1 would have **no** impact on vacancy and housing.

## Public Services and Infrastructure

Alternative 1 is not expected to lead to population changes in the long-term, so it would have **no** impact on public services related to permanent housing, schools, and other similar public services. Alternative 1 would not require additional connections to public water or sewer infrastructure, as the site would have a dedicated septic tank and drain field. No impacts on the water or sewer utilities are expected from Alternative 1.

Construction activities may temporarily increase the risk of a major accident or incident requiring emergency services. The medical facilities, law enforcement, and fire departments in the regional study area all have labor and equipment capacity to handle risks associated with Alternative 1. Emergency services in the regional study area have coordinated response agreements to respond to incidents near the sites if a particular department were temporarily unavailable. Long response times to the remote Panther Creek site may increase the risk of consequences of injury or damage to property if an emergency occurred at that location.

Alternative 1 would generate solid waste during construction and operation. The Rattlesnake Transfer Site would accept construction waste from the Crystal Springs hatchery site, which would eventually be transferred to the Aberdeen Non-Municipal Landfill. Construction waste generated at the Panther Creek site would be deposited at the Lemhi County Landfill, and construction waste generated at the Yankee Fork site would be accepted and deposited at the Custer County Landfill. These facilities would also accept solid waste generated during operation. The county waste management sites have sufficient capacity to absorb any waste generated from Alternative 1. No impact on solid waste facilities is expected.

Idaho Power has agreed to relocate and reconnect a powerline running to the Crystal Springs hatchery site during construction. This relocation and reconnection would have **no** impact on and would not disrupt power to nearby property owners.

## Use and Value of Fish

### Spring/Summer Chinook Salmon

Alternative 1 would release 600,000 to 800,000 smolts each year; 400,000 produced for release into Panther Creek, and 600,000 produced for release into the Yankee Fork. Run-size and harvest estimates reported in the Hatchery Master Plan (Shoshone-Bannock Tribes 2013) are shown in Table 3.10-13.

**Table 3.10-13. Number of Adult Spring/Summer Chinook Salmon Produced in Yankee Fork and Panther Creek With and Without the Proposed Crystal Springs Hatchery Program**

| | Number of Spring/Summer Chinook Salmon Adults per Year Without Hatchery Program | | | Number of Spring/Summer Chinook Salmon Adults per Year With Hatchery Program | | |
|---|---|---|---|---|---|---|
| Area/Metric | Minimum | Maximum | Average | Minimum | Maximum | Average |
| Yankee Fork | | | | | | |
| Total run size | – | 142 | 21 | 1,303 | 7,012 | 2,284 |
| Total harvest | 2 | 61 | 11 | 644 | 3,819 | 1,224 |
| Panther Creek | | | | | | |
| Total run-size | 1 | 55 | 11 | 1,009 | 5,961 | 1,877 |
| Total harvest | 1 | 26 | 6 | 534 | 3,257 | 1,023 |

Sources: Shoshone-Bannock Tribes 2013.

Notes: Estimates for Yankee Fork used a "smolt to adult return" ratio of 0.29% based on recorded rates at the Sawtooth Hatchery, while estimates for Panther Creek used a "smolt to adult return" ratio of 0.32% based on rates recorded for the McCall Hatchery.

The numbers presented in Table 3.10-13 suggest that Alternative 1 would increase the Columbia River basin's adult salmon population by about 2,311 to 12,776 fish per year,[9] making additional fish available for harvest within the eight distinct fisheries described Section 3.10.1.7, *Use and Value of Fish*. Assuming the Columbia River basin supports a stable baseline salmon population of 2 million fish, the Hatchery Program would increase fish populations by about 0.12–0.64%. Alternative 1 would result in roughly 1,800 additional spring/summer Chinook salmon available per year for terminal harvest by Shoshone-Bannock Tribal members. These estimates explicitly take into account all mortality and harvest that occurs downriver (i.e., the harvests that occur in the Pacific Ocean, as well as inland fisheries on the Columbia River and Snake River). It also assumes all baseline trends in escapement and population status (i.e., mortality resulting from dam passage, human disturbance of habitat, or other impacts) remain constant.

These spring/summer Chinook salmon would increase the supply of fish in all existing spring/summer Chinook salmon fisheries in the Columbia River basin, and would support new and expanded recreational and Tribal fisheries in the Upper Salmon River basin. The socioeconomic impacts of Alternative 1 would, over time, result in increased economic value derived from commercial, Tribal commercial and subsistence, and recreational use of the fish. This includes the market and non-market value of the fish themselves, as well as increases in income for businesses that benefit from increased fishing activity. For example, if recreational angling activity increases in the Upper Salmon River basin following increased catch rates for spring/summer Chinook salmon, it may result in new economic opportunities for local guides and outdoor supply and outfitting shops. Increased visitation by anglers from outside the region may also result in more income for local businesses that provide services to tourists. Increased Tribal allotments of the harvest would increase the amount of fish available for each Tribal member for subsistence and ceremonial purposes. Increased number of fish available for harvest would also expand opportunities for maintaining cultural and ceremonial practices among Tribal members.

[9] The increase in adult salmon population is calculated by adding the total run size of spring/summer Chinook salmon adults produced in Yankee Fork and Panther Creek with the proposed Hatchery Program less the total run size of adults produced in Yankee Fork and Panther Creek without the Hatchery Program.

Tribal members currently focus their harvest of Spring/Summer Chinook in basins where hatchery programs operate to increase abundance of stocks to harvestable levels. The Hatchery Program would provide two additional watersheds for Tribal members to engage in subsistence fishing activities. Engaging in subsistence fishing provides Tribal families with high quality foods throughout the year and alleviates some of the financial burden of purchasing foods from local grocery stores. As the program develops in the foreseeable future, the Yankee Fork and Panther Creek fisheries can be used to collect fish for communal distribution in Fort Hall to elders or members who cannot afford to travel for fishing activities during the summer.

Many of these economic impacts are difficult to quantify given the data available today. The following sections provide two perspectives on the potential socioeconomic impact of increasing fish populations: *Total Economic Value of Spring/Summer Chinook Salmon* recognizes that the fish have value that can be measured in monetary terms, and *Cultural and Spiritual Value of Spring/Summer Chinook Salmon* recognizes that fish also support values that are not measurable in dollars.

***Total Economic Value of Spring/Summer-Run Chinook Salmon***

Data are not available to estimate specific changes in commercial fish prices, per-trip values for recreational anglers, or other changes in market or non-market values of fish resulting from Alternative 1. Instead, this analysis relies on a study undertaken in the Columbia River basin to provide a perspective on the potential economic value of Alternative 1.

In 1999, the Washington Department of Ecology commissioned the development and application of a model (LBP Study) for estimating the total economic value of benefits derived from potential future programs aimed at improving Pacific migratory salmon populations in the Columbia River basin (Layton, Brown, and Plummer 1999). The LBP Study surveyed Washington residents and used the results to develop a model for estimating the total economic value associated with potential future increases in five different fish populations in Washington. This analysis employs the findings for what the LBP Study calls Eastern Washington and Columbia River migratory fish (i.e., salmon and steelhead originating from Eastern Washington and the Columbia River basin).

The LBP Study model requires an input that reflects the change in fish populations; for Alternative 1, this would be the percentage increase in fish populations over the next 20 years. The model's results show annual household willingness to pay for that increase in salmon populations over the course of the 20-year period.

Values were updated to 2015 dollars using the consumer price index, and adjustments were made to account for changes in household income levels in the decade since the study was conducted. To capture some of the potential differences across regions, differences in the median household incomes in each state were also considered. Results are shown in Table 3.10-14.

**Table 3.10-14. Summary of Willingness to Pay Estimates for Increased Salmon Populations Associated with the Crystal Springs Hatchery Program (2015 dollars)**

| Estimate | Washington | Oregon | Idaho |
|---|---|---|---|
| Household willingness to pay per year | \$2.06–\$11.58 | \$1.78–\$9.96 | \$1.65–\$9.28 |
| Number of households | 2.63 million | 1.52 million | 580,000 |
| Total willingness to pay per year | \$5 million–\$30 million | \$3 million–\$15 million | \$1 million–\$5 million |
| 20-year present value | \$78 million–\$440 million | \$39 million–\$218 million | \$14 million–\$78 million |

Source: ECONorthwest, with data from Layton, Brown, and Plummer 1999 and Shoshone-Bannock Tribes 2013

The study's results suggest that the average household would be willing to pay about \$1.65 to \$11.58 per year (with variation across states), for 20 years, for the Hatchery Program's potential impact on Columbia River migratory fish populations. This sums to a total of \$9 million to \$50 million a year across the three regions. The total economic value of the Hatchery Program's impact on the salmon population over the next 20 years, discounted at 3% per year,[10] would be \$131 to \$736 million.

Another estimate of the value of spring/summer Chinook salmon in the Salmon River basin was developed in the 1990s, as a result of a Natural Resource Damage Assessment process that estimated the monetary value associated with the loss of Chinook salmon from Panther Creek due to pollution from the Blackbird Mine. Without mining damages, it is estimated that there would have been a population of approximately 200 adult spring/summer Chinook salmon spawning in Panther Creek each year (Ando and Khanna 2004). The cost of initial compensatory actions to restore this salmon run was estimated at \$9 million, and the case ultimately settled for a total amount of \$60 million (Chapman et. al. 1998; NMFS 1995). The value of adult Chinook salmon used in the analysis was \$292.13 to \$618.39 (in 2015 dollars), per adult fish, based on a mix of commercial and recreational fish values (Reiser 1986).

***Cultural and Spiritual Value of Spring/Summer-Run Chinook Salmon***

Although total economic value, in theory, captures a broad range of types of value held by a population, there are some types of value or importance that remain beyond quantification in monetary terms. One example is the benefit Tribal members receive when the community is able to harvest fish from traditional fishing areas. The Tribes harvest wildlife and botanical resources as well as resident and anadromous fish under rights reserved by the Fort Bridger Treaty of 1868 (Shoshone-Bannock Tribes 2015a). Tribal fishing methods pursued in the Upper Salmon River basin include the culturally important techniques of in-stream spearfishing, netting, and snagging.

The Fort Bridger Treaty expressly allows Shoshone-Bannock Tribal members to carry on their cultural traditions, which are intertwined with and depend on the restoration and continuation of salmon populations. The salmon harvest reinforces the way of life and the cultural and spiritual underpinnings and continuity of the Shoshone-Bannock Tribal community (Stone pers. comm. 2015g). Because the existence of salmon and the ceremonial and subsistence uses of these fish are intertwined with the cultural, nutritional, and spiritual well-being of Tribal people, their value is

[10] Discounting is a mathematical adjustment that allows a stream of payments or values that accumulate over time to be summed in a single value in current-year dollars.

incalculable. Alternative 1 would result in a **low** impact on the Tribes' ability to preserve and carry on these traditions.

#### Yellowstone Cutthroat Trout

The addition of a new fishing location and native trout population would increase opportunities for recreational fishing by both Shoshone-Bannock Tribal members and non-Tribal members, and harvest opportunities for Tribal members. It would also further state and federal goals to protect and strengthen the regional population of Yellowstone cutthroat trout, and reinforce the economic value people place on restoring these sensitive species, as described in Section 3.10.1.7, *Use and Value of Fish*.

Under Alternative 1, 5,000 Yellowstone cutthroat trout would be produced for release in an isolated 16-acre oxbow lake located on the Fort Hall Reservation. The release would have a catch goal of 0.5 fish per hour of fishing effort in the oxbow lake. Oxbow lake does not currently contain any trout. Given the size of oxbow lake, the catch rate is expected to be potentially lower, but would be comparable to other fisheries in the same vicinity. For example, in 2006, anglers caught approximately 0.80 trout per hour (and about 0.20 per hour for trout over 18 inches) in streams within the Fort Hall Bottoms (Shoshone-Bannock Tribes 2010b). Production under Alternative 1 would increase the regional stock of native Yellowstone cutthroat trout, which are considered a species of concern by the State of Idaho. Further, this production would continue to support the existing Fort Hall Bottoms trophy fishery.

Yellowstone cutthroat are culturally important to the Tribes, and Tribal members place great importance on the reservation fishery for both religious and subsistence fishing. For several decades the Tribes have dedicated considerable funding and effort to restoring and enhancing trout habitat on the Fort Hall Reservation, which would be supported by Alternative 1 and would result in a **low** impact for the Tribes.

### Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations (collectively, environmental justice populations), states that each federal agency should 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 Executive Order further stipulates that agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

For the purpose of Executive Order 12898, minority populations include all people of the following origins: African-American, American Indian and Alaska Native, Native Hawaiian or Other Pacific Islander, and Hispanic (of any race). Low-income populations are populations that are at or below the poverty line, as established by the U.S. Department of Health and Human Services.

The impact analysis did not identify any adverse socioeconomic impacts that would arise from Alternative 1. Thus, there are **no** adverse impacts that would have a disproportionate effect on the environmental justice populations identified in the analysis area.

By increasing fish populations and opportunities for commercial, recreational, and subsistence harvest and cultural and traditional use fisheries, Alternative 1 would have a **low** impact on minority and low-income populations associated with the Tribes and the Fort Hall Indian Reservation.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

The Crystal Springs hatchery proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, beneficial and adverse construction-related impacts on population, employment, income, government revenue, housing, public services and infrastructure, and environmental justice are expected to be the same as described for the Crystal Springs hatchery site in Section 3.10.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*. These impacts would be **low**.

Although production of Yellowstone cutthroat trout would not change under the 50% production option, because production of Chinook salmon would be reduced by 50%, the hatchery would require one less full-time aquaculture specialist and fewer temporary technicians to operate (D.J. Warren and Associates, Inc. 2016). Therefore, operational impacts of the reduced production option related to income and employment would be less, as fewer people would be employed at the hatchery facility to manage a reduced production of Chinook salmon. For this reason, adverse and beneficial impacts during operation related to population, employment, income, government revenue, housing, public services, and infrastructure are expected to be less than under full production for the Crystal Springs hatchery.

Assuming the production of Chinook salmon is reduced by 50% under the reduced production option, the impact on the use and value of fish would also be reduced by 50%. Instead of producing 600,000 to 800,000 smolts of Chinook salmon each year, the hatchery would produce 300,000 to 400,000 smolts. At this level of production, the reduced production option would increase the Columbia River basin's adult Chinook salmon population by approximately 1,000 to 6,000 fish per year compared to approximately 2,000 to 12,000 fish per year under full production, making fewer fish available for harvest within the eight distinct fisheries described in Section 3.10.1.7, *Use and Value of Fish*. This would result in an increase in the value of these fisheries, and enhancements to the cultural and spiritual values Tribal members and others experience as Chinook salmon populations increase in the Columbia River basin. However, the increase in value would be proportionately less than described for full production under Alternative 1 and would result in a **low** impact.

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, beneficial and adverse construction-related impacts on population, employment, income, government revenue, housing, public services and infrastructure, and environmental justice are expected to be the same as described for the Yankee Fork and Panther Creek weir facilities in Section 3.10.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*. These impacts would be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Therefore, impacts described for operating the weir facilities under Alternative 1 for full production would also be the same for the reduced production option, and would result in a **low** impact on socioeconomics and environmental justice.

### 3.10.2.2 Alternative 2: Hatchery Program with Temporary Weirs

The impacts associated with the Crystal Springs hatchery for Alternative 2 are the same as those impacts discussed in Section 3.10.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*. These beneficial and adverse impacts would be **low**.

The impacts associated with the Yankee Fork and Panther Creek weir facilities would differ from Alternative 1 in the following ways:

- **Employment**. No additional workers would be needed to seasonally install, operate, or remove the temporary weir systems proposed under Alternative 2. Existing workers would be used, so no temporary change in employment is expected (apart from the 20 workers needed to construct the Crystal Springs hatchery).
- **Income***.* Seasonal installation, operation, and removal of the temporary weir systems proposed under Alternative 2 would involve only a one-time initial purchase of materials. The cost is expected to be approximately $25,000 per weir (Stone pers. comm. 2015g). If these materials were purchased from local businesses, this money would create a very small beneficial impact in the regional study area. The operation of the temporary weirs would involve existing staff, so no new income associated with wages is expected.
- **Government Revenue***.* Installation of the temporary weirs would involve the purchase of materials, which may generate some sales/use tax for local businesses. This increase in sales/use tax would be very small compared to the total sales/use tax collections in the regional study area.
- **Housing.** No construction would occur at the Yankee Fork or Panther Creek sites that would result in demand for temporary accommodations from workers. Two workers would be needed to operate the temporary facilities. Operation would not require an extended stay, so no increase in demand for temporary lodging during operation is anticipated.
- **Public Services and Infrastructure**. Operation of the temporary weirs would involve the temporary presence of a few workers at each site, which would slightly increase the risk of an emergency that would require response from local first responders. Sufficient capacity exists among local law enforcement, fire, and medical organizations to respond to such an emergency. Long response times to the remote Panther Creek site may increase the risk of consequences of injury or damage to property if an emergency were to occur at that location.

These impacts on employment, income, government revenue, housing, and public services and infrastructure would be **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to construction of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. Therefore, beneficial and adverse construction-related impacts on population, employment, income, government revenue, housing, public services and infrastructure, and environmental justice for the reduced production option are expected to be the same as described for full production at the Crystal Springs hatchery site in Section 3.10.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*. These impacts would be **low**.

As described above for 50% production under Alternative 1, operational impacts related to income and employment would be less under the reduced production option, as fewer people would be employed at the hatchery facility to manage a reduced production of Chinook salmon. Additionally, although the Hatchery Program would result in an increase in the value of Chinook salmon fisheries, and enhancements to the cultural and spiritual values Tribal members and others experience as Chinook salmon populations increase in the Columbia River basin, the increase in value would be proportionately less for the reduced production option than described for full production and would result in a **low** beneficial impact.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weir at the Yankee Fork and Panther Creek sites. As a result, there would a **low** impact on socioeconomics and environmental justice.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Therefore, impacts described for operating the weir facilities under Alternative 2 for full production would also be the same for the reduced production option, and would result in a **low** impact on socioeconomics and environmental justice.

## 3.10.3 Mitigation

As discussed in Section 3.10.2, *Environmental Consequences*, the Hatchery Program is expected to result in **low** construction- and operations-related impacts on socioeconomic resources. Therefore, no mitigation measures are recommended for Alternative 1 or Alternative 2.

## 3.10.4 No Action Alternative

The No Action Alternative assumes all baseline conditions described in the affected environment section with respect to population, employment, income, government revenue, housing, public services and infrastructure, the value of fisheries, and environmental justice would persist. The No Action Alternative would not require any expenditures for the construction of new facilities and no costs associated with operation of the facilities and new fish production would be incurred. There would be **no** impact on these areas of analysis.

Current activities related to the Yankee Fork Chinook Salmon Supplementation Program would cease unless the USFS issues a special use permit. No long-term source of spring/summer Chinook salmon would be available for developing a self-sustaining broodstock in the Yankee Fork basin or Panther Creek basin, and no source of Yellowstone cutthroat trout would be available to introduce on the Fort Hall Reservation. Self-sustaining fish populations in Yankee Fork and Panther Creek would not be established in the same timeframe as under Alternatives 1 and 2, and possibly not at all. This would perpetuate current **moderate** adverse impacts on Shoshone-Bannock Tribal members who are not be able to fully exercise their treaty rights to harvest fish in Panther Creek, Yankee Fork, or the Fort Hall Bottoms. In allowing the status quo to continue with respect to Chinook populations in the upper Salmon River, the No Action Alternative also would perpetuate an absence of recreational fishing opportunities and the economic benefits for the Tribes potentially associated with them. The No Action Alternative would have disproportionate impacts on Shoshone-Bannock Tribal members, constituting adverse environmental justice impacts, a **moderate** impact.

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# 3.11 Air Quality and Climate Change

This section describes the affected environment and environmental consequences, including mitigation measures, associated with air quality and climate change resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the hatchery under two Chinook salmon production level options: the proposed production level (production of up to 1 million smolts) and a 50% production level.

## 3.11.1 Affected Environment

The analysis area for the air quality affected environment and environmental consequences includes each site and vicinity and the associated roadways that would be traveled by Hatchery Program-related vehicles: the Crystal Springs hatchery site and River Road, the Yankee Fork site and Yankee Fork Road, and the Panther Creek site and Panther Creek Road. The analysis area for climate change is the global atmosphere.

### Criteria Pollutants

The Environmental Protection Agency (EPA) and the Idaho Department of Environmental Quality (IDEQ) both have responsibility for air quality in the state of Idaho. EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution (40 CFR 50). The NAAQS focus on "criteria pollutants," which are pollutants of particular concern for human health and welfare including carbon monoxide, lead, nitrogen dioxide, particulate matter, ozone, and sulfur dioxide. At concentrations that exceed the NAAQS, these pollutants can be a public health hazard, especially for sensitive groups such as people with respiratory ailments, and they can reduce visibility on highways and in scenic areas to the detriment of public safety or enjoyment. IDEQ is responsible for monitoring and enforcing air quality standards in Idaho.

The air pollutant of greatest concern in the region surrounding the sites is particulate matter. Particulate matter is measured in two size ranges: particles 10 micrometers in diameter and smaller (PM10) and 2.5 micrometers in diameter and smaller (PM2.5). The most common sources of PM10 and PM2.5 in the region are wood smoke (from residential, agricultural, and forest fires), motor vehicles, and windblown dust (IDEQ 2015b).

All three sites are in an area that EPA has designated as attainment, meaning that the concentrations of criteria pollutants in the area are below the NAAQS (EPA 2015a).

### Greenhouse Gases

Greenhouse gases (GHGs) are chemical compounds in the Earth's atmosphere that absorb and trap infrared radiation (heat) that is reflected or emitted from the surface of the earth. The trapping and subsequent buildup of heat in the atmosphere creates a greenhouse-like effect that maintains a global temperature warm enough to sustain life (EIA 2014). GHGs can be produced either by natural processes or as a result of human activities. Human activities result in the emission of three main GHGs that contribute to climate change (EPA 2014a):

- Carbon dioxide ($CO_2$) constitutes 81% of all human-caused GHG emissions in the U.S., primarily due to the combustion of fossil fuels (coal, oil, gasoline, natural gas, and other fuels) and wood products (EPA 2014a). Changes in land use and management can also increase $CO_2$ emissions into the atmosphere through, for example, conversion of forests into croplands, application of synthetic fertilizers, and development of grasslands into residential settlements (WHRC 2015).
- Methane ($CH_4$) is emitted during the production and transport of fossil fuels, through intensive animal farming, and by the decay of organic waste in landfills.
- Nitrous oxide ($N_2O$) is emitted during agricultural and industrial activities, and during the combustion of fossil fuels and solid waste.

The current scientific consensus is that human-made sources are increasing atmospheric GHG concentrations to levels that will raise the Earth's average temperature. Models predict that, by 2100, the average temperature in the United States would increase by about 4 to 11 degrees Fahrenheit depending on the emissions scenarios and climate models used (Meehl et al. 2007).

The United States Global Climate Research Program (USGCRP) found that since the 1970s, average U.S. temperatures and sea levels have risen and precipitation patterns have changed (USGCRP 2014). These conclusions are further supported by the Intergovernmental Panel on Climate Change (IPCC), which found similar patterns on a global climate scale (IPCC 2007). Climate models indicate that atmospheric concentrations of all GHGs would continue to increase over the next century, but the extent and rates of change are difficult to predict, particularly on a sub-global scale such as the state of Idaho.

#### 3.11.1.2 Crystal Springs Hatchery Site

IDEQ measures concentrations of criteria pollutants at a number of locations around the state. The nearest monitors to the Crystal Springs hatchery site are in Pocatello. A monitor that measures sulfur dioxide is located about 11 miles from the Crystal Springs hatchery site, and a monitor that measures PM10 and PM2.5 is located about 15 miles from the site. The Pocatello monitors have not measured any violations of the NAAQS for criteria pollutants in recent years (EPA 2015b).

EPA has defined the Air Quality Index (AQI), which normalizes the measured hourly concentrations of various air pollutants to report air quality conditions as a single health indicator. The AQI defines pollutant levels as Good, Moderate, Unhealthy for Sensitive Groups, Unhealthy, and Very Unhealthy (Alert). The nearest AQI monitors to the Crystal Springs hatchery site are in Pocatello at the locations noted above. AQI data from the Pocatello monitors for the most recent five years of available data (2010–2014), based on PM10, PM2.5, and sulfur dioxide, indicate that the AQI has been Good on 77% of days, Moderate 22%, Unhealthy for Sensitive Groups 0.7%, and Unhealthy 0.3% of days (EPA 2015b). Table 3.11-1 presents the air quality index values and describes the levels of health concern.

**Table 3.11-1. Air Quality Index Values and Levels of Health Concern**

| Air Quality Index (AQI) Values<br>*When the AQI is in this range:* | Levels of Health Concern<br>*Air quality conditions area* |
|---|---|
| 0-50 | Good – Air quality is satisfactory and poses little or no health risk. |
| 51-100 | Moderate – Air quality is acceptable; however, pollution in this range may pose a moderate health concern for individuals particularly sensitive to ozone or particle pollution resulting in the experience of respiratory symptoms. |
| 101-150 | Unhealthy for Sensitive Groups – Individuals of sensitive groups (people with lung disease, children, older adults, individuals active outdoors) may experience health effects but the general public is unlikely to be affected. |
| 151 – 200 | Unhealthy – Most individuals may begin to experience health effects, and individuals of sensitive groups may experience more serious effects. |
| 201-300 | Very Unhealthy – Most individuals may experience more serious health effects. |
| 301-500 | Hazardous – Triggers health warnings of emergency conditions, the entire population is more likely to be affected by serious health effects. |

Source: AirNow.gov 2016

## 3.11.1.3 Yankee Fork Weir Facility

The nearest IDEQ air quality monitoring location to the Yankee Fork weir facility is in Ketchum, about 46 miles from the site. Historical AQI data from the Ketchum monitor, based on PM2.5, indicate that the AQI has been uniformly Good, except wildfires can cause occasional brief periods of Unhealthy or Very Unhealthy AQI (IDEQ 2010, 2015c). The Yankee Fork area is more remote and less populated than the Ketchum area. Consequently PM2.5 levels at Yankee Fork are likely to be lower than those measured at Ketchum, although these levels could be affected by wildfires, similar to Ketchum.

## 3.11.1.4 Panther Creek Weir Facility

The nearest IDEQ air quality monitor to the Panther Creek site is in Salmon, about 52 miles from the site. AQI data from the Salmon monitor for the most recent five years of available data (2010–2014), based on PM2.5, indicate that the AQI has been Good on 61% of days, Moderate 33%, Unhealthy for Sensitive Groups 4%, Unhealthy 1.4%, and Very Unhealthy 0.6% of days (EPA 2015b). PM2.5 levels can become elevated (defined as AQI of Unhealthy for Sensitive Groups, Unhealthy, or Very Unhealthy) during winter periods of air stagnation when local woodburning stove emissions build up in mountain valleys, as occurs at Salmon (IDEQ 2010). The area surrounding the Panther Creek site is more remote and less populated than the Salmon area, and consequently PM2.5 levels at Panther Creek are likely to be lower than those measured at Salmon.

## 3.11.2 Environmental Consequences

Construction projects are established as sources of air pollution and are subject to the provisions of Idaho air quality regulations. Typical air pollutants from construction sites include particulate matter (dust) from earthmoving and exposed earth surfaces, and exhaust emissions from equipment and vehicles including criteria pollutants and GHGs. During Hatchery Program operations, vehicle emissions and fossil fuel combustion for domestic heating, emergency electricity generation, and similar uses contribute criteria pollutants and GHGs. The hatchery and weir facilities do not fall within the categories of an industrial facility or agricultural operation that would have air quality emissions regulated by IDEQ.

### 3.11.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

Construction of hatchery facilities would cause emissions from vehicles and equipment as well as generation of dust. These emissions would be temporary and localized to the site and nearby roadways. Dust abatement measures would be applied (see Section 3.11.3, *Mitigation*). Therefore, the effects of construction activity on air quality would be **low**.

Emissions from the facility and associated vehicles during operations would be low because of the small size of the facility and because, according to the transportation analysis, the hatchery would generate only 10 or fewer vehicle trips per day (see Section 3.2.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, environmental consequences for the Crystal Springs hatchery). Accordingly, the effects of facility operation on air quality would be **low**. Construction and operation of the facility are not expected to lead to any violation of the NAAQS.

Small amounts of organic, potentially odorous wastes (e.g., liquid waste or settling pond sludge 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 and distributed as a fertilizer to the nearby Legacy Springs Wildlife Area. As a result, facility operation is not expected to lead to nuisance odor impacts.

#### Yankee Fork Weir Facility

The air quality and climate impacts of the Yankee Fork weir facility under Alternative 1 would be similar in nature to those of the Crystal Springs hatchery (see the above analysis of the Crystal Springs hatchery site). However, the amount of construction emissions would be smaller, reflecting the relative sizes of the facilities to be constructed. Emissions from operations and maintenance would be smaller, reflecting the differences in activities carried out at each facility. As a result, the air quality and climate impacts of the Yankee Fork weir facility under Alternative 1 would be **low** and would be less than those of the Crystal Springs hatchery.

#### Panther Creek Weir Facility

The air quality and climate impacts of the Panther Creek weir facility under Alternative 1 would be similar in nature to those of the Crystal Springs hatchery (see the above analysis of the Crystal Springs hatchery site). However, the amount of construction emissions would be smaller, reflecting the relative sizes of the facilities to be constructed. Emissions from operations and maintenance would be smaller, reflecting the differences in activities carried out at each facility. As a result, the air quality and climate impacts of the Panther Creek weir facility under Alternative 1 would be **low** and would be less than those of the Yankee Fork weir facility.

## Greenhouse Gas Emissions

EPA's Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98) requires reporting of greenhouse gas (GHG) emissions data for sources that emit 25,000 metric tons (MT) carbon dioxide equivalent ($CO_2e$[1]) or more per year. The rule requires federal reporting of GHG emissions; it does not require any other action.

Global atmospheric GHG concentrations are a product of emissions and tree and vegetation removal over time. Soil and non-tree vegetation disturbance caused by construction of the Hatchery Program could result in an increase in GHG concentrations. Research has shown that emissions resulting from soil disturbance are short lived and return to background levels within several hours (Kessavalou et al. 1998; IPCC 2006). Carbon that would be stored in removed vegetation would be offset in time by the growth and accumulation of carbon in soils and new vegetation. For these reasons, the temporary increase in GHG concentrations as a result of temporary soil and non-tree vegetation disturbance have not been quantified for this project.

Greenhouse gas emissions, primarily in the form of $CO_2$, $N_2O$, and methane, would be generated under the Hatchery Program through the use of vehicles and heavy equipment during construction. The following sections estimate the Hatchery Program's direct emissions.

Direct GHG emissions resulting from the Hatchery Program were calculated using the assumptions described in the GHG appendix (see Appendix E). Calculations were done for two types of activities that could produce GHG emissions: construction of the hatchery facilities and ongoing operation and maintenance of the facilities.

The Hatchery Program could result in an estimated total of 5,916 metric tons of $CO_2e$ emissions through the use of vehicles and equipment during 18 months of construction activities. As described further in Appendix E, GHG emissions associated with equipment operation and vehicle use were overestimated to account for all potential construction activities and associated material deliveries to and from the construction site.

The EPA mandatory reporting threshold for large emission sources of greenhouse gases is 25,000 metric tons of $CO_2e$ emitted annually (74 FR 56260). This threshold is approximately the amount of $CO_2e$ generated by 5,263 passenger vehicles per year (EPA 2015). Comparatively, the emissions generated during project construction would be equivalent to the emissions generated by about 833 passenger vehicles per year (EPA 2015). Operation of the hatchery facilities would translate into $CO_2e$ emissions about equal to that of 60.3 passenger vehicles per year (EPA 2015). Given the low emission contributions, the impacts of the Hatchery Program on GHG concentrations would be **low**.

The consensus among the scientific community is that future global climate change could alter existing meteorological patterns of local precipitation, local snowpack and snowmelt, local

[1] Carbon dioxide equivalent ($CO_2e$) is a measure used to compare various GHGs based upon their global warming potential. Global warming potential is a measure of the total energy that a gas absorbs over a particular period of time (usually 100 years), compared to carbon dioxide. The $CO_2e$ of carbon dioxide is defined as equal to 1. $CO_2e$ is commonly expressed as metric tons (MT $CO_2e$) or million metric tons (MMT $CO_2e$). The $CO_2e$ for emissions of a GHG is derived by multiplying the number of tons emitted by the associated global warming potential.

hydrology, and local groundwater recharge (IPCC 2007). As a result, it is possible that 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 Alternatives 1 and 2. As described in Section 3.5, *Groundwater and Surface Water Quality and 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 Alternatives 1 and 2, new wells and wellhead pumps would be installed to supplement the artesian flow and maintain the required water supply during peak months. These improvements would provide sufficient capacity to operate the hatchery facilities should decreases in groundwater levels occur. Therefore, the potential impacts from Alternatives 1 and 2 due to future climate change would be **low**.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, impacts on air quality associated with construction of the hatchery facilities would be the same as for full production under Alternative 1. Similar to full production, impacts would include emissions from construction equipment, as well as the generation of dust; however, these air quality impacts would be **low**.

Although production of Chinook salmon would be reduced by 50%, the operational impacts on air quality would be nearly the same as that described for full production under Alternative 1; however, one less staff person would be needed to operate the hatchery, which would result in fewer employee commute trips. Impacts would include emissions from the facility and associated vehicles; however these impacts would be low because of the small size of the facility and the hatchery would generate only 10 or few vehicle trips per day. In addition, fewer deliveries of smolt for outplanting would be needed, which would result in less air emissions. These impacts on air quality would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Therefore, construction-related impacts on air quality would also be the same. Similar to full production, impacts would include emissions from construction equipment, as well as the generation of dust; however, these air quality impacts would be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As described in Chapter 2, the Shoshone-Bannock Tribes (Tribes) would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Impacts would include emissions from employee commute trips; however, these air quality impacts related to operating the weir facilities would be **low**.

## 3.11.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with air quality at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

Under Alternative 2, most of the Yankee Fork weir facilities proposed under Alternative 1 would not be constructed. A temporary weir would continue to be installed and removed seasonally. Existing facilities would be used for adult holding ponds, juvenile acclimation ponds, and operator RV parking. Because minimal equipment would be needed to operate the Yankee Fork weir facilities under Alternative 2, emissions resulting from Yankee Fork operations would be low. Consequently, air quality impacts of the Yankee Fork weir facility under Alternative 2 would be **low** and less than under Alternative 1.

### Panther Creek Weir Facility

Under Alternative 2, most of the Panther Creek weir facilities proposed under Alternative 1 would not be constructed. A temporary weir, adult fish trap, and juvenile acclimation facility would be installed and removed seasonally. Because minimal equipment would be needed to operate the Panther Creek weir facilities under Alternative 2, emissions resulting from Panther Creek operations would be low. Consequently, air quality impacts of the Panther Creek weir facility under Alternative 2 would be **low** and less than under Alternative 1.

### Greenhouse Gas Emissions

Under Alternative 2, construction and operational impacts associated with climate change at the Crystal Springs hatchery would be the same as described under Alternative 1 and would remain **low**.

Most of the Yankee Fork and Panther Creek weir facilities would not be constructed and temporary weirs would be removed seasonally. Less infrastructure development would result in less construction-related impacts on climate change. Operational impacts on climate change would likely remain the same as under Alternative 1. Impacts on climate change from construction and operation of hatchery facilities would remain **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weir at the Yankee Fork and Panther Creek sites. As a result, there would be **no** air quality impacts related to construction.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be nearly the same under the reduced production option as under the full production option for Alternative 2. As detailed in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Minimal equipment would be needed to operate the Yankee Fork and Panther Creek weir facilities under both production options under Alternative 2, which would not result in a discernible increase in air emissions. Air quality impacts related to operating the weir facilities would be **low**.

# 3.11.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on air quality and climate change during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.11.3.1 Alternative 1

### Construction

#### Crystal Springs Hatchery Site

The Tribes would implement the following best management practices to minimize air quality impacts associated with construction at the Crystal Springs hatchery:

- Sequence and schedule construction work to minimize the amount of bare soil exposed to wind erosion.
- Use water trucks to control dust during construction, as needed.
- If dust-abatement additives or stabilization chemicals (typically magnesium chloride, calcium chloride salts, or lignin sulfonate) are used, the following additional measures would be implemented:
    - Do not apply dust-abatement additives and stabilization chemicals within at least 25 feet of surface water (distances might be greater where vegetation is sparse) and apply them so as to minimize the likelihood that they would enter the water.
    - Do not use petroleum-based products for dust abatement.
    - Avoid application of dust abatement chemicals during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to surface water.

  - Ensure spill containment equipment is available during application of dust abatement chemicals.
- Transport all vegetation or other debris associated with construction clearing to an approved landfill or composting facility, as applicable. Burning of all such material would not be done; some small-scale vegetation burning may be done for weed control on access roads.
- Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust 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.
- 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 or LED bulbs and turning off computers and other electronic equipment every night.
- Recycle or salvage nonhazardous construction and demolition debris where practicable.

#### Yankee Fork and Panther Creek Weir Facilities

The same mitigation measures recommended for construction at the Crystal Springs hatchery would be implemented at the Yankee Fork and Panther Creek weir facilities.

### Operations

#### Crystal Springs Hatchery Site

The Tribes would implement the following best management practices to minimize air quality impacts associated with operations at the Crystal Springs hatchery:

- Handle and dispose of all potentially odorous waste during operation in a manner that does not generate odorous emissions.
- Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.
- Implement vehicle idling restrictions.
- Reduce electricity use during facility operation by using compact fluorescent or LED bulbs and turning off computers and other electronic equipment every night.
- Recycle or salvage waste generated during facility operation, where practicable.

#### Yankee Fork and Panther Creek Weir Facilities

The same mitigation measures recommended for Crystal Springs hatchery operations would be implemented at the Yankee Fork and Panther Creek weir facilities.

### 3.11.3.2 Alternative 2

#### Construction

The same mitigation measures recommended for Alternative 1 at the Crystal Springs hatchery site would also be implemented under Alternative 2. No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended.

#### Operations

The same mitigation measures recommended for Alternative 1 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would also be implemented under Alternative 2.

## 3.11.4 No Action Alternative

No new facilities would be constructed and no improvements to existing facilities would be made under the No Action Alternative. Therefore, there would be no construction emissions under this alternative and no changes in emissions from existing facilities, and accordingly there would be **no** air quality or climate impacts.

# 3.12 Visual Quality

This section describes the affected environment and environmental consequences, including mitigation measures, associated with visual resources resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level (of up to 1 million smolts) and a 50% production level. This section also summarizes the federal Wild and Scenic Rivers Analysis presented in Appendix D for the scenery outstandingly remarkable value (ORV), which is considered in the visual quality, affected environment, and the environmental consequences analysis for Panther Creek.

Visual resources are all objects (human-made and natural, moving and stationary) and features (e.g., landforms and waterbodies) visible on a landscape. These resources add to or detract from the scenic quality of the landscape (i.e., the visual appeal of the landscape). A visual impact is the creation of an intrusion or perceptible contrast that affects the scenic quality of a landscape. A visual impact can be perceived by an individual or group as either positive or negative, depending on a variety of factors or conditions (e.g., personal experience, time of day, and weather/seasonal conditions).

## 3.12.1 Affected Environment

The visual resources analysis area is defined as the area of visual effect (AVE) that is made up of viewsheds, or what people can see in the landscape. The AVE and its viewsheds are defined by the physical constraints of the environment and the physiological limits of human sight. Physical constraints of the environment include landform, land cover, and atmospheric conditions. Landform is a major factor in determining the AVE because it can limit views or provide an elevated perspective for viewers. Similarly, land cover such as trees and buildings can limit views while low-growing vegetation and the absence of structures can allow for unobscured views. Atmospheric conditions such as smoke, dust, fog, or precipitation can temporarily reduce visibility.

The physiological limits of human sight are affected by location, proximity, and light. Location refers to the topographic position of the viewer, such as being even with or above or below what is being observed. Proximity is broken down into three distance zones: foreground (up to 0.5 mile from the viewer), middleground (0.5 mile to 3 to 5 miles from the viewer), and background (from 3 to 5 miles to infinity). Features in the landscape are more dominant and have a greater importance the closer they are to the viewer, whereas importance is reduced the further away features are from the viewer. This is because details and features in the landscape, including program elements, become lost and comprise a smaller portion of the total landscape as distance from the viewer increases. In the background, the scale and color of existing landscape elements and program features blend so that only broad forms, large-scale patterns, and muted colors are evident. Light influence also plays a large role in affecting views—for example, during the daytime views are more readily available than at night when darkness greatly reduces the ability to see details and color in the landscape without bright moonlight or artificial light sources. In addition, lighting levels change throughout the day, making color and individual forms more prominent with more light and less distinct as light decreases.

The environment's physical constraints and limits of human sight combine to provide for viewsheds that range from restrictive to expansive and AVEs that range from smaller and more confined to larger and wider reaching (Federal Highway Administration 2015:4-5–4-9, 6-3–6-4; Litton 1968:3–5).

For the Hatchery Program, the visual resources analysis area is made up of three independent AVEs, which are described in more detail in the following sections. The three independent AVEs are the Crystal Springs hatchery site AVE, the Yankee Fork weir facility AVE, and the Panther Creek weir facility AVE. The Yankee Fork and Panther Creek weir facilities AVEs are located on Forest Service lands, while the Crystal Springs hatchery site AVE is not.

#### 3.12.1.1 Viewer Sensitivity

Viewer sensitivity is based on viewer exposure and viewer awareness. Viewer exposure is a factor of proximity to an object or scene that is affected by elevation and distance; the number of people viewing an object or scene (more viewers equals more exposure); and how long viewers experience an object or scene. Viewer awareness is influenced by how routine a scene is (i.e., lower sensitivity with increased routine), visual features or focal points that help to focus the viewer's attention, and legal or social protection of a resource. Movement also affects viewer sensitivity by creating dynamic viewsheds that change as the viewer moves through the landscape. Speed affects how long or short a view is based on the mode of travel, and the availability of views is affected by the surrounding terrain and vegetation and the presence or absence of built features.

Viewer sensitivity varies by the type of viewer, viewer activity, and visual expectations. For example, people driving for pleasure; people engaging in recreational activities such as hiking, biking, or camping; and homeowners generally have higher viewer sensitivity to views. Viewers using recreational trails and areas, scenic highways, and scenic overlooks usually pay more attention to their surroundings, seek views, and have higher regard for the landscape composition. Residential viewers typically have extended viewing periods and are more concerned about and aware of changes in the views from their homes. Sensitivity tends to be lower for people driving to and from work or as part of their work, because commuters and non-recreational travelers typically have fleeting views and tend to focus on traffic rather than on surrounding scenery (Federal Highway Administration 2015: 6-2–6-4; USFS 1995: 3-3–3-13; U.S. Soil Conservation Service 1978: 3, 9, 12).

Evaluating visual quality and viewer response must also be based on a regional frame of reference (U.S. Soil Conservation Service 1978: 3). The same visual resource appearing in different geographic areas could have a different degree of visual quality and associated viewer sensitivity in each setting. For example, a small hill may be a significant visual element on a flat landscape but have very little significance in mountainous terrain.

#### 3.12.1.2 Crystal Springs Hatchery Site

The Crystal Springs hatchery site is located off River Road in Bingham County, north of the American Falls Reservoir (Figure 3.12-1). The site is located adjacent to McTucker Creek and a series of remnant ponds left over from a defunct hatchery that was located on the same site. The AVE is characterized by low-growing sagebrush and grassland areas, riparian trees and shrubs, and wetland vegetation growing on the proposed hatchery site, which is bordered on the north and east by agricultural lands (Figure 3.12-2, Photo 1). Areas to the south and east of the AVE are characterized by a braided network of creeks and drainages, wetlands, and riparian areas that comprise the delta of the Snake River, which drains into the reservoir. The AVE is mostly undeveloped besides gravel and paved rural roadways, irrigation infrastructure for agricultural lands, wooden-poled utility lines, wire fencing, and concrete raceways and an abandoned building associated with the old hatchery (Figure 3.12-2, Photos 2 and 3). The topography of the AVE is flat to gently rolling.

Most views toward the proposed hatchery site, including views from River Road, are limited to the foreground by trees and shrubs associated with the natural areas within the AVE, which prevent views of the existing building located on the site (Figure 3.12-2, Photo 4). However, flatter agricultural lands that are mostly free of trees and shrubs allow for background views of Big Southern Butte to the northwest and the Bannock Range and Deep Creek Mountains to the south. While middleground views of the site are available from local roadways and residences along Edwards Road, details are obscured by site vegetation, the gently rolling terrain, and distance (Figure 3.12-3, Photos 5 and 6). The McTucker Island Cooperative Wildlife Management Area is located approximately 0.5 mile south of the proposed hatchery site, off River Road, and has a boat ramp and overnight camping. While it is close to the proposed hatchery site, views from this area, including the picnic shelters located near the entrance off River Road (Figure 3.12-3, Photos 7 and 8), are blocked by trees and shrubs.

Viewers of the proposed hatchery site include roadway users on River Road and agricultural workers in fields that are located directly adjacent to the site. Viewer sensitivity is expected to be low due to the small number of viewers present and because viewers would have intermittent, short-term views of the site in passing while driving or working the nearby fields.

**Figure 3.12-1. Crystal Springs Hatchery Site Area of Visual Effects**

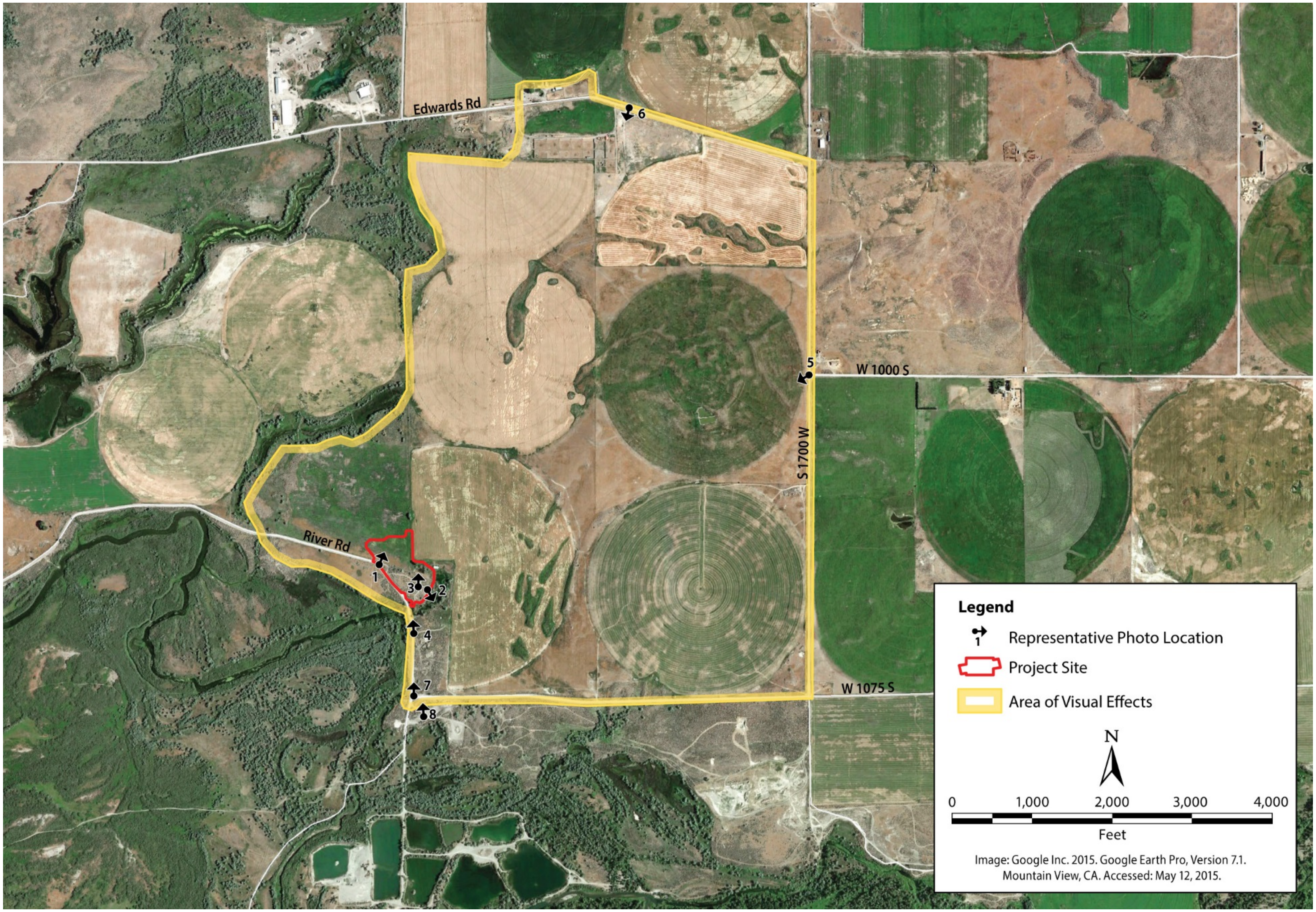

**Figure 3.12-2. Representative Photos—Crystal Springs Hatchery Site Area of Visual Effects**

Photo 1. Looking northeast from River Road toward the proposed employee housing.

Photo 2. Looking south from the hatchery site toward the remnant concrete raceways.

Photo 3. Looking north from the hatchery site toward the old hatchery building.

Photo 4. Looking north from River Road toward the proposed hatchery site.

**Figure 3.12-3. Representative Photos—Crystal Springs Hatchery Site Area of Visual Effects**

Photo 5. Looking west from road South 1700 West toward the proposed hatchery site.

Photo 6. Looking southwest from Edwards Road toward the proposed hatchery site.

Photo 7. Looking north from the entrance of the McTucker Island Cooperative Wildlife Management Area, at the bend in River Road, toward the proposed hatchery site.

Photo 8. Looking north from the picnic structures near the entrance of the McTucker Island Cooperative Wildlife Management Area toward the proposed hatchery site.

### 3.12.1.3 Forest Service Lands

As described in Section 3.12.1, *Affected Environment*, the Yankee Fork and Panther Creek weir facilities are located on Forest Service lands. Title FSM 2380.43.4-5 of the Forest Service Manual requires that projects on Forest Service lands “conduct and document a scenery assessment for all activities that may affect scenic resources and that require analysis under the National Environmental Policy Act. Ensure application of the principles of landscape aesthetics, scenery management, and environmental design in project-level planning.” This is achieved by using the Forest Service’s Visual Management System.

Effect indicators for visual resources focus on the changes to the existing visual setting and the experiences provided by the attractions and requirements established through Salmon-Challis Forest Plan Visual Quality Objective (VQO) class designations (Table 3.12-1) that are defined by the Agriculture Handbook 462, Visual Management System (USFS 1974). The visual indicators are: 1) changes to the existing setting that could affect VQO designations; and 2) compliance with the Standards and Guidelines for Management Areas. Finally, professional judgments gained on similar projects elsewhere on National Forest System lands contributed to the evaluation of potential effects.

#### Yankee Fork Weir Facility

##### Existing Scenic Character and VQO Designations

The Yankee Fork weir facility is located off Yankee Fork Road within the Challis Yankee Fork Ranger District of the Salmon-Challis National Forest. The Yankee Fork weir facility AVE falls within the Retention VQO designation (see Table 3.12-1 and Figure 3.12-4). The AVE is limited to the area immediately surrounding the facility because the tall, conical terrain of the Salmon River Mountains create an enclosed, narrow valley (Figure 3.12-5, Photo 1) and the curvilinear roadway (consisting of curved lines) limits views (Figure 3.12-5, Photo 2) beyond the AVE. The roadway winds through the tall, vertical lodgepole pine forest stands that cover the numerous rising peaks and slopes of the Salmon River Mountains, extending down to the banks of the Yankee Fork. The Yankee Fork travels over and around exposed gravel bars and deposits, including remnant dredge tailings from historic silver and gold mining (Figure 3.12-5, Photo 3). Riparian vegetation, consisting mainly of willows and alder, are located in thin bands along the Yankee Fork corridor and in adjacent wetland areas. These dark green pine forests contrast against the lighter green of the grassy mountain slopes, deciduous trees, and understory shrubs near the Yankee Fork that give way to hues of yellow, orange, and brown in the fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, primarily on north-facing slopes, and small patches to larger areas of grass and herbaceous vegetation are present where larger openings exist and on south-facing slopes. In addition, dead, fire-charred snags can be seen on hillsides affected by the 2000 Rankin fire. The Pole Flat Campground, located within the AVE, is accessed off Yankee Fork Road (Figure 3.12-5, Photo 4).

**Table 3.12-1. Visual Quality Objectives and Definitions**

| Visual Quality Objective | Objective Definition |
|---|---|
| Preservation | Only ecological changes are allowed.<br>Management activities are prohibited, except for recreation facilities with very low visual impact. |
| Retention | Management activities are not visually evident.<br>Activities may only repeat form, line, color, and texture found in characteristic landscape, and changes in the size, amount, intensity, direction, and pattern of these visual elements should not be evident. |
| Partial Retention | Management activities are visually subordinate to characteristic landscape.<br>Activities may repeat form, line, color, and texture found in characteristic landscape, and changes in the size, amount, intensity, direction, and pattern of these visual elements should remain visually subordinate.<br>New or uncommon patterns of form, line, color, and texture may be added to the characteristic landscape through management activities as long as they are visually subordinate. |
| Modification | Management activities may visually dominate the characteristic landscape.<br>Activities resulting in changes in landform and vegetation cover must borrow from form, line, color, and texture found naturally in the landscape and at a scale that is also naturally occurring nearby.<br>Infrastructure features, such as buildings, roads, and signs, should mimic form, line, color, texture, and scale that are compatible with the surrounding landscape. |
| Maximum Modification | Management activities may visually dominate the characteristic landscape.<br>Activities must appear as natural occurrences within surrounding area when viewed as background, but can appear out of keeping with naturally established form, line, color, texture, and scale when viewed in the foreground or middleground.<br>Infrastructure features, such as buildings, roads, and signs, should be visually subordinate when viewed as background. |
| Unacceptable Modification | Management activities are excessive.<br>Activities and infrastructure appear to have an excessive contrast in form, line, color, texture, and scale and are visually unrelated to landform and vegetative patterns in characteristic landscape. |

Source: USFS 1974: 28-39.

**Figure 3.12-4. Yankee Fork Weir Facility, Area of Visual Effects**

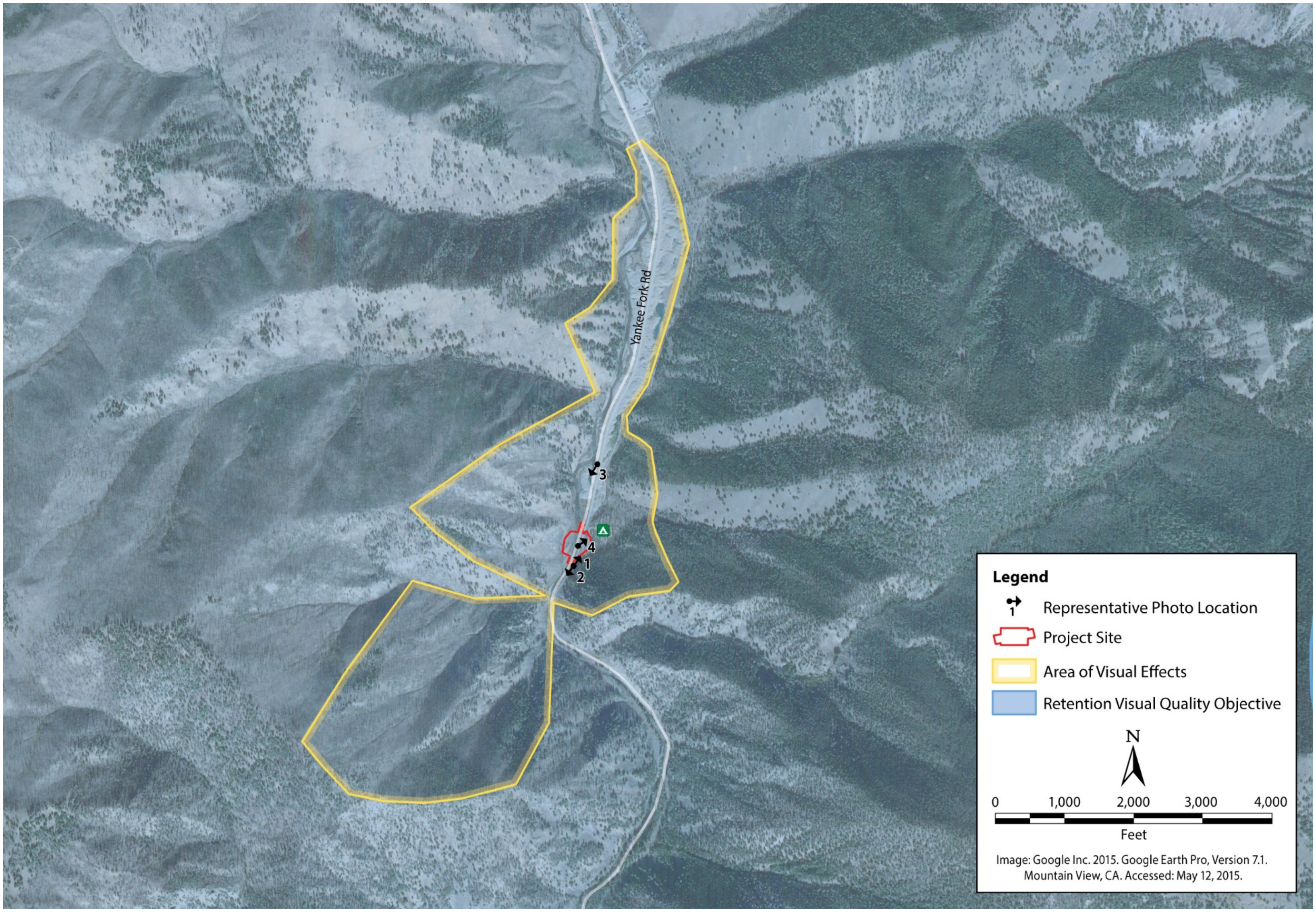

**Figure 3.12-5. Representative Photos—Yankee Fork Weir Facility**

Photo 1. Looking north from Yankee Fork Road toward the proposed satellite facility.

Photo 2. Looking south from Yankee Fork Road, south of the proposed satellite facility, toward the bend in the road.

Photo 3. Looking southwest from an existing culvert outfall into the river toward the proposed satellite facility and existing dredge tailings.

Photo 4. Looking northeast from Yankee fork Road toward the Pole Flat Campground access road.

The most prominent visual elements in the landscape include the steep mountainous terrain, pine-covered slopes, exposed grassy slopes, the Yankee Fork, and dredge tailings. In addition, smaller rock outcroppings; seasonal interest such as wildflowers in the spring, deciduous fall colors, and snow covered mountains; open canopy areas (e.g., meadows and remnant mine areas); and wildlife and plant viewing also comprise the visual landscape.

The majority of the Yankee Fork weir facility is visible from key viewpoints along Yankee Fork Road and from the banks of the Yankee Fork, which are used for fishing. Roughly 400 vehicles per day use Yankee Fork Road during the peak season (Section 3.2, *Transportation*, Section 3.2.1.2, *Yankee Fork Weir Facility*). The Yankee Fork weir facility may be only partially visible from the Pole Flat campground because trees and shrubs obscure direct views; however, campers have more direct views as they pass by the site when entering and exiting the site and when fishing along the river. Views in the AVE vary, from immediate foreground views consisting of the Yankee Fork, conifer and riparian trees, and mountain slopes, to foreground and middleground views of the rising grassy and forested mountain peaks. Typically, views of the background do not exist due to the lack of vantage points high enough to allow views over the surrounding terrain and tall vegetation and terrain in the foreground and middleground. Large burn scars such as those created by the Rankin fire are visible within the AVE. Unpaved or gravel forest roadways, minimal signage, a small number of recreation- and operations-related structures, the temporary weir, and historic dredge tailings make up most of the visual presence of management activities.

Viewers of the proposed facility include roadway users on Yankee Fork Road, campers at Pole Flat Campground, operators of the weir, and those fishing along the river. Viewer sensitivity is expected to be moderate to moderately high. Among the moderate amount of viewers present, viewers on the roadway would have intermittent, short-term views of the site in passing while driving, while viewers who are fishing and camping within the AVE are likely repeat users who come to the area specifically to enjoy its recreational and visual values.

## Panther Creek Weir Facility

### Existing Scenic Character and VQO Designations

The Panther Creek weir facility is located off of Panther Creek Road within the Salmon-Cobalt Ranger District of the Salmon-Challis National Forest, across from the Cobalt Work Center. The Panther Creek weir facility and most of the facility's AVE falls within the Retention VQO designation (see Table 3.12-1 and Figure 3.12-6). A small portion of the AVE also falls within the Partial Retention and Modification VQO designations. The AVE is limited to the area immediately surrounding the facility because the mounding terrain of the numerous surrounding ridgelines create an enclosed, narrow valley (Figure 3.12-7, Photo 1) and the curvilinear roadway limits views beyond the AVE (Figure 3.12-7, Photo 2). The roadway winds through the tall, vertical Douglas-fir forest stands that cover the numerous slopes of the ridgelines, extending down to the banks of Panther Creek. Riparian vegetation, consisting mainly of alder, dogwood, willows, and cottonwood, are located in thin bands along the Panther Creek corridor and in adjacent wetland areas. The dark green pine forests contrast against the lighter green of the grassy mountain slopes, deciduous trees, and understory shrubs near Panther Creek that give way to hues of yellow, orange, and brown in the fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, primarily on north-facing slopes, and small patches to larger areas of grass and herbaceous vegetation are present where larger openings exist and on south-facing slopes. A grassy meadow is located along the eastern bank of the creek, north of the bridge where the weir would be built (Figure 3.12-7, Photo 3). In addition, dead, fire-charred snags can be seen within the AVE on hillsides affected by the 2000 Clear Creek fire.

The most prominent visual elements in the landscape includes the mounded ridgelines, fir-covered slopes, exposed grassy slopes, Panther Creek, and the meadow. In addition, the white and green U.S. Forest Service (USFS) Cobalt Work Center cabins and buildings and wooden jackleg and split-rail fencing; seasonal interest such as wildflowers in the spring, deciduous fall colors, and snow covered mountains; and wildlife and plant viewing also comprise the visual landscape.

The majority of the Panther Creek weir facility is visible from key viewpoints along Panther Creek Road and from the banks of Panther Creek, which are used for fishing. Roughly 36 vehicles per day use Panther Creek Road during the peak hunting season in September and October (Section 3.2, *Transportation*, Section 3.2.1.3, *Panther Creek Weir Facility*). However, mature trees and shrubs obscure most views of the weir facility from the roadway. Views are primarily available from areas immediately adjacent to Panther Creek weir features. The Panther Creek weir facility is only partially visible from the USFS Cobalt Work Center because trees and shrubs obscure most direct views. Views in the AVE vary from immediate foreground views including Panther Creek, conifer and riparian trees, and the USFS facilities, to distant foreground views of the rising grassy and forested terrain. Typically, views of the middleground and background do not exist due to the lack of vantage points high enough to allow views over the surrounding terrain and tall vegetation. Burn scars and dead snags, such as those created by the Clear Creek fire, are visible within the AVE. Bridges and unpaved or gravel forest roadways, minimal signage, and the USFS facility and associated fences make up most of the visual presence of management activities.

Viewers of the proposed facility include roadway users on Panther Creek Road, USFS staff, and those fishing along the creek. Viewer sensitivity is expected to be moderate to moderately high. While there are a small number of viewers present, and viewers on the roadway would have intermittent, short-term views of the site in passing while driving, those fishing within the AVE are likely repeat users who come to the area specifically to enjoy its recreational and visual values.

**Figure 3.12-6. Panther Creek Weir Facility, Area of Visual Effects**

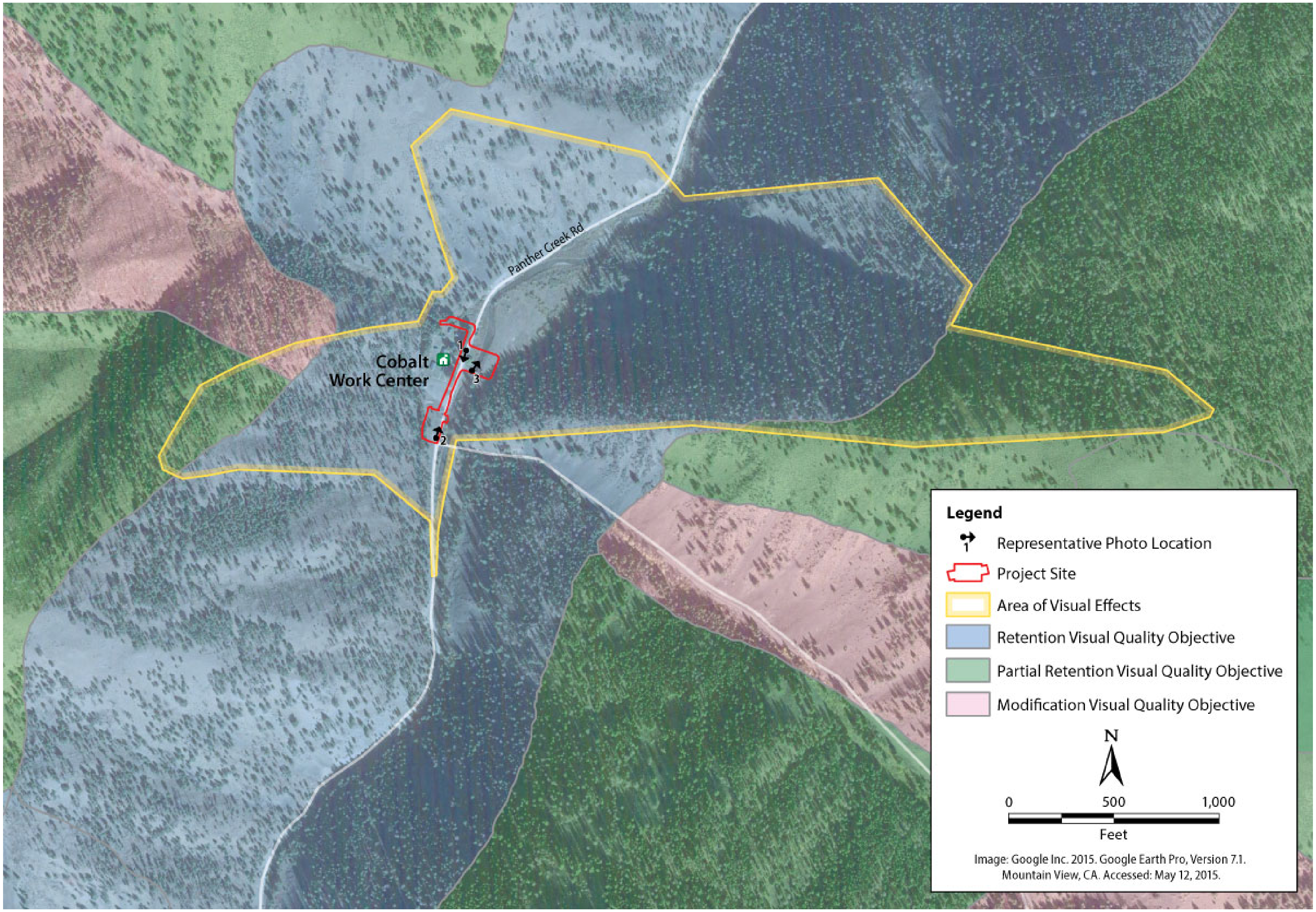

**Figure 3.12-7. Representative Photos—Panther Creek Weir Facility**


Photo 1. Looking southwest from Panther Creek Road toward the existing USFS Cobalt District Ranger Station and proposed satellite facility.

Photo 2. Looking northeast from Panther Creek Road toward the existing USFS Cobalt District Ranger Station and proposed satellite facility.

Photo 3. Looking northeast from the bridge over Panther Creek toward the existing meadow and proposed satellite facility.

**Wild and Scenic Rivers Act**

As described above, the Panther Creek watershed is a unique and scenic area with striking contrasts between areas of extensive resource development and disturbance (for example from mining activities) and areas with relatively little evidence of human use. Panther Creek Road is often recommended as a scenic tour route, and along this route travelers experience wide-open panoramic scenes of forests on north-facing slopes, open sage and grassland vegetative communities on south-facing slopes, narrow canyons with striking geologic features, and a river that changes dramatically from season to season and from landscape to landscape. It is for these reasons that Panther Creek is recognized for the scenery ORV under the Wild and Scenic Rivers Act (Appendix D).

The diversity of striking scenery is most evident in the lower half of Panther Creek. The section of Panther Creek that runs along the location of the proposed Panther Creek weir facility site is comparatively unremarkable, though still scenic. The setting of the Panther Creek weir facility site does not display the striking canyon features nor open vistas discussed above. Near the facility site, the road winds through a narrow canyon that limits views of the surrounding scenery, without eye-catching rock outcrops or dramatic canyon features. The location of the Panther Creek weir facility site does not contain the scenic features that the USFS recognized as outstandingly remarkable when they determined Panther Creek, as a whole, eligible for Wild and Scenic River consideration.

## 3.12.2 Environmental Consequences

Visual impacts are determined by assessing the compatibility of proposed changes to existing visual resources and predicting viewer sensitivity to those changes which, combined, aid in determining the degree of impact (Federal Highway Administration 2015:6-1). Impacts can be beneficial or detrimental. Viewer sensitivity to change in the visual environment, combined with the resource change, determines the extent of visual impacts caused by the construction and operation of the proposed project. A project can be considered to have an impact if it would conflict with state and local ordinances and regulations, if it would conflict with USFS visual quality objectives, or if there is a substantial change to visual resources that affects sensitive viewers. The following conditions would affect these objectives:

- Substantial degradation of the character or scenic quality of a visually important landscape on Bingham County and USFS lands. Landscape alterations that do not comply with USFS VQO designations because alterations exceed the threshold of effects. The threshold of effects is exceeded when alterations visually dominate the characteristic landscape and variety of the visual resources in relation to the forests' visual character as viewed from the key observation points of viewsheds.
- Substantial dominant visual changes in the landscape that are seen at highly sensitive viewer locations such as community enhancement areas (community gateways, roadside parks, viewpoints, and historic markers) or locations with special scenic, historic, recreation, cultural, archaeological, or natural qualities that have been recognized as such through legislation or some other official declaration.
- Unresolved conflict with visual standards identified by a federal land management agency (e.g., USFS, Bureau of Land Management, National Park Service).

- Substantial increase in light and glare in the surrounding area.
- Long-term (that is, persisting for 2 or more years) adverse visual changes or contrasts to the existing landscape as viewed from areas with high viewer sensitivity.

#### 3.12.2.1 Alternative 1: Hatchery Program with Permanent Weirs

### Crystal Springs Hatchery Site

**Construction**

Construction of the proposed hatchery under Alternatives 1 and 2 would create temporary changes in views of and from the surrounding area. Construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks into the viewshed of River Road and nearby agricultural fields. However, heavy equipment associated with agriculture is common to the area and construction would last for no longer than 18 months. In addition, the number of affected viewers would be low and they would have moderately low viewer sensitivity. Therefore, construction would result in temporary visual effects but impacts would be **low**.

**Operations**

Once in operation, the proposed hatchery would be similar in scale to nearby development associated with rural residences and agricultural operations. The single story hatchery building and employee housing, vehicle maintenance and shop building, parking lot, and turn-around area would look similar to the buildings and site features associated with existing nearby development. As shown in Figure 3.12-3, Photos 5 through 8, existing built features associated with the hatchery site are not discernible and proposed hatchery features would not be discernible from a short distance away from the site due to intervening vegetation and gently rolling terrain. Vegetation along McTucker Creek and around the old hatchery building would not be affected and would, therefore, provide partial visual screening of new features associated with the proposed hatchery, as seen from River Road and adjacent agricultural fields (see Figure 3.12-2, Photos 1 through 4). The relocation of powerlines would appear visually similar to existing conditions and the new four-wire livestock fencing with entrance gates would visually complement existing fencing and gates within and near the AVE. The outdoor rearing ponds, new groundwater wells, retrofitted wells, and settling pond would not be visually apparent because of their scale and profile and due to the presence of new buildings and existing vegetation that would screen views of these features. Therefore, because they would be similar to existing development in the area and because there are few viewers with moderately low viewer sensitivity, it is anticipated that built features would result in **low** impacts on visual resources.

The hatchery and shop buildings and well houses would be surfaced with prefinished metal siding, with concrete block accents, and a prefinished steel roof. The employee garages and rearing pond enclosure would also have prefinished steel roofs to match. However, very lightly colored buildings could introduce new surfaces that could create a source of nuisance glare to drivers on River Road. In addition, new lighting associated with the proposed hatchery could result in nuisance light spill and glare if not properly designed and installed. Mitigation measures identified for the Crystal Springs hatchery site (Section 3.12.3.1, *Crystal Springs Hatchery Site*) would reduce impacts associated with glare and light resulting in a **low** overall impact.

## Yankee Fork Weir Facility

Under Alternative 1, the temporary weir and field station would be replaced with a permanent structure that would be located in close proximity to where the current weir is installed each year. A permanent bridge weir, fish ladder, holding ponds, spawning and egg preparation structure, storage shed, and in-stream intake structure would be introduced into the AVE and the existing Yankee Fork Road would be relocated 20 to 30 feet to the east to accommodate the new facilities. Gravel access roads would service the fish trap infrastructure. There would also be two RV pads and landscaped berms that separate the roadway from the proposed facility.

### Construction

Construction of the weir facility would create temporary changes in views of and from the surrounding area. Construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks, into the viewshed of Yankee Fork Road, the river and river banks, and potentially the Pole Flat Campground. However, construction would last for no longer than 4 months. Although viewer sensitivity is moderate to moderately high, and the number of affected viewers at the site and traveling along Yankee Fork Road would be moderate, construction would result in temporary visual effects that would likely be **low**.

### Operations

Once in operation, the proposed spawning and holding pond building and storage sheds would be similar in scale to nearby development associated with the historic gold mining camp located to the north. The bridge weir would be larger and taller than the temporary weir, but would not introduce a new visual element into the existing landscape; therefore, it would constitute a similar visual condition. The fish ladder would be a new element, but would appear to be a visually continuous element associated with the proposed weir and facility buildings. The relocated roadway, parking lot, and turn-around area would not stand out, and landscaped berms would provide screening of the proposed facilities. While some vegetation along the river would be removed to build the permanent structures, much of the nearby vegetation would not be affected, and therefore would provide partial visual screening of new features associated with the proposed facility, as seen from Yankee Fork Road and the adjacent campground. The proposed acclimation ponds would be located amongst dredge tailings where there is an existing ponded area, and would not substantially alter views at this location.

Facility buildings would be surfaced with metal and corrugated steel siding and a corrugated steel roof. However, very light-colored building surfaces could introduce a source of nuisance glare to campers at Pole Flat Campground, those fishing in the river, and drivers on Yankee Fork Road. Color selection could also make the buildings stand out in the visual landscape. In addition, new lighting associated with the proposed weir facility could result in nuisance light spill and glare if not properly designed and installed. Mitigation measures identified for the Crystal Springs hatchery site (Section 3.12.3.1, *Crystal Springs Hatchery Site*) would reduce adverse effects associated with glare and light and ensure that buildings blend in with the visual landscape. In addition, standard chain link security fencing stands out and is more visible compared to dark colored fencing. Mitigation measures identified for the Yankee Fork weir facility (Section 3.12.3.2, *Yankee Fork and Panther Creek Weir Facilities*) would ensure that security fencing recedes into the visual landscape. While viewers have moderate to moderately high viewer sensitivity, with implementation of these mitigation measures, it is not anticipated that built features would result in adverse visual effects because they would be similar to existing development in the area. The Retention VQO would also be met. In addition, the recreation settings, recreation values, availability of recreation facilities and activities, and the visual character of the AVE would not be adversely affected. Thus, the impacts of the Yankee Fork weir facility on visual resources would be **low**.

## Panther Creek Weir Facility

The Panther Creek weir facility would be very similar to that proposed for the Yankee Fork weir facility, only smaller in scale. However, there is no temporary weir currently being installed at Panther Creek. A permanent bridge weir, fish ladder, holding ponds, spawning and egg preparation structure, storage shed, and in-stream intake structure would be introduced into the AVE.

### Construction

Construction of the weir facility would create temporary changes in views of and from the surrounding area. Construction activities would introduce heavy equipment and associated vehicles, including dozers, graders, scrapers, and trucks into the viewshed of Panther Creek Road, the creek and creek banks, and the USFS Work Center. However, construction would last for no longer than 4 months. Although viewer sensitivity is moderate to moderately high, and the number of affected viewers at the site and traveling along Panther Creek Road would be moderately low, construction would result in temporary visual effects that would likely be **low**.

### Operations

Once in operation, the proposed spawning and holding pond building and storage sheds would be similar in scale to nearby development associated with the adjacent Cobalt Work Center. The bridge weir would introduce a new visual element into the existing landscape; however, it would be placed downstream of the existing bridge over the creek, so it would be in close proximity to an existing, similar visual condition associated with a creek crossing. The fish ladder would be a new element, but would appear to be a visually continuous element associated with the proposed weir and facility buildings. While some vegetation in proximity to the weir would be removed to build the permanent structures, much of the nearby vegetation would not be affected, and therefore would provide partial visual screening of new features associated with the proposed facility, as seen from Panther Creek Road and the adjacent Cobalt Work Center.

Facility buildings would be surfaced with metal and corrugated steel siding and a corrugated steel roof. While very light-colored building surfaces could introduce a new source of glare to staff at the Cobalt Work Center, to those fishing in the creek, and to drivers on Panther Creek Road, the existing work center buildings have white walls and green roofs. Therefore, appropriate color selection would enable the proposed buildings to complement the existing visual landscape. In addition, new lighting associated with the proposed weir facility could result in nuisance light spill and glare if not properly designed and installed. The proposed acclimation holding ponds that would be located west of Panther Creek Road would introduce rounded, aboveground structures into a landscape where existing buildings are rectangular. Therefore, they would be visually dissimilar and could detract from existing views if not properly designed.

Mitigation measures identified for the Crystal Springs hatchery site (Section 3.12.3.1, *Crystal Springs Hatchery Site*) would reduce adverse effects associated with glare and light, ensure that proposed buildings blend in with the visual landscape, and allow the proposed acclimation pond and associated structures to recede into the visual landscape, rather than stand out amongst the rectangular buildings. In addition, standard chain link security fencing stands out and is more visible compared to dark colored fencing, which could detract from views. Mitigation measures identified for the Panther Creek weir facility (Section 3.12.3.2, *Yankee Fork and Panther Creek Weir Facilities*) would ensure that security fencing recedes into the visual landscape.

While viewer sensitivity to visual changes at the site would be moderate to moderately high, it is not expected that built features would result in visual effects because it is anticipated that viewers would perceive the proposed weir facility in a favorable manner due to the beneficial effects of restoring fish populations and because proposed structures would blend in with or recede into the visual landscape with implementation of the proposed mitigation measures. The Retention VQO associated with the facility and the surrounding Retention, Partial Retention, and Modification VQOs would also be met. In addition, the impact on recreation settings, recreation values, availability of recreation facilities and activities, and the visual character of the AVE would likely be **low**.

### Wild and Scenic Rivers Act

Under Alternative 1, potential impacts on the scenery ORV would be the construction of a modern, industrial-appearing facility on Panther Creek adjacent to the historic Cobalt Work Center. To minimize these impacts, the facility would be painted and textured to be consistent with existing structures nearby. The scale of the developed areas would be limited to meet the needs of the Hatchery Program, and the location of the Panther Creek weir facility would be situated in a relatively confined canyon where it would not affect the views of background scenery which are consistent with values for the scenery ORV. Additionally, there would be the potential for the Panther Creek weir facility to attract public interest. The installation of interpretative signage explaining the purpose and function of the facility could have a positive scenic and recreational impact.

Given the scale of the Panther Creek weir facility, its proximity to existing development, its location within the canyon, and the allowance for some level of development and structures under the recreation classification for Wild and Scenic River status, impacts on the scenery ORV would be **low**.

## 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option would be the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Therefore, visual quality impacts associated with construction of the hatchery facilities under the reduced production option would be the same as for full production. Similar to full production, construction would result in temporary visual effects (e.g., the introduction of heavy equipment into the viewshed); however, these impacts would be **low**.

Although production of Chinook salmon would be reduced by 50%, the appearance of hatchery facilities during operations would be the same as for full production under Alternative 1. Therefore, visual quality impacts associated with Crystal Springs hatchery operations would have the same impacts as full production under Alternative 1. Similar to full production, new built features would be similar to existing development in the area and there are few viewers with moderately low viewer sensitivity. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and at Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 1. Therefore, visual quality impacts associated with construction of the weir facilities under the reduced production option would be the same as for full production. Similar to full production, construction would result in temporary visual effects (e.g., the introduction of heavy equipment into the viewshed); however, these impacts would be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As described in Chapter 2, the Shoshone-Bannock Tribes (Tribes) would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, with implementation of mitigation measures, it is not anticipated the permanent weir facilities would result in adverse visual effects because they would be similar to existing development in the area and the visual character of the AVE would not be adversely affected. Visual quality impacts related to operating the weir facilities would be **low**.

## 3.12.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with visual quality at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

Alternative 2 would continue to install a temporary weir structure, similar to existing conditions. In addition, the designated campsite at Pole Flat Campground would not affect existing visual conditions. Therefore, Alternative 2 would not adversely affect existing visual resources or the visual quality of the AVE, and the Retention VQO would be met. In addition, impacts on the recreation settings, recreation values, availability of recreation facilities and activities, and the visual character of the AVE would likely be **low**.

### Panther Creek Weir Facility

Alternative 2 would install a temporary weir structure that would introduce a new visual element into the existing landscape; however, it would be placed downstream of the existing bridge over the creek, so it would be in close proximity to an existing, similar visual condition associated with a creek crossing. In addition, temporary fiberglass acclimation tanks would be introduced into the visual landscape. While viewer sensitivity to visual changes at the site would be moderate to moderately high, it is not expected that the proposed temporary features would result in adverse visual effects because it is anticipated that viewers would perceive the proposed weir facility in a favorable manner due to the beneficial effects of restoring fish populations and because proposed temporary weir structures would only be introduced into the landscape for 3.5 months each year. In addition, the designated campsite at the work center would not affect existing visual conditions. Therefore, Alternative 2 would not adversely affect existing visual resources or the visual quality of the AVE, and the Retention VQO associated with the facility and the surrounding Retention, Partial Retention, and Modification VQOs would be met. In addition, the recreation settings, recreation values, availability of recreation facilities and activities, and the visual character of the AVE would likely be **low.**

## Wild and Scenic Rivers Act

Construction and operations under Alternative 2 to the Wild and Scenic Rivers Act scenery ORV at Panther Creek would be the same as under Alternative 1. Given the scale of the Panther Creek weir facility, its proximity to existing development, its location within the canyon, and the allowance for some level of development and structures under the recreation classification for Wild and Scenic River status, impacts on the scenery ORV would be **low**.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

Impacts related to the construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at Yankee Fork and at Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weirs at the Yankee Fork and Panther Creek sites. As a result, there would be **no** construction-related impacts associated with visual quality.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the 50% production option as for full production under Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Similar to full production, it is not expected the proposed temporary features would result in adverse visual effects because it is anticipated that viewers would perceive the proposed weir facility in a favorable manner due to the beneficial effects of restoring fish populations and because the temporary weir structures would only be introduced into the landscape for a short period of time. For these reasons, visual quality impacts related to operating the weir facilities would be **low**.

## 3.12.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on visual resources during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.12.3.1 Alternative 1

#### Construction

No mitigation is recommended for construction activities at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites under Alternative 1.

#### Operations

##### Crystal Spring Hatchery Site

*Reduce Glare from Buildings and Apply Minimum Lighting Standards.* Use of similar building materials and colors to those found in nearby development would aid in helping the facility to blend with its local surroundings and reduce the appearance of the wall surface. Walls would have low-sheen and non-reflective surface materials to reduce potential for glare. The use of smooth troweled surfaces and glossy paint would be avoided. In addition, white or light-colored surfaces would be avoided for the Crystal Springs hatchery and Yankee Fork weir facility because the use of earth-toned colors that complement the surrounding landscape would help to reduce the effects of glare. The Yankee Fork weir facility would consider using colors that complement or match nearby historic structures, such as browns or dark tans. The exception to using white colors would be at the Panther Creek weir facility, where the use of white walls and green roofing would enable the facility to better blend with existing USFS buildings that are adjacent to the site. However, coloring the sides of the acclimation holding ponds a shade that is two to three shades darker than the general surrounding area such as a dark evergreen, black, or dark brown color would help these round structures to recede into the visual landscape, rather than stand out amongst the square and rectangular buildings. In addition, the pumping station, degas tower, and aboveground piping would be colored to match the acclimation holding ponds. Appropriate paint types would be selected for the finished material to ensure environmental safety and long-term durability of the painted surfaces. The appropriate operating agency or organization would maintain the paint color over time.

All artificial outdoor lighting is to be limited to safety and security requirements and would be designed using Illuminating Engineering Society's design guidelines and in compliance with International Dark-Sky Association approved fixtures. All lighting is to provide minimum impact on the surrounding environment and would utilize downcast, cut-off type fixtures that are shielded and direct the light only towards objects requiring illumination. Therefore, lights would be installed at the lowest allowable height and cast low-angle illumination while minimizing incidental light spill onto adjacent properties, open spaces, or backscatter into the nighttime sky. The lowest allowable wattage would be used for all lighted areas and the number of nighttime lights needed to light an area would be minimized to the highest degree possible. Light fixtures would have non-glare finishes that would not cause reflective daytime glare. Lighting would be designed for energy efficiency, use high-pressure sodium vapor lights with individual photocells, and have daylight sensors or be timed with an on/off program. Lights would provide good color rendering with natural light qualities with the minimum intensity feasible for security, safety, and personnel access. Lighting, including light color rendering and fixture types, would be designed to be aesthetically pleasing.

Lights along pathways and safety lighting at building entrances and loading areas would employ shielding to minimize off-site light spill and glare and be screened and directed away from employee housing and adjacent uses to the highest degree possible. The amount of nighttime lights used along pathways and in parking areas would be minimized to the highest degree possible to ensure that spaces are not unnecessarily over-lit. For example, the amount of light can be reduced by limiting light posts to higher use areas and by using hooded wall mounts or bollard lighting on travel way portions of pathways.

Technologies to reduce light pollution evolve over time and design measures that are presently available may help, but may not be the most effective means of controlling light pollution once the hatchery is designed. Therefore, all design measures used to reduce light pollution would employ the technologies available at the time of hatchery design to allow for the highest potential reduction in light pollution, which would result in low impacts from glare caused by the new facilities.

#### Yankee Fork and Panther Creek Weir Facilities

Refer to Alternative 1 mitigation measure, *Reduce Glare from Buildings and Apply Minimum Lighting Standards,* described for the Crystal Spring Hatchery.

*Reduce Visibility of the Security Fencing.* The following mitigation measures would reduce visibility of the security fencing associated with the proposed Yankee Fork and Panther Creek weir facilities:

- New fencing associated with the proposed weir facilities would be designed in a manner that allows these features to blend with the surrounding built and natural environments so that the new features complement the visual landscape.
- Any proposed fencing would be powder-coated and colored a shade that is two to three shades darker than the general surrounding area, such as a dark evergreen, black, or dark brown color. These darker colors would allow fencing to recede into the visual landscape as much as possible and allow for more transparent views through the fencing. Light or bright colors would be avoided because such colors, including the grey stainless steel associated with standard chain link fencing, creates more of a visual barrier that pulls visual focus, is less transparent, and increases glare. Appropriate paint types would be selected for the finished material to ensure environmental safety and long-term durability of the painted surfaces. The appropriate operating agency or organization would maintain the paint color over time. Fencing would be managed and maintained for a well-kept appearance.
- Vandalism, graffiti, or damage would be abated semi-annually to maintain the effectiveness and attractiveness of the visual mitigation prescribed herein.
- Interpretive signage would be posted explaining the purpose and function of the facilities.

### 3.12.3.2 Alternative 2

#### Construction

No mitigation is recommended for construction activities at the Crystal Springs hatchery, Yankee Fork site, and Panther Creek site under Alternative 2.

#### Operations

##### Crystal Spring Hatchery Site

Refer to Alternative 1 mitigation measure, *Reduce Glare from Buildings and Apply Minimum Lighting Standards,* described for the Crystal Spring Hatchery.

##### Yankee Fork and Panther Creek Weir Facilities

No mitigation is recommended for operations at the Yankee Fork and Panther Creek sites under Alternatives 2.

## 3.12.4 No Action Alternative

Under the No Action Alternative, visual resources are expected to remain very similar to existing conditions. No features associated with the hatchery and the weir facilities proposed under Alternative 1 (full production and 50% production) or Alternative 2 (full production and 50% production) would be constructed and introduced into the AVE, and site resources would not be affected. Therefore, the No Action Alternative would not directly or indirectly affect the existing scenic character, VQO designations, recreation settings, recreation values, or the availability of recreation facilities or activities within the AVE. This impact is considered **low**. In addition, the temporary weir facility that is currently installed each year on the Yankee Fork would no longer be installed after 2016, eliminating its visual presence. This may be perceived as a beneficial improvement (a **low positive** impact) on views within the AVE because it would reduce structures seen along the river, or it could be perceived as a negative change (a **low** impact) on views in the area because fish populations could be reduced, creating a decline in viewers accessing and enjoying the river.

# 3.13 Noise

This section describes the affected environment and environmental consequences, including mitigation measures, associated with noise resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the hatchery on areas of human use[1] under two Chinook salmon production level options: the proposed production level (up to 1 million smolts produced) and a 50% production level.

Noise is generally considered to be 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 3.13-1 contains examples of common activities and their associated noise levels in dBA.

**Table 3.13-1. Common Activities and Associated Noise Levels**

| Source at a Given Distance | A-Weighted Sound Level in Decibels (dBA) | Qualitative Description |
|---|---|---|
| Carrier deck jet operation | 140 | |
| | 130 | Pain threshold |
| Jet takeoff (200 feet) | 120 | |
| Auto horn (3 feet) | 110 | Maximum vocal effort |
| Jet takeoff (1,000 feet)<br>Shout (0.5 feet) | 100 | |
| New York subway station<br>Heavy truck (50 feet) | 90 | Very annoying<br>Hearing damage<br>(8-hour, continuous exposure) |
| Pneumatic drill (50 feet) | 80 | Annoying |
| Freight train (50 feet)<br>Freeway traffic (50 feet) | 70 | Intrusive<br>(telephone use difficult) |
| Air conditioning unit (20 feet) | 60 | |
| Dishwasher (next room) | 50 | Quiet |
| Living room, bedroom | 40 | |
| Library, soft whisper (5 feet) | 30 | Very quiet |
| Broadcasting/recording studio | 20 | |
| | 10 | Just audible |

Source: Adapted from New York Department of Environmental Conservation 2001 (Table E, Assessing and Mitigating Noise Impacts).
dBA = A-weighted sound level in decibels.

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

[1] Noise impacts on wildlife are discussed in Section 3.8, *Wildlife*.

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.

## 3.13.1 Affected Environment

The analysis area for noise includes adjoining land within 1,000 feet of the proposed hatchery site and weir facilities, and land within 500 feet of public roads used by commuter vehicles and delivery trucks accessing the proposed hatchery and weir facilities.

Sensitive noise receptors[2] in the analysis area include off-site residences, campgrounds, and recreational uses such as fishing areas and trails used for hiking, horseback riding, and bicycling. Use of trails would be transitory and noise exposure would only occur within the areas immediately adjacent to the site.

Existing noise sources consist of local agricultural operations and occasional vehicle traffic on local roads. Typical ambient noise levels in rural and agricultural areas are approximately 45 dBA during the day and 35 dBA at night (U.S. Environmental Protection Agency 1971).

### 3.13.1.1 Crystal Springs Hatchery Site

The nearest residence to the proposed Crystal Springs hatchery site is approximately 1 mile away. There are no established recreational use areas adjacent to the Crystal Springs hatchery site. There may be occasional recreational fishing at local creeks and ponds in the general vicinity of the site, but this is assumed to be infrequent. The proposed residential units at the hatchery site would be occupied by paid Tribal employees, and are not considered to be noise-sensitive receptors. Average daily traffic counts of less than 100 vehicles per day were reported on River Road and adjacent roads (Reich pers. comm.).

### 3.13.1.2 Yankee Fork Weir Facility

Pole Flat Campground is located adjacent to the proposed weir facility. There is a cluster of structures 1–2 miles north of the Yankee Fork site that is assumed to include seasonal or year-round residential use. Average daily traffic counts of 386 vehicles per day were reported on Yankee Fork Road in 2010 (Reich pers. comm.).

### 3.13.1.3 Panther Creek Weir Facility

There are housing units adjacent to the Panther Creek site, which are used seasonally by U.S. Forest Service (USFS) employees. Horse packing also originates from this site. There are trails used for hiking and horseback riding in the surrounding area. The nearest residential uses outside of the adjacent site are over 2 miles to the north of the proposed facility. Average daily traffic counts of less than 100 vehicles per day were reported on Panther Creek Road (Reich pers. comm.)

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[2] Noise impacts on wildlife are discussed in Section 3.8, *Wildlife*.

## 3.13.2 Environmental Consequences

The assessment of potential construction and operation noise levels is based on methodology developed by the Federal Transit Administration. Potential effects associated with construction activities would be temporary and intermittent, and would cease once work is complete. For fixed noise sources (point sources), sound levels attenuate by about 7.5 dBA per doubling of distance over vegetation-covered ground. For mobile sources such as traffic (line sources), sound levels typically attenuate by about 4.5 dBA per doubling of distance over vegetation-covered ground (Federal Transit Administration 2006).

Noise emissions produced by conventional construction equipment typically range from about 80 to 90 dBA at a distance of 50 feet (Federal Transit Administration 2006). Typical noise emissions of construction equipment are shown in Table 3.13-2.

**Table 3.13-2. Typical Construction Equipment Noise Emission Levels**

| Equipment | Typical Noise Level (dBA) 50 Feet from Source |
|---|---|
| Grader | 85 |
| Bulldozers | 85 |
| Truck | 88 |
| Backhoe | 80 |
| Pneumatic tool | 85 |
| Excavator | 85 |
| Concrete mixer | 85 |
| Generator | 81 |
| Pump | 76 |

Source: Federal Highway Administration 2006.
dBA = A-weighted decibel.

### 3.13.2.1 Alternative 1: Hatchery Program with Permanent Weirs

#### Crystal Springs Hatchery Site

##### Construction

Depending on seasonal weather conditions, construction of the hatchery facility is estimated to take up to 18 months to complete. Potential noise levels resulting from construction of the proposed hatchery were evaluated by taking the logarithmic sum of noise levels from the two loudest pieces of equipment that would likely operate at the same time (an excavator and a truck), and multiplying by a 40% usage factor (percent of time equipment is in operation). The combined maximum noise level is 90 dBA at 50 feet. Estimated hourly-average sound levels from construction activities as a function of distance, based on calculated point-source attenuation over vegetation-covered (i.e., soft) ground, are shown in Table 3.13-3.

**Table 3.13-3. Construction Equipment Noise Emission Levels**

| Distance from Source to Receiver (feet) | Hourly-Average Noise Level (dBA) |
|---|---|
| 50 | 86[a] |
| 100 | 78 |
| 200 | 70 |
| 400 | 62 |
| 600 | 58 |
| 800 | 54 |
| 1,000 | 52 |
| 1,200 | 50 |
| 1,400 | 48 |
| 1,600 | 46 |
| 1,800 | 45 |
| 2,000 | 44 |

Source: Federal Highway Administration 2006.
dBA = A-weighted decibel.
[a] Based on maximum equipment noise level of 90 dBA and a 40% usage factor.

The results in Table 3.13-3 indicate that construction equipment operating at the hatchery site may be discernible above ambient noise (i.e., 5 dB over ambient levels) at about 1,200 feet away from the construction equipment, assuming an ambient noise level of 45 dBA. The closest residences are more than 1 mile away from the proposed construction zone. Therefore, it is unlikely that temporary construction noise would be discernible at the closest off-site residences, and noise impacts on residents would be low. Proposed on-site residences would be occupied by paid Tribal employees, and are not considered to be sensitive noise receptors. There may be occasional recreational fishing at creeks and ponds in the general vicinity of the site, but this is assumed to be infrequent. Therefore, temporary impacts on recreational use of the surrounding land during construction are considered to be **low**.

### Operation

Permanent noise sources during facility operation include wellhead pumps supplying artesian spring water to the facility, large recirculation pumps, mechanical water-chilling equipment, and a 500-kilowatt diesel-powered backup generator that would be tested occasionally during normal business hours. The wellhead water supply pumps for the proposed hatchery would consist of either normal agricultural in-well turbine pumps that are inherently quiet, or at-grade centrifugal pumps inside weather enclosures that include noise reduction.

The recirculation pumps, backup generator, and mechanical water chillers at the hatchery would be either inside the building or in dedicated enclosures. Ventilated enclosures would reduce equipment noise levels at exterior locations by 10 dBA. If equipment is completely enclosed, noise reduction values of well over 20 dBA are possible.

Alternative 1-related truck traffic would be used to deliver supplies to the hatchery or carry smolts to off-site stocking areas. Alternative 1-related volumes on public roads would constitute a small fraction of the existing traffic volume served by these roads, resulting in an overall increase of less than 1 dBA in traffic noise levels.

Therefore, permanent noise impacts during operation are expected to be **low**.

## Yankee Fork Weir Facility

Construction of the weir facility is estimated to take up to four months to complete. The use of heavy equipment would likely be required for two phases of construction: the realignment of an approximately 425-foot–long segment of Yankee Fork Road around the weir facility, and temporary re-routing of Yankee Fork River for dewatering of the location where in-water structures would be constructed. Both of these Hatchery Program features would take up to an estimated two weeks to complete. A heavy truck and an excavator or grader would be the two loudest pieces of equipment likely operating at the same time. Estimated hourly-average sound levels from construction activities are shown in Table 3.13-3. The results in Table 3.13-3 indicate that construction equipment operating at the facility site may be discernible above ambient noise (i.e., 5 dBA over ambient levels) at about 1,200 feet away from the construction equipment, assuming an ambient noise level of 45 dBA. Equipment noise would be intermittently discernible at campsites in Pole Flat Campground. Given the expected duration of heavy equipment use, and the commitment by the Shoshone-Bannock Tribes (Tribes) to conduct the road grading and realignment in close coordination with Custer County and the USFS to avoid any unnecessary complications with visitors to Yankee Fork or local residents, this impact is expected to be **low**.

Operation of weir facility equipment is not anticipated to contribute significantly to ambient levels. The water intake would be gravity-fed and would not require the use of pumps. There is a generator set located next to the holding ponds that is assumed to be used only during power outages and for occasional testing. There would be commuter traffic from trucks and workers accessing the facility: it is assumed that this would add fewer than 10 daily trips to average daily traffic on Yankee Fork Road, which would not be a discernible increase. Therefore, permanent noise impacts during operation are expected to be **low**.

## Panther Creek Weir Facility

Construction of the weir facility is estimated to take up to four months to complete. The use of heavy equipment would likely be required for temporary re-routing of Panther Creek for dewatering of the location where permanent in-water structures would be constructed, and for construction of intakes, pipelines, and holding tanks for the weir facility. This would take up to an estimated two weeks to complete. A heavy truck and an excavator would be the two loudest pieces of equipment likely operating at the same time. Estimated hourly-average sound levels from construction activities are shown in Table 3.13-3. The results in Table 3.13-3 indicate that construction equipment operating at the facility site may be discernible above ambient noise (i.e., 5 dBA over ambient levels) at about 1,200 feet away from the construction equipment, assuming an ambient noise level of 45 dBA. Equipment noise would be intermittently discernible at USFS housing units adjacent to the Panther Creek site. Given the expected duration of heavy equipment use, and the commitment by the Tribes to conduct the road grading and realignment in close coordination with Lemhi County and the USFS to avoid any unnecessary complications with visitors to Panther Creek or residents, this impact is expected to be **low**.

Operation of weir facility equipment is not anticipated to contribute significantly to ambient noise levels. A pump station would be located at the site to feed acclimation ponds, but this would be located 9 feet below existing grade. There would be commute traffic from trucks and workers accessing the facility; it is assumed that this would add fewer than 10 daily trips to average daily traffic on Panther Creek Road, which would not be a discernible increase. Therefore, permanent noise impacts during operation are expected to be **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Similar to full production, noise-related impacts associated with the use of construction equipment while constructing the hatchery facilities under the reduced production option would be **low**.

Although production of Chinook salmon would be reduced by 50%, operational impacts at the hatchery related to noise would be essentially the same as that described for full production under Alternative 1. Noise-related impacts would include noise associated with pumps generators, and water chillers, which would be operated at about the same frequency as under full production. Noise-related impacts also include noise associated with truck traffic to deliver supplies to the hatchery. Therefore, noise-related impacts associated with Crystal Springs hatchery operations would be similar to those impacts described for full production. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. Similar to full production, construction noise would be intermittently discernible at Pole Flat Campground (Yankee Fork) and at the USFS housing units (Panther Creek); however, these impacts would be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Impacts would include a small amount of commuter and truck traffic on Yankee Fork Road and Panther Creek Road, which would not result in a discernible increase in traffic noise levels. Noise impacts related to operating the weir facilities would be **low**.

## 3.13.2.2 Alternative 2: Hatchery Program with Temporary Weirs

### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with noise at the Crystal Springs hatchery would be the same as described under Alternative 1.

### Yankee Fork Weir Facility

Under Alternative 2, a temporary weir and traps would be installed on Yankee Fork. There would be no construction equipment or permanent sources of operating noise. Alternative 2 would generate a small amount of commuter and truck traffic on Yankee Fork Road, which would not result in a discernible increase in traffic noise levels. Impacts under Alternative 2 to noise would be **low**.

### Panther Creek Weir Facility

Under Alternative 2, a temporary weir and traps would be installed on Panther Creek. There would be no construction equipment or permanent sources of operating noise. Alternative 2 would generate a small amount of commuter and truck traffic on Panther Creek Road, which would not result in a discernible increase in traffic noise levels. Impacts on noise under Alternative 2 would be **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weir at the Yankee Fork and Panther Creek sites. As a result, there would be **no** noise-related construction impacts.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as under the full production option for Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Impacts would include a small amount of commuter and truck traffic on Yankee Fork Road and Panther Creek Road, which would not result in a discernible increase in traffic noise levels. Noise impacts related to operating the weir facilities would be **low**.

## 3.13.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts related to noise during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.13.3.1 Alternative 1

#### Construction

The Tribes would implement the following best management practices to minimize noise levels associated with construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites:

- Schedule construction work during daylight hours between 7:00 a.m. and 9:00 p.m.
- Locate stationary construction equipment as far away from noise-sensitive receptors as possible.
- Require sound-control devices that are at least as effective as those originally provided by the manufacturer on all construction equipment powered by gasoline or diesel engines.
- Select pumps and backup generators that do not generate excessively high noise levels.

#### Operations

No mitigation is recommended for operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.13.3.2 Alternative 2

#### Construction

For the Crystal Springs hatchery, implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery. No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation is recommended.

#### Operations

No mitigation is recommended for operations at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

## 3.13.4 No Action Alternative

Under the No Action Alternative, construction of the Hatchery Program would not take place and associated traffic would not access the sites. There would be **no** impacts on noise under the No Action Alternative.

# 3.14 Public Health and Safety

This section describes the affected environment and environmental consequences, including mitigation measures, associated with public health and safety resulting from implementing Alternative 1, Alternative 2, and the No Action Alternative for the Crystal Springs Hatchery Program (Hatchery Program). As part of Alternatives 1 and 2, the analysis also addresses impacts of the operation of the Hatchery Program under two Chinook salmon production level options: the proposed production level (production of up to 1 million Chinook salmon smolts) and a 50% production level.

## 3.14.1 Affected Environment

### Infrastructure and Environmental Hazards

The analysis area for infrastructure includes the county and local public services that serve the Crystal Springs hatchery, the Yankee Fork, and the Panther Creek sites. The analysis area for environmental hazards includes the adjacent area within 100 feet of each site boundary. In addition, for the Yankee Fork and Panther Creek weir facilities, which are alongside streams, the cumulative impact analysis area extends 0.25-mile downstream of each site.

Because the sites are generally flat, and because Hatchery Program construction would not excavate into steep slopes, environmental hazards related to landslides, slope failures, or other earth surface processes are not likely to occur at the Crystal Springs hatchery site, Yankee Fork weir facility, and Panther Creek weir facility. Flooding is also not known to occur at the Crystal Springs hatchery site and the Yankee Fork site; however, the Panther Creek site is known to flood during spring run-off, which typically occurs from late April through late May. The risk of wildfire also poses an environmental hazard at the Yankee Fork and Panther Creek weir facilities because both sites are located near forested terrain.

The Environmental Protection Agency, Food and Drug Administration *Advisory on Mercury in Fish and Shellfish* (EPA 2016) has identified salmon as one species of fish that is lowest in mercury.

### Hazardous Materials

The analysis area for hazardous materials includes the Crystal Springs hatchery site, the Yankee Fork weir facility, and the Panther Creek weir facility, as well as the adjacent land within 500 feet of each site boundary and surface soil and groundwater within 100 feet of each site boundary. It also includes surface water in McTucker Creek, which flows along the southern boundary of the Crystal Springs hatchery site into the American Falls Reservoir. Additionally, it includes Yankee Fork and Panther Creek, within 1 mile downstream of each site, as this zone could be affected if a spilled material entered the water body during construction or operation.

### Energy

The analysis area for energy includes the service area that encompasses the Crystal Springs hatchery site, the Yankee Fork weir facility, and the Panther Creek weir facility. This area includes parts of southern Idaho and eastern Oregon. Electricity is provided to the Crystal Springs hatchery site and the Panther Creek site by Idaho Power, which serves over 515,000 customers in Idaho and Oregon, with 95% of its customer base in Idaho. In 2014, Idaho Power sold 17.3 million megawatt hours of electricity to its customers in Idaho (Idaho Power 2015). The Salmon River Electric Cooperative, which purchases its power from the Bonneville Power Administration, provides electricity to the Yankee Fork site (Dize pers. comm.). The Salmon River Electric Cooperative is a rural electric cooperative delivering retail electric service to approximately 2,500 electric accounts in south central Idaho including parts of Custer, Lemhi, and Blaine Counties. The cooperative derives a large percentage of its revenue from electric sales to Thompson Creek Mine; the second largest industry in the service area is agriculture (Salmon River Electric Cooperative 2016).

Electricity for operation of the hatchery and hatchery residences at the Crystal Springs hatchery site would be provided by Idaho Power using the overhead three-phase power line that currently transects the site. Power lines would be redirected as necessary to accommodate the final locations of the proposed facility and housing. Idaho Power would also provide electricity to operate the Panther Creek weir facility from existing overhead power lines (Stone pers. comm. 2015h). The Salmon River Electric Cooperative would provide electricity to operate the Yankee Fork weir facility using existing overhead power lines (Dize pers. comm.)

Diesel fuel and gasoline for construction equipment and delivery trucks is refined and distributed by several refineries in the mountain states region. In 2013, approximately 415 million gallons of all distillate fuels, including Number 2 diesel fuel,[1] were sold in Idaho (USEIA 2015). Operations of the Crystal Springs hatchery and hatchery residences would use approximately 6,300 gallons of diesel per year. The Yankee Fork and Panther Creek weir facilities would each use an average of 10,000 gallons of diesel for on-road vehicles (Reiser pers. comm. 2015d).

#### 3.14.1.1 Crystal Springs Hatchery Site

The Crystal Springs hatchery site is located approximately 3 miles southeast of Springfield in Bingham County, Idaho. The site consists of two parcels on which the proposed hatchery and hatchery employee residences would be constructed: a 9-acre east parcel and a 6.5-acre Legacy Springs parcel to the north. Current conditions on the east parcel consist of a nonoperational trout hatchery, which includes a small building, six artesian wells from which groundwater naturally emerges, outdoor concrete raceways, and a series of ponds that are fed from the groundwater wells. There are currently no structures on the western parcel. The surrounding lands include private land to the east and to the west, Bureau of Reclamation land to the southwest, and the Legacy Springs Wildlife Area to the north.

The following sections describe the affected environment for infrastructure and environmental hazards, hazardous materials, and energy use at the proposed Crystal Springs hatchery site.

[1] No. 2 diesel fuel is used in high-speed diesel engines that are generally operated under uniform speed and load conditions such as those in trucks and automobiles (USEIA 2015), and thus would be the primary petroleum distillate used at each site during construction.

### Infrastructure and Environmental Hazards

A combination of county and local agencies provide public health and safety resources for the Crystal Springs hatchery site. Police protection is provided by the Bingham County Sheriff's Department. Fire protection may be provided by either the Aberdeen Fire Department or the Blackfoot Fire Department, depending on availability and response time. For health and medical services, Bingham County Memorial Hospital is the closest full-service hospital, while Aberdeen has an urgent care facility (Health West) for walk-in nonemergencies. Local law enforcement departments coordinate emergency 911 calls and dispatch for fire districts, police, and emergency medical services for Bingham County (Stone pers. comm. 2015i).

The landscape at the site slopes to the south and east from the higher ground at the north and west portions of the site. The ground slope increases on the eastern and southern boundaries as elevations drop down to McTucker Creek and the series of wetland ponds. The ponds, which collect water from artesian wells and potentially from subsurface flow, are connected by short channels extending from north to south. A 24-inch culvert under River Road to the south conveys water from the wells into McTucker Creek, which drains southwest toward the delta of the American Falls Reservoir in the Snake River basin. Flooding does not occur at the Crystal Springs hatchery site (Stone pers. comm. 2015e).

### Hazardous Materials

No hazardous materials are currently used or stored at the proposed hatchery site. Soil and groundwater at the site are not known to be contaminated with hazardous materials.

### Energy

Idaho Power provides power to the site via an overhead three-phase power line that transects the site; however, there are currently no operational facilities at this site and no energy is currently in use.

## 3.14.1.2 Yankee Fork Weir Facility

The Yankee Fork weir facility would be located adjacent to the U.S. Forest Service (USFS) Pole Flat Campground and Yankee Fork Road, a county road primarily used for recreational access to the National Forest. The site is located on the east side of the Yankee Fork, a tributary to the Salmon River. Currently, under a USFS special use permit, the Shoshone-Bannock Tribes (Tribes) have set up a temporary weir structure in the river for trapping fish, and use a clearing near the entrance to the Pole Flat Campground as a staging area for equipment and vehicles. The temporary weir is placed in Yankee Fork during the upstream Chinook salmon run that spans from mid-June through early September.

### Infrastructure and Environmental Hazards

A combination of county and local agencies provide public health and safety resources for the Yankee Fork weir facility. Police protection is provided by the Custer County Sheriff's Department. Fire protection may be provided by either the North Custer Rural Fire District or the Sawtooth Valley Rural Fire District, depending on availability and response time. Health and medical services may be provided by the Salmon River Clinic in Stanley, Idaho, or St. Luke's Wood River Medical Center in Hailey, Idaho. Local law enforcement departments coordinate emergency 911 calls and dispatch for fire districts, police, and emergency medical services for Custer County (Stone pers. comm. 2015i).

The Yankee Fork valley is about 300 feet wide where the proposed facilities would be constructed. The land east of Yankee Fork Road and south of Pole Flat Campground is a generally flat terrace feature that slopes gently to the south. The land on the river's west bank rises abruptly to a terrace feature higher than the eastern terrace, which is isolated from the adjacent hillslope by what appears to be a former high flow channel of the Yankee Fork. The channel banks are approximately 7 feet tall and elevations rise quickly just east and west of the proposed work area beyond the toes of the hillslopes. Yankee Fork is artificially constrained by extensive piles of dredge tailings placed during gold dredging activities in the 1940s and 1950s (U.S. Bureau of Reclamation 2012). Flooding does not occur at the Yankee Fork weir facility (Stone pers. comm. 2015e).

#### Hazardous Materials

There are currently no hazardous materials used or stored at this location. Soil and groundwater at the site are not known to be contaminated with hazardous materials.

#### Energy

The Yankee Fork weir facility currently uses a generator powered by two 5-gallon propane tanks that are filled once a week and sustain seasonal operations from mid-June through early September. The Salmon River Electric Cooperative provides power to the site via overhead power lines; however, there are currently no operational facilities at this site that use electricity (Dize pers. comm.; Stone pers. comm. 2015h).

### 3.14.1.3 Panther Creek Weir Facility

The Panther Creek weir facility is located on site within the Cobalt Work Center. USFS staff use the center during the summer months to coordinate field activities and forest fire response. There are approximately a dozen structures and a gravel parking lot associated with the center located on the west side of Panther Creek Road. A small bridge crosses Panther Creek at the center providing access to pasture on the east side of Panther Creek, a tributary to the Salmon River. No fish trapping facilities are currently located at this site.

#### Infrastructure and Environmental Hazards

A combination of county and local agencies provide public health and safety resources for the Panther Creek weir facility. Police protection is provided by the Lemhi County Sheriff's Department. Fire protection may be provided by either the North Custer Rural Fire District or the Salmon Fire Department, depending on availability and response time. Health and medical services are provided by the Steele Memorial Hospital in Salmon, Idaho. Local law enforcement departments coordinate emergency 911 calls and dispatch for fire districts, police, and emergency medical services for Lemhi County (Stone pers. comm. 2015i).

The Panther Creek valley contains a generally flat terrace feature about 500 feet wide where the proposed facilities would be constructed. The channel banks are approximately 5 to 7 feet tall and elevations rise quickly on hillslopes that adjoin both margins of valley floor. Panther Creek is constrained by Panther Creek Road (National Forest Road 55) on the west bank, and by a less-travelled gravel access road on the east bank. Panther Creek could flood above its banks during spring run-off during years when there is a high snowpack. Peak flooding typically occurs from late April through late May and ends before fish trapping begins in mid-June (Stone pers. comm. 2015e).

### Hazardous Materials

There are currently no hazardous materials used or stored at this location. Soil and groundwater at the site are not known to be contaminated with hazardous materials.

### Energy

Idaho Power provides power to the site via overhead power lines; however, there are currently no operational facilities at this site and no energy is currently in use (Stone pers. comm. 2015h).

## 3.14.2 Environmental Consequences

### Infrastructure and Environmental Hazards

Existing health and safety concerns associated with construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites include typical injuries that could occur while operating construction vehicles and equipment. Health and safety concerns associated with operation at the Crystal Springs hatchery site would be the same as at similar hatcheries. Operations at the Yankee Fork and Panther Creek weir facilities would have safety risks related to working in and near water. Impacts on public health and safety resources (i.e., public services) are analyzed in Section 3.10, *Socioeconomics and Environmental Justice*.

### Hazardous Materials

Construction activities at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites would require the use of diesel fuel, paints and solvents, and cement and asphalt.

Hatchery workers could be exposed to various chemicals that would be used at the Crystal Springs hatchery site during normal hatchery operations, including disinfecting and cleaning agents, as well as chemical therapeutants.[2] Tribal staff would also use and store formalin and small amounts of gasoline when trapping fish at the Yankee Fork and Panther Creek weir facilities. The use of chemicals for hatchery operations is regulated under the U.S. Environmental Protection Agency's *Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category* (Federal Register Volume 69, Number 162).

### Energy

#### Electricity

Minimal electricity would be temporarily used for powering small tools during construction at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites (Reiser pers. comm. 2015d).

[2] Chemical therapeutants are agents used during fish rearing to inhibit fungal growth on the eggs, sedatives used in sampling and tagging procedures, and antibiotics used in medicated feed.

#### Diesel

Construction of the hatchery, hatchery residences, and two weir facilities would use diesel as the energy source. Construction activities would consume approximately 66,000 gallons of diesel fuel for off-road construction equipment and haul trucks (Reiser pers. comm. 2015d).

## 3.14.2.2 Alternative 1: Hatchery Program with Permanent Weirs

### Crystal Springs Hatchery Site

#### Construction

Construction activities at the Crystal Springs hatchery site would be temporary and should be completed within 14 to 18 months. Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with hatchery construction are described below.

***Infrastructure and Environmental Hazards***

Safety concerns associated with constructing the proposed hatchery may include injuries related to operating construction vehicles and equipment. Minimizing safety risks to on-site construction personnel would be accomplished by selecting appropriately qualified construction workers, complying with federal and state safety standards, and implementing best management practices (BMPs). Federal and state safety standards include workplace health and safety rules and regulations that fall under Occupational Safety and Health Act (OSHA) (OSHA 2015). BMPs are identified under Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery.

Potential emergencies during construction could include construction accidents or fires. Notification of the need for emergency services at the site would occur by contacting local law enforcement via a 911 call. Exposure of the general public to construction-related safety risks would be minimized by restricting public access to the construction areas.

Construction activities would not alter or modify the existing earth embankment, and therefore would not increase the potential risk of environmental hazards, such as landslides or slope failures.

In summary, construction impacts on public health and safety associated with infrastructure and environmental hazards would be considered **low** with the implementation of mitigation measures described under Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery.

***Hazardous Materials***

Construction activities would require the use of diesel fuel, paints and solvents, and cement and asphalt. It would be possible for diesel and other hazardous materials to spill during construction of the proposed hatchery. Measures identified in a spill control containment and countermeasures (SPCC) plan, which includes spill cleanup response procedures, would be implemented to reduce the potential impacts of a spill incident (see Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery). Implementing these measures would ensure that impacts on public health and safety would be **low**.

***Energy***

Small amounts of electricity would be used during construction activities to power small tools. Electricity would be supplied by Idaho Power through the existing power lines. The amount of electricity needed to supply small power tools would be temporary and is anticipated to be a small fraction of the total amount of electricity provided by Idaho Power to its customers and should not affect the local availability of electricity. Impacts on electricity would be **low**.

Diesel fuel would be used throughout the duration of construction activities to operate construction equipment and haul trucks. The amount of fuel needed to supply construction equipment would be temporary and is anticipated to be small fraction of the total amount of fuel sold in Idaho and should not affect fuel supplies. Impacts on fuel supplies would be **low**.

### Operations

#### *Infrastructure and Environmental Hazards*

Operations at the proposed hatchery would be the same as at similar hatcheries. The potential risks associated with health and safety hazards that hatchery workers are exposed to include large amounts of electricity in an area with numerous pipes and constant running water, increasing the risk of electrocution. Additional potential hazards include those associated with water impoundments, nighttime work, and working around fish. Working near water poses potential risks of drowning and slipping. Nighttime work poses potential risks as a consequence of impaired vision due to reduced lighting, fatigue, and human error, and awareness of coworkers and surroundings. Working around fish poses potential risks including working with wet surfaces, cold temperatures, and potential for cuts and abrasions from fish teeth or spines that could lead to infection. Hatchery employees could also be exposed to potential risks such as mechanical hazards, bacterial and parasitic infections, and poor ergonomic practices (Meyers 2008).

Minimizing safety risks to hatchery workers would be accomplished by hiring appropriately qualified workers and complying with federal and state safety standards (see Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery). Federal and state safety standards include workplace health and safety rules and regulations that fall under OSHA (OSHA 2015). Implementing these standards would ensure that impacts on public health and safety would be minimal. Notification of the need for emergency services at the site would occur by contacting local law enforcement via a 911 call.

In summary, operational impacts on public health and safety as a result of infrastructure and environmental hazards would be considered **low** with the implementation of mitigation measures described under Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery.

#### *Hazardous Materials*

The proposed hatchery building would have a storage room (8 feet by 16 feet) located on the west side of the building used specifically for storing formalin. The room would be accessible from the outdoors via double doors to allow transfer of formalin from a truck into the storage room. The room would be constructed from concrete masonry unit block walls, a concrete floor slab, and sheetrock ceiling. Ventilation for the storage room would comply with state code requirements for the storage and ventilation of hazardous materials. The room would have the capacity to store up to three formalin storage barrels that would be placed on a spill containment pallet. A chemical meter pump system would pump formalin directly from a barrel to the incubation room. The formalin piping is routed to allow draining and full ventilation, and is designed to deliver formalin to each incubation stack in the incubation room (Reiser pers. comm. 2015e).

Daily operation of the hatchery would use chemicals for disinfecting and cleaning, as well as medicating and sterilizing fish. Disinfecting and cleaning agents that would be used include the following (Shoshone-Bannock Tribes 2015):

- Iodine Compounds: Approximately 16 gallons would be stored on site.
- Chlorine Compounds: Approximately 200 pounds (lbs) would be stored on site.
- Virkon Aquatic: Approximately 100 lbs would be stored on site.
- Sodium Thioulfate: Approximately 400 lbs would be stored on site.

Chemical therapeutants are agents used during fish rearing to inhibit fungal growth on the eggs, sedatives used in sampling and tagging procedures, and antibiotics used in medicated feed. Chemical therapeutants that would be used include the following (Shoshone-Bannock Tribes 2015):

- Oxytetracycline: Up to 4,675 lbs per year would be used on site in the form of medicated feed; however, under normal conditions, none would be stored on site.
- Erythromycin: Up to 4,200 lbs per year would be used on site in the form of medicated feed; however, under normal conditions, none would be stored on site.
- Florfenicol: Up to 2,500 lbs per year would be used on site; however, under normal conditions, none would be stored on site.
- Tricaine Methanesulfonate (MS 222): Approximately 2.2 lbs would be stored on site.
- Formalin: Three 55-gallon drums would be stored on site.

Storage of the chemicals listed above would entail obtaining annual updated Material Safety Data Sheets from the manufacturer for each chemical, and storing and handling the chemicals as stated on the Material Safety Data Sheets. Hatchery personnel would also closely follow the chemical handling and storage protocols identified in the *Crystal Springs Hatchery Fish Culture Procedures Manua*l (Shoshone-Bannock Tribes 2015). Specific handling and storage protocols for these chemicals include proper labeling; storage in a separate chemical storage area; security, including locks and restricted access; and proper training of staff for safety, handling, and spill cleanup response (see Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery).

Fuels would also be stored on site, including fuel for a generator that would be stored in an aboveground storage tank, and gasoline for small tools and equipment that would be stored in the shop building. Implementing proper safety standards and storage requirements for these fuels, similar to the BMPs described under Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery, would ensure that spills are contained and impacts on public health and safety related to fuel used and stored on site would be minimal.

Because specific chemical handling and storage protocols identified in the *Crystal Springs Hatchery Fish Culture Procedures Manual* would be followed (see Section 3.14.3, *Mitigation*, for the Crystal Springs hatchery), operational impacts on public health and safety associated with the use of hazardous materials at the proposed hatchery would be **low**.

***Energy***

The new hatchery would require an average of 1,169 megawatt hours of electricity per year, which would be supplied by Idaho Power (Reiser pers. comm. 2015d; Dize pers. comm.). The electricity required to run the facility is a small fraction of the 17.3 million megawatt hours of electricity sold in

Idaho in 2014 (Idaho Power 2015). The amount of electricity needed to supply the proposed hatchery would be minimal and should not affect the local availability of electricity, which would be a **low** impact.

Operating the Crystal Springs hatchery site would use an average of 6,300 gallons per year of diesel fuel for on-road vehicles (Reiser pers. comm. 2015d). Hatchery operations would also use, and store on site, fuels needed to power a generator and gasoline needed to power small tools and equipment. The amount of fuel needed to use hatchery vehicles, a generator, and small tools and equipment is anticipated to be a small fraction of the total amount of fuel sold in Idaho (e.g., 415 million gallons were sold in 2013) (USEIA 2015) and should not affect fuel supplies, which would be a **low** impact.

The current hatchery design does not include renewable or alternative energy sources at the Crystal Springs hatchery site; however, the Tribes will be exploring opportunities to include alternative sources of energy in the future.

## Yankee Fork Weir Facility

### Construction

Construction activities at the Yankee Fork weir facility would be temporary and would be completed within four months. Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with facility construction are described below.

#### *Infrastructure and Environmental Hazards*

Safety concerns associated with constructing the proposed weir structure may include injuries related to operating construction vehicles and equipment. Minimizing safety risks to on-site construction personnel would be accomplished by selecting appropriately qualified construction workers, complying with federal and state safety standards, and implementing BMPs. BMPs are identified below under Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility.

Potential emergencies during construction could include construction accidents, drowning, or fires. Notification of the need for emergency services at the site would occur by contacting local law enforcement via a 911 call. Exposing the general public to construction-related safety risks would be minimized by restricting public access to the construction areas.

Construction activities would not alter or modify the existing earth embankment, and therefore would not increase the potential risk of environmental hazards, such as landslides or slope failures.

In summary, construction impacts on public health and safety associated with infrastructure and environmental hazards at the Yankee Fork weir facility would be considered **low** with the implementation of mitigation measures described under Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility.

#### *Hazardous Materials*

Construction activities would require the use of diesel fuel, paints and solvents, and cement and asphalt. It would be possible for diesel and other hazardous materials to spill during construction of the proposed hatchery. Measures identified in an SPCC plan, which includes spill cleanup response procedures, would be implemented to reduce the potential impacts of a spill incident (see Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility). Implementing these measures would ensure that impacts on public health and safety would be **low**.

#### *Energy*

Small amounts of electricity would be used during construction activities to power small tools. Electricity would be supplied by the Salmon River Electric Cooperative through the existing power lines. The amount of electricity needed to supply small power tools would be temporary and is anticipated to be a small fraction of the amount of electricity that the Salmon River Electric Cooperative provides to its customers and should not affect the local availability of electricity. Impacts on electricity would be **low**.

Diesel fuel would be used throughout the duration of construction activities to operate construction equipment and haul trucks. The amount of fuel needed to supply construction equipment would be temporary and is anticipated to be small fraction of the total amount of fuel sold in Idaho and should not affect fuel supplies. Impacts on fuel supplies would be **low**.

### Operations

Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with Hatchery Program operations at the Yankee Fork weir facility under Alternative 1 are described below.

#### *Infrastructure and Environmental Hazards*

During normal operations under Alternative 1, the Tribes would trap adult Chinook salmon migrating upstream from June to mid-September using a permanent weir structure. Impacts on the workers during trapping operations would include working in and near water, including both the river and the adult holding ponds. Working in or near water poses the risk of falling, hypothermia, and drowning. As part of their trapping protocol, the Tribes would implement several strategies to minimize the risks associated with working near water (see Section 3.14,3, *Mitigation*, for the Yankee Fork weir facility*)*. Because the Tribes would implement strategies to minimize the risks associated with working near water, the impacts of public health and safety from the operations of weir infrastructure would be **low**.

Chain link fences and gates would be used to prevent public access to the permanent weir structure. Signage would also be provided to indicate a portage around the right abutment of the weir for watercraft floating the river. These measures would ensure that impacts on public health and safety would be **low**.

#### *Hazardous Materials*

A 10 feet by 24 feet by 9 feet prefabricated hazardous material storage building would be constructed just to the north of the fish holding ponds to contain formalin, which would be used as a disinfectant during operations. The chemical storage shed would have the ability to store formalin for the full operating season (eight 55-gallon barrels). The storage building would be constructed of the highest grade American-made steel and conform to National Fire Protection Association 30 standards for the wall structure. The roof system would meet or exceed UL 263 and ASTM-E119 standards, and the floor system would comply with NAAMM MBG 531 ("Metal Bar Grating Manual for Steel, Stainless Steel, and Aluminum Gratings and Stair Treads"). The storage shed would have the Warnock Hersey Approval with third party and/or state approvals available.

Formalin would be pumped from the storage barrels in the storage shed underground to the water supply in the post-sort holding ponds. Upon completion of each season, the storage containers would be removed and inspected prior to the next season. To minimize the risk of formalin spills and exposure, operations at the Yankee Fork weir facility would follow state and federal regulations for storage and containment of potentially hazardous chemicals (see Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility).

Fuels would also be stored on site, including diesel for a generator and small amounts of gasoline for small tools. Implementing proper safety standards and storage requirements at the Yankee Fork weir facility, similar to those described under Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility, would ensure that spills are contained and impacts on public health and safety related to fuel used and stored on site would be **low**.

Because state and federal regulations for storage and containment of potentially hazardous chemicals would be followed (see Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility), operational impacts on public health and safety associated with the use and storage of hazardous materials at the Yankee Fork weir facility would be **low**.

#### *Energy*

Electricity needed to operate the Yankee Fork weir facility under Alternative 1 is projected to use 42,700 kilowatt hours per year during normal operations (Reiser pers. comm. 2015d). The amount of electricity needed to supply the proposed permanent weir structure would be minimal and should not affect the local availability of electricity, which would be a **low** impact.

Operating the Yankee Fork weir facility would use an average of 10,000 gallons per year of diesel fuel for on-road vehicles (Reiser pers. comm. 2015d). The amount of fuel needed for vehicle use is anticipated to be a fraction of the total amount of fuel sold in Idaho (e.g., 415 million gallons were sold in 2013) (USEIA 2015) and should not affect fuel supplies, which would be a **low** impact.

The current facility design does not include renewable or alternative energy sources at the Yankee Fork weir facility; however, the Tribes will be exploring opportunities to include alternative sources of energy in the future.

## Panther Creek Weir Facility

### Construction

Construction activities at the Panther Creek weir facility would be temporary and should be completed within four months. Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with facility construction are described below.

#### *Infrastructure and Environmental Hazards*

Safety concerns associated with constructing the proposed weir structure may include injuries related to operating construction vehicles and equipment. Minimizing safety risks to on-site construction personnel would be accomplished by selecting appropriately qualified construction workers, complying with federal and state safety standards, and implementing BMPs. Federal and state safety standards include workplace health and safety rules and regulations that fall under OSHA (OSHA 2015). BMPs are identified under Section 3.14.3, *Mitigation*, for the Panther Creek weir facility.

Potential emergencies during construction could include construction accidents, drowning, or fires. Notification of the need for emergency services at the site would occur by contacting local law enforcement via a 911 call. Exposure of the general public to construction-related safety risks would be minimized by restricting public access to the construction areas.

Construction activities would not alter or modify the existing earth embankment, and therefore would not increase the potential risk of environmental hazards, such as landslides or slope failures.

In summary, construction impacts on public health and safety associated with infrastructure and environmental hazards at the Panther Creek weir facility would be considered **low** with the implementation of mitigation measures described under Section 3.14.3, *Mitigation*, for the Panther Creek weir facility.

#### *Hazardous Materials*

Similar to the Yankee Fork weir facility, construction activities at the Panther Creek weir facility would require the use of diesel fuel, paints and solvents, and cement and asphalt. It would be possible for diesel and other hazardous materials to spill during construction of the proposed hatchery. Measures identified in an SPCC plan, which includes spill cleanup response procedures, would be implemented to reduce the potential impacts of a spill incident (see Section 3.14.3, *Mitigation*, for the Panther Creek weir facility). Implementing these measures would ensure that impacts on public health and safety would be **low**.

#### *Energy*

Similar to the Yankee Fork weir facility, small amounts of electricity would be used during construction activities to power small tools at the Panther Creek weir facility. Electricity would be supplied by Idaho Power through the existing power lines. The amount of electricity needed to supply small power tools would be temporary and is anticipated to be a small fraction of the amount of electricity that Idaho Power provides to its customers and should not affect the local availability of electricity. Impacts on electricity would be **low**.

Diesel fuel would be used throughout the duration of construction activities to operate construction equipment and haul trucks. The amount of fuel needed to supply construction equipment would be temporary and is anticipated to be small fraction of the total amount of fuel sold in Idaho and should not affect fuel supplies. Impacts on fuel supplies would be **low**.

### Operations

Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with Hatchery Program operations at the Panther Creek weir facility under Alternative 1 are described below.

#### *Infrastructure and Environmental Hazards*

During normal operations under Alternative 1, the Tribes would trap adult Chinook salmon migrating upstream from June to mid-September using a permanent weir structure. Impacts on the workers during trapping operations would include working in and near water, including both the river and the adult holding ponds. Working in or near water poses the risk of falling, hypothermia, and drowning. As part of their trapping protocol, the Tribes would implement several strategies to minimize the risks associated with working near water (see Section 3.14.3, *Mitigation*, for the Panther Creek weir facility*)*. Chain link fences and gates would be used to prevent public access to the permanent weir structure.

As mentioned under *Affected Environment, Infrastructure and Environmental Hazards* for the Panther Creek weir facility (Section 3.14.1.4, *Panther Creek Weir Facility*), Panther Creek can flood above its banks during spring run-off when there is a high snowpack. Flooding typically occurs from late April through late May; however, even if the facilities at Panther Creek are partially flooded in the spring, trapping operations for Chinook salmon do not begin until June, which is after spring flooding has cleared the basin and the river is approaching normal flows. Therefore, trapping operations should not be affected by spring floods.

Because the Tribes would implement strategies to minimize the risks associated with working in and near water, and trapping operations would be conducted during time periods when flooding was not a risk, the impacts of public health and safety from the operations of weir infrastructure would be **low**.

#### *Hazardous Materials*

Similar to the Yankee Fork weir facility, a 10 feet by 24 feet by 9 feet prefabricated hazardous material storage building would be constructed just to the north of the fish holding ponds to contain formalin, which would be used as a disinfectant during operations at the Panther Creek weir facility. The chemical storage shed would have the ability to store formalin for the full operating season (eight 55-gallon barrels). The storage building would be constructed of the highest grade American-made steel and conform to National Fire Protection Association 30 standards for the wall structure. The roof system would meet or exceed UL 263 and ASTM-E119 standards, and the floor system would comply with NAAMM MBG 531 (“Metal Bar Grating Manual for Steel, Stainless Steel, and Aluminum Gratings and Stair Treads”). The storage shed would have the Warnock Hersey Approval with third party and/or state approvals available.

Formalin would be pumped from the storage barrels in the storage shed underground to the water supply in the post-sort holding ponds. Upon completion of each season, the storage containers would be removed and inspected prior to the next season. To minimize the risk of formalin spills and exposure, operations at the Panther Creek weir facility would follow state and federal regulations for storage and containment of potentially hazardous chemicals (see Section 3.14.3, *Mitigation*, for the Panther Creek weir facility).

Fuels would also be stored on site, including diesel for a generator and small amounts of gasoline for small tools. Implementing proper safety standards and storage requirements at the Panther Creek weir facility, similar to those described under Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility, would ensure that spills are contained and impacts on public health and safety related to fuel used and stored on site would be **low**.

Because state and federal regulations for storage and containment of potentially hazardous chemicals would be followed (see Section 3.14.3, *Mitigation*, for the Panther Creek weir facility), operational impacts on public health and safety associated with the use and storage of hazardous materials at the Panther Creek weir facility would be **low**.

#### *Energy*

Electricity needed to operate the Panther Creek weir facility under Alternative 1 is projected to use 42,700 kilowatt hours per year during normal operations (Reiser pers. comm. 2015d). The electricity required to run the facility is a small fraction of the 17.3 million megawatt hours of electricity sold in Idaho in 2014 (Idaho Power 2015). The amount of electricity needed to supply the proposed permanent weir structure would be minimal and should not affect the local availability of electricity, which would be a **low** impact.

Operating the Panther Creek weir facility would use an average of 10,000 gallons per year of diesel fuel for on-road vehicles (Reiser pers. comm. 2015d). The amount of fuel needed for vehicle use is anticipated to be a fraction of the total amount of fuel sold in Idaho (e.g., 415 million gallons were sold in 2013) (USEIA 2015) and should not affect fuel supplies, which would be a **low** impact.

The current facility design does not include renewable or alternative energy sources at the Panther Creek weir facility; however, the Tribes will be exploring opportunities to include alternative sources of energy in the future.

## 50% Production of Chinook Salmon Option

### Crystal Springs Hatchery Site

The Crystal Springs hatchery facilities proposed to be constructed under the 50% production of Chinook salmon option are the same facilities that are proposed to be constructed for full production under Alternative 1. (See Chapter 2, *Alternatives, Including the Proposed Action*, for a detailed explanation of the 50% production of Chinook salmon option.) Similar to full production, public health and safety impacts associated with construction of the hatchery facilities under the reduced production option would include safety concerns operating construction equipment and the possibility of hazardous materials spills. These impacts would be **low**.

Although production of Chinook salmon would be reduced by 50%, the operational impacts on public health and safety would be essentially the same as that described for full production under Alternative 1. Impacts would include safety concerns working near water and ensuring the safe storage of potentially hazardous chemicals (the application rate of formalin and other chemicals used for the reduced production option would be the same to ensure the appropriate concentration is used). Similar to full production, public health and safety impacts related to hatchery operations would be **low**.

### Yankee Fork and Panther Creek Weir Facilities

Permanent weir facilities proposed to be constructed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 1. Similar to full production, public health and safety impacts associated with construction of the permanent weir facilities under the reduced production option would include safety concerns operating construction equipment and the possibility of hazardous materials spills. These impacts would be **low**.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek permanent weir facilities would be the same under the reduced production option as for full production under Alternative 1. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Impacts would include safety concerns working near water and ensuring the safe storage of potentially hazardous chemicals. Public health and safety impacts related to operating the weir facilities would be **low**.

### 3.14.2.3 Alternative 2: Hatchery Program with Temporary Weirs

#### Crystal Springs Hatchery Site

Under Alternative 2, construction and operational impacts associated with public health and safety at the Crystal Springs hatchery would be the same as described under Alternative 1.

#### Yankee Fork Weir Facility

**Construction**

Alternative 2 would have **low** construction impacts associated with the Yankee Fork weir or associated facilities. Under Alternative 2, the Tribes would install a temporary weir to collect fish, which would be installed and removed by hand; no equipment would be used to construct the temporary weir at the Yankee Fork site. (See *Operations* below for a description of public health and safety impacts related to installing a temporary weir facility.) As a result, there would be no construction-related impacts associated with infrastructure and environmental hazards, hazardous materials, and energy use on public health and safety.

**Operations**

Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with Hatchery Program operations at the Yankee Fork weir facility under Alternative 2 are described below.

***Infrastructure and Environmental Hazards***

During normal operations under Alternative 2, the Tribes would capture adult Chinook salmon from approximately June through mid-September as the fish are returning upstream in Yankee Fork. Fish would be collected using temporary weir and trap structures seasonally installed and removed at the Pole Flat Campground. The temporary structures would be installed by hand. Components of the temporary facilities at Yankee Fork would include a temporary picket weir, a temporary adult trap attached to the picket weir, and juvenile acclimation ponds. The existing East Fork Salmon River facility, located approximately 18 miles upstream of the confluence of the East Fork Salmon with the mainstem Salmon River, would serve as an adult holding area for Yankee Fork Chinook salmon. Under this alternative, there would be no adult holding facilities at the Yankee Fork site.

A variety of hazards and risks are associated with installation or removal of a temporary weir. This work requires dozens of trips across the river in swift, cold water with approximately 50 pound loads. Work is typically performed by five technicians and one biologist. Technicians first install the panels, then a narrow wooden walkway, and finally the trap box. During the installation and early operation period, technicians take several trips across the weir each day to remove debris that could damage the weir. Installation typically occurs at a time of year when hypothermia is not a substantial concern, but the water temperatures are low enough that such a risk exists if there are complicating factors (such as an injury). Because a temporary weir is more susceptible to damage from extreme weather events, which have the potential to raise the level of the river by more than one foot in a matter of hours, a significant rebuild may be needed if such an event occurs. Thus, the hazardous work of temporary weir installation or removal may have to be repeated multiple times over the course of the working season. Installation or removal of the temporary weir also requires at least one technician be present on the roadway to alert drivers to the presence of materials along the roadside during installation.

Impacts on workers during trapping operations would include working in and near a river, which poses the risk of falling, hypothermia, and drowning. As part of their trapping protocol, the Tribes would implement several strategies to minimize the risks associated with working in and near a river (see Section 3.14.3, *Mitigation*, for the Yankee Fork weir facility). Impacts associated with infrastructure and environmental hazards would be **moderate**.

#### *Hazardous Materials*

No adult holding facilities would be used at the Yankee Fork weir facility under Alternative 2; however, fish collected as broodstock would typically be anesthetized prior to transportation. As a result, small amounts of a fish anesthetic would be used at the site. Impacts on public health and safety associated with hazardous materials would be **low**.

#### *Energy*

The use of electricity would not be needed while operating the Yankee Fork weir facility under Alternative 2; therefore, there would be **no** impacts on the local availability of electricity. To provide power at the site, the Yankee Fork weir facility would use a generator powered from two 5-gallon propane tanks that would be filled once a week to sustain seasonal operations from mid-June through early September.

During normal operations, Alternative 2 would require staff to travel to and from the site daily. Additionally, once every other day, small pickup trucks would need to travel between Yankee Fork and the East Fork Salmon River facility to deliver fish materials (Stone pers. comm. 2015h). Employees commuting to and from the site, as well as small truck trips between Yankee Fork and the East Fork Salmon River facility, would require the use of diesel and gasoline to fuel vehicles. The amount of fuel needed for vehicle use, however, is anticipated to be a small fraction of the total amount of fuel sold in Idaho (e.g., 415 million gallons were sold in 2013) (USEIA 2015) and should not affect fuel supplies. Impacts on fuel supplies would be **low**.

## Panther Creek Weir Facility

### Construction

Alternative 2 would have **low** construction impacts associated with the Panther Creek weir or associated facilities. Under Alternative 2, the Tribes would install a temporary weir to collect fish, which would be installed and removed by hand; no equipment would be used to construct the temporary weir at the Panther Creek site. (See *Operations* below for a description of public health and safety impacts related to installing a temporary weir facility.) As a result, there would be **no** construction-related impacts associated with infrastructure and environmental hazards, hazardous materials, and energy use on public health and safety. No mitigation is proposed.

### Operations

Infrastructure and environmental hazards, hazardous materials, and energy-use impacts associated with Hatchery Program operations at the Panther Creek weir facility under Alternative 2 are described below.

### *Infrastructure and Environmental Hazards*

During normal operations under Alternative 2, the Tribes would capture adult Chinook salmon from approximately June through mid-September as the fish are returning upstream in Panther Creek. Fish would be collected using temporary weir and trap structures seasonally installed and removed at a temporary campsite at the Cobalt Work Center during the field season. The temporary structures would be installed by hand. Components of the temporary facilities at Panther Creek would include a temporary picket weir, a temporary adult trap attached to the picket weir, and temporary juvenile acclimation facility. The existing East Fork Salmon River facility, located approximately 18 miles upstream of the confluence of the East Fork Salmon with the mainstem Salmon River, would serve as an adult holding area for Panther Creek Chinook salmon. Under this alternative, there would be no adult holding facilities at the Panther Creek site.

Similar to the Yankee Fork weir facility, a variety of hazards and risks are associated with installation or removal of a temporary weir. This work requires dozens of trips across the river in swift, cold water with approximately 50 pound loads. Work is typically performed by five technicians and one biologist. Technicians first install the panels, then a narrow wooden walkway, and finally the trap box. During the installation and early operation period, technicians take several trips across the weir each day to remove debris that could damage the weir. Installation typically occurs at a time of year when hypothermia is not a substantial concern, but the water temperatures are low enough that such a risk exists if there are complicating factors (such as an injury). Because a temporary weir is more susceptible to damage from extreme weather events, which have the potential to raise the level of the river by more than one foot in a matter of hours, a significant rebuilt may be needed if such an event occurs. Thus, the hazardous work of temporary weir installation or removal may have to be repeated multiple times over the course of the working season. Installation or removal of the temporary weir also requires at least one technician be present on the roadway to alert drivers to the presence of materials along the roadside during installation.

Impacts on workers during trapping operations would include working in and near a river, which poses the risk of falling, hypothermia, and drowning. As part of their trapping protocol, the Tribes would implement several strategies to minimize the risks associated with working in and near a river (see Section 3.14.3, *Mitigation*, for the Panther Creek weir facility*)*. Impacts associated with infrastructure and environmental hazards would be **moderate**.

### *Hazardous Materials*

No adult holding facilities would be used at the Panther Creek weir facility under Alternative 2; however, fish collected as broodstock would typically be anesthetized prior to transportation. As a result, small amounts of a fish anesthetic would be used at the site. Impacts on public health and safety associated with hazardous materials would be **low**.

### *Energy*

The use of electricity would not be needed while operating the Panther Creek weir facility under Alternative 2; therefore, there would be **no** impacts on the local availability of electricity. To provide power at the site, the Panther Creek weir facility would use a generator powered from two 5-gallon propane tanks that would be filled once a week to sustain seasonal operations from mid-June through early September.

During normal operations, Alternative 2 would require staff to travel to and from the site daily. Additionally, once every other day, small pickup trucks would need to travel between Panther Creek and the East Fork Salmon River facility to deliver fish materials (Stone pers. comm. 2015h). Employees commuting to and from the site, as well as small truck trips between Panther Creek and the East Fork Salmon River facility, would require the use of diesel and gasoline to fuel vehicles. The amount of fuel needed for vehicle use, however, is anticipated to be a small fraction of the total amount of fuel sold in Idaho (e.g., 415 million gallons were sold in 2013) (USEIA 2015) and should not affect fuel supplies. Impacts on fuel supplies would be **low**.

### 50% Production of Chinook Salmon Option

#### Crystal Springs Hatchery Site

Impacts related to construction and operation of the Crystal Springs hatchery under the 50% production of Chinook salmon option for Alternative 2 would be the same as those impacts described for the 50% production option under Alternative 1. These impacts would be **low**.

#### Yankee Fork and Panther Creek Weir Facilities

Temporary weir facilities proposed to be installed at the Yankee Fork and Panther Creek sites under the 50% production of Chinook salmon option are the same facilities that are proposed for full production under Alternative 2. The temporary weir facilities would be installed and removed seasonally by hand; no equipment would be used to construct the temporary weirs at the Yankee Fork and Panther Creek sites. As a result, there would be **no** construction-related impacts associated with infrastructure and environmental hazards, hazardous materials, and energy use on public health and safety.

Although approximately half as many Chinook salmon would be collected at the weir sites under the 50% production option, operation of the Yankee Fork and Panther Creek temporary weir facilities would be the same under the reduced production option as for full production under Alternative 2. As described in Chapter 2, the Tribes would still need to have the weir facilities fully staffed and operated for the same period of time when trapping fish at the weir sites. (The full duration of trapping fish is needed to ensure the genetic makeup of the broodstock is representative of the genetic makeup of the natural-production fish population.) Impacts would include possible hazards working in and near a river as the temporary weir facilities are installed by hand. Similar to full production, these impacts would be **moderate**. In addition, small amounts of a fish anesthetic would be used at the site, and fuel would be needed for commuting and truck trips. These public health and safety impacts related to temporary weir facility operations would be **low**.

## 3.14.3 Mitigation

The Tribes would implement the following mitigation measures to avoid or minimize impacts on public health and safety during construction and operation of Alternatives 1 and 2 at the Crystal Springs hatchery, Yankee Fork, and Panther Creek sites.

### 3.14.3.1 Alternative 1

#### Construction

To minimize safety risks on workers and the public during construction of the Crystal Springs hatchery and the Yankee Fork and Panther Creek permanent weir facilities, the construction contractor would implement the following BMPs:

- Select appropriately qualified construction workers.
- Hold safety meetings with construction workers at the start of each work week to review potential safety issues and concerns.
- Ensure that construction workers comply with federal and state safety standards (OSHA 2015).
- Attend monthly meetings with BPA and Tribal staff to discuss safety issues.
- Restrict public access to active construction areas; exclude all unauthorized personnel from entry.

Construction activities at the Crystal Springs hatchery site would also require the use of diesel fuel, paints and solvents, and cement and asphalt. To avoid, minimize, or offset the risk of accidental spills, and ensure that any risk to public health and safety would be minimal, the construction contractor would implement the following measures:

- Obtain a National Pollutant Discharge Elimination System (NPDES) permit for construction activities prior to any ground-disturbing activities (see Section 3.5, *Groundwater and Surface Water Quality and Quantity*).
- Implement a stormwater pollution prevention plan (SWPPP), which includes implementing a SPCC plan; both the SWPPP and the SPCC plan are required under the NPDES Permit.
- Prepare a Safety Plan in compliance with state requirements before starting construction. Specify how to manage hazardous materials, such as fuel and any hazardous 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 it as needed.

#### Operations

##### Crystal Springs Hatchery Site

To minimize safety risks on Crystal Springs hatchery workers, the Tribes would implement the following BMPs:

- Hire appropriately qualified hatchery workers.
- Train staff in the proper use, transport, handling, and storage of all chemicals to minimize dangers of overexposure or accidental release to the environment.
- Ensure that hatchery workers comply with state and federal safety standards (OSHA 2015).
- Provide appropriate safety equipment.
- Store chemicals in areas designed to contain chemicals in the event of a leak or accidental spill.

During normal hatchery operations, chemicals and hazardous materials would be stored at the Crystal Springs hatchery in accordance with applicable state and federal regulations, and as described in Chapter 9, *Chemical Handling Protocols*, from the draft *Crystal Springs Hatchery Fish Culture Procedures Manual* (Shoshone-Bannock Tribes 2015). Implementing the measures listed below—which include proper labeling, storage in a separate chemical storage area, security, and proper training of staff for safety, handling, and spill cleanup response—would reduce the risk of accidental spills, resulting in minimal potential impact on public health and safety.

***Labeling***

- Label all containers. Include chemical name, formula, expiration date, storage requirements, and primary hazards.
- Ensure labels are colorfast and permanent.
- Replace labels if they become damaged or faded.

***Storage***

- Keep containers closed with threaded caps when not in use.
- Segregate incompatible chemicals by storing acids, bases, and flammable liquids in separate cabinets, and separating oxidizers, pure metals, and reactives from other compounds on shelves.
- Consult chemical supplier for suggested systems for chemical storage.
- Store chemicals so that labels are visible.
- Ensure chemicals are stored in appropriate storage cabinets.
- Store flammable liquids in certified flammable storage cabinets and acids in corrosion-resistant nonmetal cabinets.
- Store volatile chemicals requiring refrigeration in explosion-proof refrigerators. A spark from the thermostat or light switch in a traditional unit could be enough to set off volatile fumes from the chemical and cause an explosion.
- Store chemicals at or below eye level (but not on the floor).
- Never stack chemicals top of each other.
- Stock small quantities of chemicals. Small bottles are less likely to break than large ones.
- Monitor the integrity of shelves. For example, are the chemicals too heavy for the shelf? Is the shelf sagging? Do the shelves show signs of wear? Are support clips corroded?
- Use secondary containment for liquids in storage to contain spills. Ensure the materials in a secondary container are compatible with each other and with the containment tub.
- Anchor storage cabinets to walls and doors so that earthquakes or other hazards do not topple cabinets.
- Monitor chemical containers to ensure container integrity remains intact. Signs of wear may include bulging, cracks, leaks, or rust.
- Monitor container tops for cracks, especially on bottles of nitric acid. Replace if degraded.

***Chemical Storage Area***

- Acid fumes can eat away at metals. Note corrosion residue below metal shelf holders.
- Label all containers. Include chemical name, formula, expiration date, storage requirements, and primary hazards.
- Monitor caps and replace when worn to prevent evaporation, leaks, and spills.
- Monitor volumes of chemicals. If chemical reductions are noted, this could be a sign of evaporation or theft.
- Monitor the stored chemicals for crystal buildup or formation of a liquid above a solid. These could indicate a leaking cap or the formation of potentially unstable and dangerous by-products.
- If hazardous potential is unknown, contact a local hazardous waste management company (i.e., look in the phone book under *Environmental Services*) or the State Communications Center, at (800) 632-8000, for assistance.
- Monitor expiration dates on chemicals. Use chemicals on a first-in, first-out basis to prevent accumulation of expired materials.

***Security***

- Lock chemical cabinets or storage rooms to prevent theft.
- Restrict student access to chemical cabinets and storage rooms.
- Monitor chemical volumes. Unanticipated reductions in volume could be a sign of theft.
- Conduct routine inventories of chemicals and monitor wastes.
- Provide copies of updated chemical inventories to school management and the local fire station.

***Other***

- Ensure that staff is trained in the hazards of chemicals, spill cleanup response, and safety procedures.
- Have Material Safety Data Sheets on site for all chemicals.
- Purge unneeded, older chemicals yearly to prevent chemical stockpiles.

### Yankee Fork and Panther Creek Weir Facilities

Several safety risks are associated with the trapping of fish at the Yankee Fork and Panther Creek permanent weir facilities. To ensure worker safety, the Tribes would implement the following risk minimization strategies associated with trapping fish (Stone pers. comm. 2015h):

- Upon being hired, Tribal staff would attend a swift-water rescue course through Idaho State University to become aware of common self-rescue and assisted rescue techniques.
- Tribal staff would be equipped with dry suits when performing instream tasks. Personal flotation devices are not needed because the water levels in Yankee Fork and Panther Creek are relatively low; the primary concern is cold water exposure.

During normal operation of the Yankee Fork and Panther Creek weir facilities, potential hazardous chemicals such as formalin would be stored according to state and federal regulations as described in Section 3.14.2.2, *Alternative 1: Hatchery Program with Permanent Weirs*, for the Yankee Fork and

Panther Creek weir facilities. Additional measures to minimize spills and exposure to hazardous chemicals would be similar to those described above for the Crystal Springs hatchery. These measures would ensure potentially hazardous materials are properly stored and used in a manner that reduces the risk of accidental spills and exposure. These measures would also require a plan for a timely cleanup response should an accidental spill occur.

### 3.14.3.2 Alternative 2

#### Construction

For the Crystal Springs hatchery, implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery. No construction is proposed at the Yankee Fork and Panther Creek sites as the temporary weir facilities would be installed by hand; no mitigation would be recommended.

#### Operations

For the Crystal Springs hatchery site, implement the same mitigation recommended under Alternative 1 for the Crystal Springs hatchery. For the Yankee Fork and Panther Creek sites, implement the same mitigation recommended under Alternative 1 for the Yankee Fork and Panther Creek weir facilities.

## 3.14.4 No Action Alternative

Under the No Action Alternative, no new construction would take place at the proposed Crystal Springs hatchery site or on USFS land within the Panther Creek watershed. The sites would continue to not be used, no structures would be constructed, and no activities would occur.

Under the No Action Alternative, although ongoing actions at the temporary weir structure on Yankee Fork would continue to operate under the existing authorization, no new construction would take place at the site. In addition, current operations would only continue through 2016 and then cease, which would not cause additional health and safety risks to the public. Under the No Action Alternative, impacts on public health and safety would be **low**.

# 3.15 Adverse Effects that Cannot be Avoided and Irreversible and Irretrievable Commitments of Resources

Specific to the requirements of NEPA, Section 102, an EIS must include a discussion of "any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented" (40 CFR 1502.16). A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource. An irretrievable commitment of resources refers to the use or consumption of resources that is neither renewable nor recoverable for later use by future generations. The commitment of resources refers primarily to the use of nonrenewable resources such as fossil fuels, water, labor, and electricity.

An EIS must explain which environmental impacts are irreversible or would result in irretrievable commitments of resources. This is similar to identifying the unavoidable impacts of the Proposed Action and action alternatives, where no mitigation is available to offset certain environmental consequences. The EIS may also include a discussion of the Proposed Action's need to use nonrenewable resources, such as fossil fuels.

Nearly all resource use associated with construction of the proposed facilities would be irreversible. This includes building materials and energy expenditures associated with facility construction at the Crystal Springs hatchery, Yankee Fork weir facility, and Panther Creek weir facility. The only exception is that some electricity use during construction at the Crystal Springs hatchery site would be from renewable sources, primarily hydroelectric power generated by or purchased from Idaho Power. Also, upon the eventual demolition of the proposed facilities that would occur at the end of their useful life or—in the case of the Yankee Fork and Panther Creek weir facilities—upon the expiration of their Special Use Permits, it is likely that some building materials such as metals could be recycled, or that pieces of equipment could be reused.

All operational use of materials and energy at the proposed facilities would be irreversible, with the exception of that portion of electricity use at the Crystal Springs hatchery site derived from hydroelectric sources. Materials and energy use would primarily consist of aquaculture treatment chemicals at all facilities; fish feed at the Crystal Springs hatchery; and diesel or gasoline use to generate electricity at the Yankee Fork and Panther Creek weir facilities and to transport fish and supplies by truck between the various facilities.

No additional irreversible or irretrievable resource commitments are identified. No mineral resources would be extracted, no historical or archeological sites would be lost, no wetlands would be filled, and no consumptive use of water resources is proposed. All facility sites would essentially return to their current (i.e., pre-project) condition upon eventual decommissioning or removal of the proposed facilities. No other unavoidable adverse effects have been identified.

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# 3.16 Short-Term Use of the Environment and Effects on Long-Term Productivity

Section 102(2)(c)(iv) of NEPA and 40 CFR 1502.16 require that an EIS include a discussion of the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. This section describes how the Proposed Action (Alternative 1, full production option) would affect the short-term use and the long-term productivity of the environment.

## 3.16.1 Short-Term Use and Long-Term Productivity Defined

In reference to the Proposed Action, "short-term" refers to effects that would occur only during construction of the hatchery and weir facilities, and would cease at the conclusion of construction. "Long-term" refers to effects associated with either the construction or the operation of the facilities that would persist for the operational life of the Proposed Action and beyond.

The following sections evaluate the short-term use effects and long-term productivity effects that could result from the Proposed Action on various resource areas. When considering the effect of the action alternatives on long-term productivity, three types of long-term productivity are considered: land use productivity, water resources productivity, and biological resources productivity. The relationship between short-term uses and long-term productivity would not be appreciably different among the action alternatives.

## 3.16.2 Short-Term and Long-Term Construction-Related Effects

Short-term effects include impacts such as noise and activities associated with construction, construction-related impacts on traffic, and emissions from construction equipment. Long-term effects associated with construction include impacts such as vegetation clearing, groundwater use, and the placement of weir facilities in the stream channel at the Yankee Fork and Panther Creek sites.

## 3.16.3 Land Use Productivity

At the Crystal Springs hatchery site, the Proposed Action continues the historical use of the site as a fish hatchery. Use of the site in this capacity is likely to continue; therefore, the hatchery does not alter land use because historical use of the site would not change.

At the Yankee Fork and Panther Creek sites, land use would continue unaltered in the vicinity of the Proposed Action. In addition, the terms of the Special Use Permit that would be issued by the USFS to authorize the Proposed Action are expected to require complete demolition and removal of all built elements at the conclusion of the permit term (including any renewals). Therefore, no long-term change in land use would occur at the weir sites because once the permit term has expired, the land would be restored back to its original condition.

### 3.16.4 Water Resources and Biological Resources Productivity

A similar analysis applies to water resources productivity and biological resources productivity. At the hatchery site and both weir sites, the use of and impacts on water resources would be as described in Section 3.5, *Groundwater and Surface Water Quality and Quantity*. The use of water under the Proposed Action would be non-consumptive for the duration of program implementation and would cease at the end of hatchery operations, yielding a long-term neutral impact on water resources.

With regard to biological resources productivity, operational impacts of the hatchery and weir facilities on vegetation and wildlife are not significant. The purpose of the Proposed Action is to contribute to the recovery and increased long-term productivity of spring/summer-run Chinook salmon in the Salmon River Basin. This beneficial effect is expected to appear during implementation of the Proposed Action and continue indefinitely thereafter.

# 3.17 Cumulative Impacts

The Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act require the assessment of cumulative impacts in the decision-making process for major federal actions. Cumulative impacts are defined as the impact on the environment which results from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts could result from individually minor but collectively significant actions taking place over a period of time.

Potential impacts on the environment from the Crystal Springs Hatchery Program (Hatchery Program) were also considered in regard to their duration. Permanent impacts are those that would modify the environment to such a degree that it would not return to its preconstruction state for the life of the Hatchery Program (approximately 50 years). Temporary impacts are those that would result in short-term and disturbance and would not prevent the re-establishment of similar preconstruction conditions in the affected areas.

## 3.17.1 Spatial and Temporal Boundaries

Reasonable boundaries for the consideration of past, present, and reasonably foreseeable future actions were established based on where other actions are located (spatial boundaries) and when in time these actions took place or will take place (temporal boundaries).

For each environmental resource, the spatial boundary is the area where other past, present, and reasonably foreseeable future actions create cumulative impacts on the affected resource when combined with the impacts of the Hatchery Program. The Hatchery Program is assumed to have an effective life of 25 years, corresponding with the proposed special-use permit timeframe for the U.S. Forest Service (USFS) at Yankee Fork and Panther Creek. The Hatchery Program will be re-evaluated at that time to determine its efficacy and the need to continue operations.

Unless otherwise noted, the spatial boundary to analyze cumulative impacts related to the Crystal Springs hatchery site is Bingham County. Bonneville Power Administration (BPA) and the Shoshone-Bannock Tribes (Tribes) were consulted to identify reasonably foreseeable future projects in Bingham County. Because the Yankee Fork and Panther Creek sites are located on USFS land, the spatial boundary to analyze cumulative impacts related to these sites is the Salmon-Challis National Forest, unless otherwise noted. The USFS *Schedule of Proposed Actions for the Salmon-Challis National Forest* (USFS 2015b) was consulted to identify reasonably foreseeable future projects in the Salmon-Challis National Forest.

The temporal boundary describes how far into the past and forward into the future other actions should be considered in the cumulative impact analysis. For the purposes of this analysis, past and present actions have shaped the landscape since the first European settlement (early 1830s) in the general vicinity (Fort Hall, 2 miles southeast of Crystal Springs hatchery). The reasonably foreseeable nature of potential future actions helps define the forward-looking temporal boundary. While the Proposed Action could exist for more than 50 years and could contribute to cumulative impacts during that timeframe, it would be speculative to consider actions beyond what is reasonably foreseeable. Given this limitation, the forward-looking temporal boundary has been established generally at about 10 years following the expected completion of construction of the Proposed Action. This 10-year period is an applicable timeframe by which reasonably foreseeable future actions identified in Table 3.17-1 would likely be implemented. Resources within the temporal boundary were considered to be either temporarily or permanently impacted by construction and operation, depending upon the proposed activity.

## 3.17.2 Past, Present, and Reasonably Foreseeable Future Actions

Past and present actions relevant to the cumulative impact analysis in this EIS are referenced in the introduction to Chapter 3, *Affected Environment and Environmental Consequences*, of this Draft EIS, and are accounted for in the impacts analyses described in Sections 3.1 through 3.16. Table 3.17-1 summarizes past, present, and reasonably foreseeable actions that could be taken in the Salmon River basin that could incrementally add to impacts created by the Hatchery Program. Impacts from proposed facility operations were identified by examining how routine operational procedures could affect resources located both on and off the site. Such impacts were qualitatively described, including the impact mechanism, potential effects, duration (i.e., temporary or permanent), and likelihood of occurrence in light of the proposed operations' mitigation measures.

**Table 3.17-1. Past, Present, and Reasonably Forseeable Future Projects in the Salmon River Basin**

| Project Type | Project/Activities and Sponsor | Resource Affected |
|---|---|---|
| Past | Mining operations in the Blackbird Creek drainage – Private entities | Water quality, fish, wildlife |
| Past | Wild and Scenic Rivers eligibility determination for Yankee Fork and Panther Creek – U.S. Forest Service (USFS 1989) | Recreation, geology, water quality and quantity, fish, cultural resources, visual quality |
| Past, present, and future | Agricultural practices, including irrigation – Private entities | Water quality and quantity, fish, wildlife |
| Past, present, and future | Recreational use of Yankee Fork and Panther Creek (kayaking, fishing, camping) – Private entities | Recreation, fish, wildlife, visual quality |
| Past, present, and future | Fort Hall habitat restoration project – Shoshone-Bannock Tribes | Fish, wildlife |
| Past, present, and future | Salmon River habitat restoration project – Shoshone-Bannock Tribes | Fish, wildlife |
| Past, present, and future | Operation of rotary screw trap and passive integrated transponder (PIT) arrays to monitor fish populations | Fish |
| Past, present, and future | Sawtooth Fish Hatchery – Idaho Department of Fish and Game | Fish, water quality and quantity |
| Past, present, and future | Pahsimeroi Fish Hatchery – Idaho Power | Fish, water quality and quantity |
| Past, present, and future | Snake River Steelhead Program – Idaho Department of Fish and Game | Fish, water quality and quantity |

| Project Type | Project/Activities and Sponsor | Resource Affected |
|---|---|---|
| Past, present, and future | Squaw Creek weir – Idaho Department of Fish and Game | Fish, water quality and quantity |
| Past, present, and future | Lower Snake River Compensation Plan | Fish |
| Present and future | Springfield Fish Hatchery – Idaho Department of Fish and Game | Water quality and quantity |
| Future | Panther Creek rotary screw trap and passive integrated transponder tag array – Shoshone-Bannock Tribes | Fish |
| Future | Idaho Cobalt Project - Private | Fish, water quality and quantity |
| Future | Yankee Fork Restoration project – Shoshone-Bannock Tribes | Recreation, water quality, fish, wildlife |
| Future | Use of Yankee Fork weir facilities to support the Lower Snake River Compensation Plan steelhead program under Idaho Department of Fish and Game | Fish |

Many plans; federal, state, and county regulations; and laws are in place to reduce effects of land use activities and to restore habitat. However, it is unclear if these plans, regulations, and laws will be successful in meeting their environmental goals and objectives. Additionally, it is not possible to predict the magnitude of effects from future development and habitat restoration with certainty for several reasons: (1) the activities may not have yet been formally proposed, (2) mitigation measures specific to future actions may not have been identified for many proposed projects, and (3) there is uncertainty whether mitigation measures for these actions will be fully implemented. However, when combined with climate change, a general trend in expected cumulative impacts can be estimated for each resource as described in Section 3.17.3, *Cumulative Impacts by Resource*.

Reasonably foreseeable future actions include actions that are likely to occur and affect the same resources as the Hatchery Program. For a future action to be considered reasonably foreseeable there must be a level of certainty that it will occur. Reasonably foreseeable future actions considered in this analysis include climate change, agricultural use, recreational use, hatchery production, and fisheries. Because of the large geographic scope of this analysis, it is not feasible to conduct a detailed assessment of all project-level activities that have occurred, are occurring, or are planned in the future for the cumulative impacts spatial and temporal boundaries. Rather, this cumulative impacts analysis qualitatively assesses the overall trends in cumulative impacts considering past, present, and reasonably foreseeable future actions, and describes how the alternatives contribute to those trends.

### 3.17.2.1 Climate Change

The changing climate is widely recognized as a long-term trend that is occurring throughout the world. Within the Pacific Northwest, Ford (2011) summarized expected climate changes in the coming years as leading to the following physical and chemical changes (certainty of occurring is in parentheses):

- Increased air temperature (high certainty)
- Increased winter precipitation (low certainty)
- Decreased summer precipitation (low certainty)
- Reduced winter and spring snowpack (high certainty)
- Reduced summer stream flow (high certainty)
- Earlier spring peak flow (high certainty)
- Increased flood frequency and intensity (moderate certainty)
- Higher summer stream temperatures (moderate certainty)
- Higher sea level (high certainty)
- Higher ocean temperatures (high certainty)
- Intensified upwelling (moderate certainty)
- Delayed spring transition (moderate certainty)
- Increased ocean acidity (high certainty)

These changes will affect human and other biological ecosystems within the spatial and temporal boundaries (Ecology 2012; Mauger et al. 2015; NWFSC 2015). Changes to biological organisms and their habitats are likely to include shifts in timing of life history events, changes in growth and development rates, changes in habitat and ecosystem structure, and rise in sea level and increased flooding (Littell et al. 2009; Johannessen and Macdonald 2009).

For the Pacific Northwest portion of the United States, Hamlet (2011) notes that climate changes will have multiple effects. Expected effects include:

- Overtaxing of storm water management systems at certain times
- Increases in sediment inputs into water bodies from roads
- Increases in landslides
- Increases in debris flows and related scouring that damages human infrastructure
- Increases in fires and related loss of life and property
- Reductions in the quantity of water available to meet multiple needs at certain times of year (e.g., for irrigated agriculture, human consumption, and habitat for fish)
- Shifts in irrigation and growing seasons
- Changes in plant, fish, and wildlife species' distributions and increased potential for invasive species
- Declines in hydropower production

- Changes in heating and energy demand
- Impacts on homes along coastal shorelines from beach erosion and rising sea levels

The most heavily affected ecosystems and human activities along the Pacific coast are likely to be near areas having high human population densities, and the continental shelves off Oregon and Washington (Halpern et al. 2009). These outcomes are likely regardless of which alternative is implemented for the Hatchery Program

#### 3.17.2.2 Agricultural Use

Agricultural practices within the spatial boundary of the Crystal Springs hatchery will likely continue. The area has long had a focus on agricultural crops such as potatoes, and this is not expected to change in the foreseeable future. The area also relies on a large and extensive aquifer, which tends to buffer the area against aspects of climate change that could alter water availability. No current or prospective programs have been identified that have a potential to alter this outcome, nor do any of the Hatchery Program alternatives have the potential to alter this outcome. Agricultural use in the area is expected to remain much as it is now, with no incremental cumulative impacts.

#### 3.17.2.3 Recreational Use

Recreational use within the spatial boundary of the proposed Yankee Fork and Panther Creek weir facilities is well established and will likely continue, with possible long-term growth. Due to the proximity of developed and dispersed recreation sites, it is expected that these areas will continue to be used for fishing, kayaking, camping, hiking, and horseback riding. Historical tourism attractions within the spatial boundary along the Yankee Fork, including the ghost towns of Bonanza and Custer and the abandoned mining dredge, will continue to attract tourists to these educational and interpretive sites. The future designation of Yankee Fork and Panther Creek as Wild and Scenic Rivers is also a possibility, in context of the ongoing review of such designation by USFS. No specific new recreational facilities are expected to be developed within the spatial boundary, and the continuation of ongoing recreational activities is not expected to result in incremental effects relative to current conditions. This would be the outcome regardless of which alternative is implemented for the Hatchery Program.

#### 3.17.2.4 Fisheries

Current and prospective activities within the spatial boundary are likely to affect salmon and steelhead fisheries over time. Landscape scale changes have altered fish habitat within the spatial boundary and may be expected to continue to do so. Changes primarily include climate variability and large-scale forest disturbance, principally by wildfire but also due to timber harvest, mining, insect infestation, and road construction. Harvest effects on natural-origin salmon and steelhead are expected to decrease over time to the extent that fisheries management programs continue to be reviewed and approved by the National Marine Fisheries Service under the Endangered Species Act (ESA), as evidenced by the beneficial changes to programs that have thus far undergone ESA review. One such program is the Lower Snake River Compensation Plan.

Under the Lower Snake River Compensation Plan, the U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife operate 10 hatcheries that mitigate for the construction (in the

1970s) of four federal dams on the lower Snake River in Washington. Over time, these hatcheries have increasingly been managed not only to produce fish to mitigate for dam effects, but also as conservation programs integrating natural-origin local broodstock to support recovery of threatened and endangered salmon and steelhead stocks in the Snake River system.

Fisheries management program compliance with conservation provisions of the ESA will ensure that listed species are not jeopardized, and that take under the ESA from salmon and steelhead fisheries is minimized or avoided. Where needed, reductions in effects on listed salmon and steelhead may occur through changes in areas or timing of fisheries, or changes in types of harvest methods used. To the extent that recovery of listed fish species occurs or species abundance becomes sufficiently large, harvest may increase in the future. These effects would occur regardless of whether the Proposed Action is implemented, but implementation of either Alternative 1 or Alternative 2 would be supportive of fisheries enhancement within the spatial boundary.

Sport and Tribal fisheries occur for other species within the spatial boundary as well. The Idaho Department of Fish and Game operates fish hatcheries that produce fingerlings and catchable trout and kokanee. These hatcheries have been in operation for decades and their operations are expected to continue for the foreseeable future. The Yellowstone cutthroat trout production component of the Proposed Action would provide a slight and highly localized increase in the production of trout within the spatial boundary, and this effect would occur under either Alternative 1 or Alternative 2.

## 3.17.3 Cumulative Impacts by Resource

This section presents an analysis by environmental resource of the cumulative impacts of past, present, and reasonably foreseeable future actions described in Section 3.17.2, *Past, Present, and Reasonably Foreseeable Future Actions*, in combination with the potential impacts of the Hatchery Program. The resources for which cumulative impacts are described include: land use and recreation; transportation; geology and soils; vegetation; water quality and quantity; wetlands and floodplains; fish; wildlife; cultural resources; socioeconomics and environmental justice; air quality and climate change; noise; and public health and safety. Table 3.17-2 summarizes the findings of this analysis.

Past and present actions relevant to the cumulative impact analysis in this EIS are referenced in the introduction to Chapter 3, *Affected Environment and Environmental Consequences*, of this Draft EIS, and are accounted for in the impacts analyses described in Sections 3.1 through 3.16. Table 3.17-1 summarizes past, present, and reasonably foreseeable actions that could be taken in the Salmon River basin that could incrementally add to impacts created by the Hatchery Program. Impacts from proposed facility operations were identified by examining how routine operational procedures could affect resources located both on and off the site. Such impacts were qualitatively described, including the impact mechanism, potential effects, duration (i.e., temporary or permanent), and likelihood of occurrence in light of the proposed operations' mitigation measures.

**Table 3.17-2. Past, Present, and Reasonably Forseeable Future Projects in the Salmon River Basin**

| Project Type | Project/Activities and Sponsor | Resource Affected |
|---|---|---|
| Past | Mining operations in the Blackbird Creek drainage – Private entities | Water quality, fish, wildlife |
| Past | Wild and Scenic Rivers eligibility determination for Yankee Fork and Panther Creek – U.S. Forest Service (USFS 1989) | Recreation, geology, water quality and quantity, fish, cultural resources, visual quality |
| Past, present, and future | Agricultural practices, including irrigation – Private entities | Water quality and quantity, fish, wildlife |
| Past, present, and future | Recreational use of Yankee Fork and Panther Creek (kayaking, fishing, camping) – Private entities | Recreation, fish, wildlife, visual quality |
| Past, present, and future | Fort Hall habitat restoration project – Shoshone-Bannock Tribes | Fish, wildlife |
| Past, present, and future | Salmon River habitat restoration project – Shoshone-Bannock Tribes | Fish, wildlife |
| Past, present, and future | Operation of rotary screw trap and passive integrated transponder (PIT) arrays to monitor fish populations | Fish |
| Past, present, and future | Sawtooth Fish Hatchery – Idaho Department of Fish and Game | Fish, water quality and quantity |
| Past, present, and future | Pahsimeroi Fish Hatchery – Idaho Power | Fish, water quality and quantity |
| Past, present, and future | Snake River Steelhead Program – Idaho Department of Fish and Game | Fish, water quality and quantity |
| Past, present, and future | Squaw Creek weir – Idaho Department of Fish and Game | Fish, water quality and quantity |
| Past, present, and future | Lower Snake River Compensation Plan | Fish |
| Present and future | Springfield Fish Hatchery – Idaho Department of Fish and Game | Water quality and quantity |
| Future | Panther Creek rotary screw trap and passive integrated transponder tag array – Shoshone-Bannock Tribes | Fish |
| Future | Idaho Cobalt Project - Private | Fish, water quality and quantity |
| Future | Yankee Fork Restoration project – Shoshone-Bannock Tribes | Recreation, water quality, fish, wildlife |
| Future | Use of Yankee Fork weir facilities to support the Lower Snake River Compensation Plan steelhead program under Idaho Department of Fish and Game | Fish |

Many plans; federal, state, and county regulations; and laws are in place to reduce effects of land use activities and to restore habitat. However, it is unclear if these plans, regulations, and laws will be successful in meeting their environmental goals and objectives. Additionally, it is not possible to predict the magnitude of effects from future development and habitat restoration with certainty for several reasons: (1) the activities may not have yet been formally proposed, (2) mitigation measures specific to future actions may not have been identified for many proposed projects, and (3) there is uncertainty whether mitigation measures for these actions will be fully implemented. However, when combined with climate change, a general trend in expected cumulative impacts can be estimated for each resource as described in Section 3.17.3, *Cumulative Impacts by Resource*.

Reasonably foreseeable future actions include actions that are likely to occur and affect the same resources as the Hatchery Program. For a future action to be considered reasonably foreseeable there must be a level of certainty that it will occur. Reasonably foreseeable future actions considered in this analysis include climate change, agricultural use, recreational use, hatchery production, and fisheries. Because of the large geographic scope of this analysis, it is not feasible to conduct a detailed assessment of all project-level activities that have occurred, are occurring, or are planned in the future for the cumulative impacts spatial and temporal boundaries. Rather, this cumulative impacts analysis qualitatively assesses the overall trends in cumulative impacts considering past, present, and reasonably foreseeable future actions, and describes how the alternatives contribute to those trends.

**Table 3.17-3. Summary Determination of Cumulative Impacts.**

| Resource | Cumulative Impact by Action Alternative: Alternative 1 — Full Production | Alternative 1 — 50% Production | Alternative 2 — Full Production | Alternative 2 — 50% Production |
|---|---|---|---|---|
| Land Use and Recreation | Low | Low | Low | Low |
| Transportation | Low, except Moderate for construction at Panther Creek site | Low, except Moderate for construction at Panther Creek site | Low | Low |
| Geology and Soils | Low | Low | Low | Low |
| Vegetation | Low | Low | Low | Low |
| Water Quality and Quantity | Low, except Moderate for water quantity in the Crystal Springs hatchery area | Low, except Moderate for water quantity in the Crystal Springs hatchery area | Low, except Moderate for water quantity in the Crystal Springs hatchery area | Low, except Moderate for water quantity in the Crystal Springs hatchery area |
| Wetlands and Floodplains | Low | Low | Low | Low |
| Fish | Low adverse and Moderate beneficial effects | Low adverse and Moderate beneficial effects | Low adverse and Moderate beneficial effects | Low adverse and Moderate beneficial effects |
| Wildlife | Low | Low | Low | Low |
| Cultural Resources | Low adverse and Moderate to High beneficial effects | Low adverse and Moderate to High beneficial effects | Low adverse and Moderate to High beneficial effects | Low adverse and Moderate to High beneficial effects |
| Socioeconomics and Environmental Justice | Low adverse and High beneficial effects for socioeconomics, Low beneficial effects for environmental justice | Low adverse and High beneficial effects for socioeconomics, Low beneficial effects for environmental justice | Low adverse and High beneficial effects for socioeconomics, Low beneficial effects for environmental justice | Low adverse and High beneficial effects for socioeconomics, low beneficial effects for environmental justice |
| Air Quality and Climate Change | Low | Low | Low | Low |
| Visual Quality | Low for Crystal Springs hatchery and Yankee Fork weir facility, Moderate for Panther Creek weir facility | Low for Crystal Springs hatchery and Yankee Fork weir facility, Moderate for Panther Creek weir facility | Low | Low |
| Noise | Low | Low | Low | Low |
| Public Health and Safety | Low | Low | Low | Low |

### 3.17.3.1 Land Use and Recreation

Land use within the spatial boundary has incrementally changed as past road and recreational development has cumulatively established current land use patterns. This trend would be expected to continue under all alternatives. Alternatives 1 and 2 would introduce new facilities within the spatial boundary that would remove small parcels of land from other uses. No other types of land use change are expected to result from this; for instance, implementation of Alternatives 1 or 2 would not affect the probability of other development activity occurring within the spatial boundary.

It is not anticipated that the Crystal Springs hatchery under Alternative 1 and Alternative 2, or the full and 50% production options, would contribute to a cumulative impact on the surrounding agricultural land uses, including the ability of adjacent landowners to use groundwater for irrigation. As discussed in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, groundwater levels in the Eastern Snake Plain Aquifer 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 prompting a need for increased irrigation efficiency (SPF Water Engineering 2010). Existing and proposed new wells would supply the hatchery even if deep groundwater levels continue to decline. The increased groundwater withdrawals would incrementally contribute to a reduction in groundwater levels at a localized level, but would not contribute to permanent changes in water level or the ability to irrigate adjacent land beyond current trends. Thus, the cumulative impact on land use would be **low**.

Recreation resources availability within the spatial boundary has incrementally increased in the past due to development, and this trend is expected to continue regardless of which alternative is implemented. Designation of either Yankee Fork or Panther Creek as a Wild and Scenic River could contribute to an overall increase in recreational use within the spatial boundary. Implementation of either Alternative 1 or Alternative 2 would create a barrier in the affected streams (Yankee Fork and Panther Creek) during the time of year when the river is used for recreational purposes such as boating and fishing. However, since the facilities would be small and portage trail would be provided to allow boaters to bypass the weir facilities, both action alternatives would have a **low** cumulative impact on recreation.

The Hatchery Program actions proposed for the Yankee Fork would include moving a portion of Yankee Fork Road and other recreation facilities, as described in Chapter 2, *Alternatives, Including the Proposed Action*. Temporary impacts on recreational users would result (Callaghan pers. comm.) due to temporary closure of the Pole Flat Campground and partial (one-lane or brief-duration) closures of Yankee Fork Road. These temporary impacts would have a **low** cumulative impact on recreation, and the impacts would not last beyond a single season of recreational use.

### 3.17.3.2 Transportation

No reasonably foreseeable future projects were identified within the spatial boundary that would coincide with the construction of the Crystal Springs hatchery in a way that would create a combined impact on transportation along roads providing access to the facility under Alternative 1 and Alternative 2, or the full and 50% production options. Based on the USFS *Schedule of Proposed Actions for the Salmon-Challis National Forest* (USFS 2015b), there are no reasonably foreseeable future projects (Table 3.17-1) planned for the vicinity of the proposed Yankee Fork weir facility or the Panther Creek weir facility, which, when considered with the effects of implementing Alternative 1 and Alternative 2, could result in permanent cumulative impacts on transportation. Thus, cumulative impacts on transportation in the vicinity of the Yankee Fork and Panther Creek weir facilities would be the impacts associated with both alternatives.

Construction and roadwork would result in temporary delays on Yankee Fork Road, and operations would result in a minor increase in traffic on roads serving the Yankee Fork weir facility. Therefore, both Alternative 1 and Alternative 2 (and both full and 50% production options) would result in a permanent, **low** cumulative impact on transportation. Road construction on Yankee Fork Road would also result in a temporary, **low** cumulative impact on transportation, under Alternative 1 (under Alternative 2, that construction work would not occur).

Construction and roadwork would result in temporary delays on Panther Creek Road, and operations would result in a minor increase in traffic on roads serving the Panther Creek weir facility. Therefore, both Alternative 1 and Alternative 2 (and both full and 50% production options) would result in a permanent, **low** cumulative impact on transportation. Road construction on Panther Creek Road would, however, result in a long detour around the construction site lasting up to 4 weeks, a temporary, **moderate** cumulative impact on transportation, under Alternative 1 (under Alternative 2, that construction work would not occur).

#### 3.17.3.3 Geology and Soils

No reasonably foreseeable future projects were identified within the spatial boundary that would coincide with the construction of the Crystal Springs hatchery in a way that would create a combined impact on geology and soils. Based on the USFS *Schedule of Proposed Actions for the Salmon-Challis National Forest* (USFS 2015b), there are no reasonably foreseeable future projects planned for the immediate vicinity near the proposed Yankee Fork weir facility or the Panther Creek weir facility, which, when considered with the effects of implementing Alternative 1 and Alternative 2, or the full and 50% production options, could result in cumulative impacts on geology and soil. Therefore, both alternatives constitute the only identified cumulative impact on geology and soils. Those impacts constitute seismic risk, slope instability, soil settlement, soil depletion or erosion, channel migration, channel sedimentation, and channel scope. As detailed in Section 3.3, *Geology and Soils*, all such impacts are low, resulting in **low** cumulative impacts.

#### 3.17.3.4 Vegetation

No reasonably foreseeable future projects were identified within the spatial boundary that would coincide with the construction of the Crystal Springs hatchery in a way that would create a combined impact on vegetation within the spatial boundary. Based on the USFS *Schedule of Proposed Actions for the Salmon-Challis National Forest* (USFS 2015b), there are no reasonably foreseeable future projects planned within the spatial boundary near the proposed Yankee Fork weir facility or the Panther Creek weir facility, which, when considered with the effects of implementing Alternative 1 and Alternative 2, could result in cumulative impacts on vegetation. Therefore, both alternatives constitute the only identified cumulative impact on vegetation. Those impacts primarily constitute vegetation removal and risk of invasive plant establishment. As detailed in Section 3.4, *Vegetation*, all such impacts are low, resulting in **low** cumulative impacts.

### 3.17.3.5 Water Quality and Quantity

Section 3.5.1, *Affected Environment*, describes the baseline conditions of water quantity and water quality for the Crystal Springs hatchery, the Yankee Fork weir facility and the Panther Creek weir facility locations. These conditions are the result of many years of climate change, habitat restoration, hatchery operations, historic and current mining operations, wild fires, and development.

#### Water Quality

Within the spatial boundary, water quality in McTucker Creek and American Falls Reservoir is affected by a number of on-going activities resulting in non-point source pollutants, including agriculture, livestock grazing, roads, and urban runoff. There are also 13 point source discharges under National Pollutant Discharge Elimination System permits contributing to American Falls Reservoir water quality, including four municipal wastewater discharges, five confined animal feeding operations, and two hatcheries.

Under the current total maximum daily load for the American Falls subbasin (IDEQ et al. 2012), which lies within the spatial boundary, the potential contribution of nutrients and sediments from the proposed Crystal Springs hatchery has been accounted for in the overall loading allocations of pollutants (total phosphorus and sediments) to the American Falls subbasin to maintain water quality standards. The proposed Crystal Springs hatchery would discharge additional nutrients, sediments, and therapeutic chemicals to the American Falls subbasin. There are other ongoing discharges to the American Falls subbasin that are impacting water quality from municipal wastewater discharges, confined animal feeding operations, and two other hatcheries. When added to the past, present, and reasonably foreseeable future actions within the spatial boundary, the adverse cumulative impacts from the proposed Crystal Springs hatchery on water quality are **low** for both Alternative 1 and Alternative 2 and both the full and 50% production options.

As noted in Section 3.5.2.1, *Alternative 1: Hatchery Program with Permanent Weirs*, implementation of Alternatives 1 and 2 at the Crystal Springs hatchery site could result in low increases in turbidity following rainfall events, effluent discharge containing low concentrations of nutrients derived from fish waste and excess feed, and therapeutic chemicals into nearby waterways. These adverse impacts, however, would be minimized through the use of best management practices resulting in low impacts on water quality that would result in **low** cumulative impacts on water quality for both Alternative 1 and Alternative 2 and both the full and 50% production options.

Construction of the Yankee Fork weir facility under Alternative 1 could result in the potential for temporary construction-related runoff of sediment to the Yankee Fork. However, best management practices (see Section 3.1.4.2, *Alternatives 1 and 2—Mitigation,* for the Crystal Springs hatchery), would minimize this potential, and the small potential incremental increase of sediment to the Yankee Fork would result in **low** adverse cumulative impacts on the beneficial uses of the river under both fish production options. Under Alternative 2, the Yankee Fork weir facility would not be constructed and would not contribute to cumulative impacts.

The proposed Yankee Fork weir facility under Alternative 1 would non-consumptively divert up to 10 cubic feet per second of the Yankee Fork stream flow for 1,260 feet below the intake point through the fish ladder to the Yankee Fork. The temporary discharge could contain minimal amounts organic solids shed during the adult holding process from June through mid-October each year, and minor amounts (less than 1 milligram per liter) of formalin if fish need to be periodically treated. As detailed in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, when the permanent Yankee Fork weir facility is added to past, present, and reasonably foreseeable future actions within the spatial boundary, the cumulative impacts of organic solids and formalin discharges would be **low** for Alternative 1 under both full and 50% production options. Under Alternative 2, the Yankee Fork weir facility would not be constructed and would not contribute to cumulative impacts.

Several mining operations and mine cleanup activities exist in the Panther Creek basin, primarily contributing metals and other non-organic pollutants to water quality. Based on the USFS *Schedule of Proposed Actions for the Salmon-Challis National Forest* (USFS 2015b), there are no reasonably foreseeable future projects planned in the vicinity of the proposed Panther Creek weir facility. The Idaho Cobalt Project, a proposed mine in the watershed, has not been developed although a Record of Decision was issued in 2008, and its development is not foreseeable due to both financial and regulatory issues.

The construction of the permanent Panther Creek weir facility could result in the potential for temporary construction-related runoff of sediment to the Panther Creek. However, best management practices (see Section 3.1.4.2, *Alternatives 1 and 2—Mitigation*, for the Crystal Springs hatchery) would minimize this potential, and the small potential incremental increase of sediment to Panther Creek would not cumulatively adversely affect the water quality of the creek.

The Panther Creek weir facility under Alternative 1 would non-consumptively divert up to 10 cubic feet per second of the Panther Creek stream flow for 1,150 feet below the intake point through the fish ladder to Panther Creek. The temporary discharge from this diversion could contain minimal amounts of organic solids shed (e.g., fish scales; however, no feces as the fish would not be feeding) during the adult holding process from June through October each year, and minor amounts of formalin, if fish need to be treated. There may also be temporary elevated nutrients from the acclimation ponds discharge during the April–May acclimation of Chinook salmon smolts. However, the vast majority of the solids would be removed from the effluent flow prior to discharge, and this point-source discharge would be regulated by an individual or regional National Pollutant Discharge Elimination System permit to protect water quality. Thus, when added to the past, present, and reasonably foreseeable future actions, the cumulative impact from the permanent weir and facilities at Panther Creek on water quality within the spatial boundary would be **low** for Alternative 1 under both full and 50% production options. Under Alternative 2, the Panther Creek weir facility would not be constructed and would not contribute to cumulative impacts.

Climate change and development are expected to affect water quality primarily by increasing water temperatures. Temperature changes may also have secondary effects such as changes in dissolved oxygen content. While the Hatchery Program proposed under Alternatives 1 and 2 may change as recovery goals are met, the Hatchery Program's impacts on water quality are not likely to change substantially because water use would be similar. Reductions in hatchery production or the termination of the Hatchery Program would reduce the Hatchery Program's impacts on water quality within the spatial boundary to the extent that less water would be used for hatchery operations.

Fisheries for Chinook salmon and Yellowstone cutthroat trout would not be expected to affect water quality. Overall, cumulative impacts of climate change, development, and hatchery production on water quality within the spatial boundary are not likely to substantially alter the impacts described in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, and resultant effects are still expected to be **low** under both Alternative 1 and Alternative 2 and both full and 50% production options.

## Water Quantity

Regional groundwater levels in the Eastern Snake Plain Aquifer, part of which lies within the spatial boundary, have exhibited declining trends over time, which have been associated with both drought conditions through the late 1990s and increased agricultural irrigation (SPF Water Engineering 2010). Existing activities in this portion of the spatial boundary, which include agriculture and the Springfield Hatchery (Table 3.17-1), have had and will continue to have an effect on regional groundwater levels. In addition to the proposed hatchery operations, agricultural water uses may continue to increase the demand for groundwater within the spatial boundary. Any such increased use would also be drawn from the Eastern Snake Plain Aquifer. Assuming that declines in the regional aquifer observed in recent decades could continue at comparable rates in the future, this 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 Eastern Snake Plain Aquifer Comprehensive Aquifer Management Plan, which establishes a long-term plan for water supply management and demand in the Eastern Snake Plain Aquifer (IDWR 2009).

The proposed Crystal Springs hatchery operations' water use would be expected to impact groundwater and surface water quantity, but would only be a small portion of the withdrawals compared to current and reasonably foreseeable withdrawals in the area. The adverse cumulative impacts of the proposed Crystal Springs hatchery on groundwater and surface water quantity when added to past, present, and reasonably foreseeable actions are expected to be **low** for both Alternative 1 and Alternative 2 and both full and 50% production options.

There are no current or prospective water diversions in Yankee Fork within the spatial boundary that could result in adverse cumulative impacts (Table 3.17-1). The surface water diversion proposed under Alternative 1 is non-consumptive, and flow is returned to Yankee Fork 1,260 feet downstream of the diversion. No groundwater would be affected by operation of the Yankee Fork weir facility. For this reason, the cumulative impact of the Yankee Fork weir facility on groundwater and surface water quantity within the spatial boundary is expected to be **low** for Alternative 1 under both full and 50% production options. Under Alternative 2, the Yankee Fork weir facility would not be constructed and would not contribute to cumulative impacts.

There are no current or prospective water diversions in Panther Creek within the spatial boundary that could result in adverse cumulative impacts (Table 3.17-1). The surface water diversion proposed under Alternative 1 is non-consumptive, and flow is returned to Panther Creek 1,150 feet downstream of the diversion. No groundwater would be affected by operation of the Panther Creek weir facility. Therefore, adverse cumulative impacts within the spatial boundary from the permanent Panther Creek weir facility are expected to be **low** for Alternative 1 under both full and 50% production options. Under Alternative 2, the Panther Creek weir facility would not be constructed and would not contribute to cumulative impacts.

Climate change and development are expected to affect water quantity by changing seasonality and magnitude of river flows. While the Hatchery Program proposed under Alternatives 1 and 2 may change as recovery goals are met, the Hatchery Program's impacts on water quantity are not likely to change substantially because water use would be similar. Reductions in hatchery production would reduce the Hatchery Program's impacts on water quantity within the spatial boundary to the extent that less water would be used for hatchery operations.

Fisheries for Chinook salmon and Yellowstone cutthroat trout would not be expected to affect water quantity. Overall, cumulative impacts of climate change, development, and hatchery production on water quantity within the spatial boundary are not likely to substantially alter the impacts described in Section 3.5, *Groundwater and Surface Water Quality and Quantity*, except to the extent that they result in further drawdown of the Eastern Snake Plain Aquifer. Additional drawdown of the aquifer which would result in a **moderate** cumulative impact on water quantity that would be of the same magnitude under both Alternative 1 and Alternative 2 and both full and 50% production options.

### 3.17.3.6 Wetlands and Floodplains

Within the Crystal Springs hatchery area of the spatial boundary, no reasonably foreseeable future projects were identified that could affect wetlands (Table 3.17-1), so cumulative impacts on wetlands would be the same as the direct impacts of either Alternative 1 or Alternative 2 for both the full and 50% production options. For the reasons described in Section 3.6, *Wetlands and Floodplains*, permanent impacts would be **low**. Since there are no floodplains at the Crystal Springs hatchery site, there would be **no** permanent impacts under any of the alternatives.

Within the Yankee Fork area of the spatial boundary, the proposed Yankee Fork restoration project (Table 3.17-1) may result in beneficial impacts for wetlands and floodplains. Considered in conjunction with either Alternative 1 or Alternative 2, this would result in neutral or beneficial impacts on wetlands and floodplains in the Yankee Fork within the spatial boundary.

Within the Panther Creek area of the spatial boundary, no reasonably foreseeable future projects were identified that could affect wetlands and floodplains (Table 3.17-1), so cumulative impacts on wetlands and the floodplains would be the same as the direct impacts of either Alternative 1 or Alternative 2 for both the full and 50% production options. For the reasons described in Section 3.6, *Wetlands and Floodplains*, permanent impacts would be **low**.

### 3.17.3.7 Fish

Table 3.17-1 notes a variety of projects within the spatial boundary that have the potential to affect the status of fish populations. Ongoing (past, present and future) projects include the following:

- The Fort Hall habitat restoration project affects fish habitat in the areas proposed for Yellowstone cutthroat trout stocking.
- The Springfield Fish Hatchery is located near the proposed Crystal Springs hatchery.
- The Sawtooth Fish Hatchery and Pahsimeroi Fish Hatchery produce Chinook salmon that will comprise the foundation for broodstock to the Yankee Fork and Panther Creek respectively.
- The Salmon River habitat restoration project improves fish habitat in the Salmon River basin, which includes both the Yankee Fork and Panther Creek.
- The Idaho Department of Fish and Game operates a Snake River steelhead program in the Upper Salmon River, along with appropriate facilities to manage the fishery, which is potentially related to the proposed Yankee Fork trapping facility. If Alternative 1 is selected, the Yankee Fork weir facility could be used to assist in collecting broodstock for the Upper Salmon River steelhead program. The steelhead program offers opportunities for both Tribal and non-Tribal anglers to pursue steelhead throughout the Upper Salmon River.

- The Lower Snake River Compensation Plan is a U.S. Fish and Wildlife Service program to mitigate for anadromous fish losses in the Snake River basin at the lower four Snake River dams.

  Currently the Lower Snake River Compensation Plan funds numerous hatchery programs throughout the Snake River basin, including programs in the Upper Salmon River like the Sawtooth Fish Hatchery, that have the potential to impact the status of fish populations in the foreseeable future. Currently, the Tribes and Idaho Department of Fish and Game have partnered with the Lower Snake River Compensation Plan to develop a program for Snake River spring/summer-run Chinook salmon and Snake River steelhead in the Yankee Fork that would be complemented by implementation of the proposed Hatchery Program. If Alternative 1 is selected, the Yankee Fork weir facility could be used to assist in collecting broodstock for the Snake River steelhead program.

In addition, the following projects have the potential to affect fish, but have not yet been fully implemented:

- The Yankee Fork Restoration project is a Tribes BPA Fish Accord program designed to enhance fish habitat along a 5-mile-long reach of the Yankee Fork. This reach was heavily impacted by dredge mining in the early twentieth century, leaving the river in a narrow, confined channel that did not offer common in-stream habitat features associated with healthy stream systems. Beginning in 2012, the Tribes partnered with Trout Unlimited, State of Idaho, USFS, and Bureau of Reclamation to implement habitat projects to improve in-stream habitat complexity for all life stages of Chinook salmon in the Yankee Fork. The program's implementation is directly tied to the proposed Hatchery Program objective of increasing abundance of natural-origin fish produced in the system by restoring affected habitats to a more normative condition.
- The Idaho Cobalt Project, a proposed mine in the watershed, has not been developed although a Record of Decision was issued in 2008, and its development is not currently foreseeable due to both financial and regulatory issues.
- The Panther Creek rotary screw trap and passive integrated transponder (PIT) tag array are proposed for seasonal installation beginning summer 2017. The rotary screw trap is used to monitor and enumerate juvenile spring-run Chinook salmon and steelhead. The PIT tag array is used to detect and identify fish marked with PIT tags. Both structures provide the Tribes with information about the use of Panther Creek by anadromous and resident fish.

The Springfield Fish Hatchery program grows Snake River sockeye salmon for stocking at headwater lakes in the Salmon River system, while the proposed Crystal Springs hatchery would primarily grow Snake River spring/summer-run Chinook salmon for stocking in the Salmon River system. Therefore, these two hatcheries would not directly benefit fish or fish habitat in the vicinity of the hatcheries and would have a **low** adverse impact for the reasons discussed in Section 3.7, *Fish* (i.e., minor operational impacts associated with water quality in hatchery discharge waters). Those impacts are associated with the Springfield Fish Hatchery as well as with the proposed Crystal Springs hatchery; both hatcheries discharge to streams tributary to the American Falls Reservoir.

All projects and programs named above are intended and expected to yield beneficial effects on fisheries and/or fish habitat within the spatial boundary due to improvements in the abundance of fish and the quality of fish habitat. The existing programs have been successful in this purpose and have demonstrated at least a **moderate** beneficial effect on fish and fisheries. The proposed programs likewise have a reasonable expectation of success and thus can be expected to produce at least a **moderate** beneficial effect on fish and fisheries in the future. If these programs lead, as hoped, to delisting of one or more threatened or endangered Snake River salmon runs, then that would indicate a **high** beneficial effect. This determination applies to all alternatives, including Alternative 1, Alternative 2, and the No Action Alternative; and also applies to both full and 50% production options within each action alternative.

There are also minor adverse impacts associated with both the existing programs named above, and with the proposed Hatchery Program. Actions that release hatchery-origin fish to waters occupied by natural-origin fish, including both Alternative 1 and Alternative 2, introduce the potential for competition between these two groups. They may compete for food, for rearing habitat, or for mates. Hatchery-origin fish sometimes prey upon natural-origin fish, and vice-versa; the former impact would be adverse.

Section 3.7, *Fish*, details these potential interactions for the Hatchery Program. Within the spatial boundary, the production and release of spring Chinook salmon in Yankee Fork and Panther Creek could impact hatchery fish and fish naturally present in these systems. Juvenile spring Chinook salmon could be a food source for bull trout, a positive impact; however, hatchery juvenile spring Chinook salmon could compete for rearing habitat with natural Chinook salmon in Yankee Fork and Panther Creek. Releasing hatchery Chinook salmon when they are ready to outmigrate reduces the temporal and spatial overlap of hatchery and natural-origin Chinook salmon. Additionally, hatchery and juvenile spring Chinook salmon could compete for rearing habitat with natural steelhead, although the two species tend to use different micro-habitats, so direct competition is minimal. Returning adult Chinook salmon from the Hatchery Program may compete with natural-origin adults in Yankee Fork and Panther Creek. Because current natural-origin abundance is low, and the Hatchery Program is designed to reintroduce and integrate the hatchery and natural fish, the availability of returning hatchery-origin Chinook salmon may increase overall abundance in both Yankee Fork and Panther Creek. Similarly, bull trout and spring Chinook salmon spawn timing overlaps, in the Salmon River basin there is little spatial overlap in spawning areas, although this could change as spring Chinook salmon numbers increase and they seek additional suitable spawning habitat. Overall, these types of impact create a **low** cumulative impact.

The extent to which these benefits are realized would depend on how the Salmon River ecosystem and its fish species respond to the environmental effects of climate change. The projected changes in hydrology and temperature are likely to negatively affect aquatic ecosystems within the spatial boundary, with bull trout and other salmonids being especially sensitive.

Analyses of climate change impacts suggest that temperature increases alone will render 2–7% of existing salmonid habitat in the Pacific Northwest unsuitable by 2030, 5–20% by 2060, and 8–33% by 2090. Salmon habitat is likely to be more severely impacted because anadromous species are restricted to lower elevation habitats that are likely to experience even warmer temperatures. Salmon habitat loss would be most severe in Oregon and Idaho, with potential losses exceeding 40% by 2090. Loss of salmon habitat in Washington would be less severe, with the worst case showing about a 22% loss by 2090. These estimates do not consider the associated impact of changing hydrology (Independent Scientific Advisory Board 2007). Ecological changes are likely to occur in all the tributary systems of the Columbia Basin, an area that includes the spatial boundary. Thus, although potential restoration projects within the spatial boundary could contribute to increased fish populations and habitat, the benefits of the habitat improvements could be reduced by climate change.

### 3.17.3.8 Wildlife

None of the actions listed in Table 3.17-1 has the potential to result in other than negligible cumulative impacts on wildlife. Thus, cumulative impacts on wildlife within the spatial boundary would primarily be associated with implementation of either Alternative 1 or Alternative 2, and either the full or 50% production options.

As discussed in Section 3.8, *Wildlife*, Alternatives 1 and 2 would both cause an incremental increase in wildlife habitat loss within the spatial boundary. These impacts would result from operations of facilities at each of three sites (Crystal Springs, Yankee Fork, and Panther Creek), and would primarily result in an increase in human activity at these sites. These sites are already associated with existing human activity and vehicle traffic, and the incremental cumulative impact of either Alternative 1 or Alternative 2 would be **low**.

### 3.17.3.9 Cultural Resources

None of the actions listed in Table 3.17-1 has the potential to result in other than negligible cumulative impacts on cultural resources. Thus, cumulative impacts on cultural resources within the spatial boundary would primarily be associated with implementation of either Alternative 1 or Alternative 2, and with both full production and 50% production options. For the reasons detailed in Section 3.9, *Cultural Resources*, those would be **low** impacts under both Alternatives 1 and 2, and both full and 50% production options.

With the increase in Tribal fishing opportunities within the spatial boundary, combined with other fish and habitat restoration efforts, the implementation of either Alternative 1 or Alternative 2 and either full or 50% production option would have moderate to high cumulative effects on Tribal access to an important cultural resource—Chinook salmon (within the Salmon River basin portion of the spatial boundary) and Yellowstone cutthroat trout (within the Fort Hall Reservation).

### 3.17.3.10 Socioeconomics and Environmental Justice

None of the actions listed in Table 3.17-1 has the potential to result in other than minor and highly localized cumulative impacts on either socioeconomic conditions or environmental justice. Although general development within the spatial boundary could continue over time, local planning provides a process for increasing services to meet forecasted demands.

Thus, cumulative impacts on socioeconomic conditions or environmental justice within the spatial boundary would primarily be associated with implementation of either Alternative 1 or Alternative 2. As described in Section 3.10, *Socioeconomics and Environmental Justice*, both alternatives would have very **low** impacts on most socioeconomic indicators, but would have a **high** impact due to the cultural and spiritual value associated with reintroducing Chinook salmon to the diet of Tribal members. Because Tribal members are also the principal socioeconomic group that would be affected, they would likewise experience a beneficial impact with regard to environmental justice; that impact would be **low**. These outcomes would result under both Alternative 1 and Alternative 2 and both full and 50% production options.

### 3.17.3.11 Air Quality and Climate Change

As discussed in Section 3.11, *Air Quality and Climate Change*, Alternative 1 and Alternative 2 would cause low, short-term effects on air quality within the spatial boundary, primarily from increased dust during construction. These impacts would be mitigated. Therefore, both Alternative 1 and Alternative 2 and both full and 50% production options would have low cumulative impacts on air quality when combined with agricultural and other activities within the spatial boundary (Table 3.17-1) that increase particulate levels and reduce the region's air quality. Temporary and long-term emissions from vehicles and equipment used during construction and operation of the facility would be below U.S. Environmental Protection Agency reporting levels for greenhouse gas emissions; therefore, Alternative 1 and Alternative 2 would have **low** cumulative impacts on climate change conditions when considered with vehicle use and other sources of emissions within the spatial boundary.

### 3.17.3.12 Visual Quality

As discussed in Section 3.12, *Visual Quality,* there are no formally designated recreational or scenic resources in the vicinity of the proposed hatchery facility that would be affected by the Hatchery Program. No other known activities within the spatial boundary (Table 3.17-1) would contribute to cumulative beneficial or adverse impacts on the area's visual quality. Accordingly, cumulative impacts on visual quality are primarily those impacts associated with Alternative 1 and Alternative 2, which are described in Section 3.12, *Visual Quality*.

Both construction and operations at the Crystal Springs hatchery site would affect a low number of viewers, who have a low sensitivity due to the agricultural nature of surrounding land uses. Therefore, the cumulative impacts of the Crystal Springs hatchery on visual resources would be **low** for Alternative 1 and Alternative 2 and for both full and 50% production options.

Construction at the Yankee Fork weir facility would create temporary changes in views of and from the surrounding area, particularly as seen by recreationalists using the river or travelers along Yankee Fork Road. Although viewer sensitivity is moderate and the number of affected viewers from the river and traveling along Yankee Fork Road would be moderate, mitigation measures would be implemented to help ensure the facility blends in with the visual landscape. With these measures, it is not anticipated that built features would result in adverse visual effects because they would be similar to existing development within the spatial boundary. Therefore, the cumulative impacts of the Yankee Fork weir facility on visual resources would be **low** for both Alternative 1 and Alternative 2 and for both full and 50% production options.

Visually, the Panther Creek weir facility would be similar to that proposed at the Yankee Fork weir facility, but smaller in scale. Construction of the weir facility would create temporary changes in the views of and from the surrounding area, particularly by recreationalists along the river or using Panther Creek Road. Viewer sensitivity is moderate to high, and the number of affected viewers at the site and traveling along Panther Creek Road would be moderate. The construction of a new modern, industrial-appearing facility adjacent to the Cobalt Work Center would introduce a new visual element to the landscape surrounding the Panther Creek weir facility. However, the Panther Creek weir structures would be similar in scale to the work center structures, and measures would be taken to ensure the Panther Creek weir facility complements the existing visual landscape. The resulting cumulative impact on the visual landscape from introduction of both Yankee Fork and Panther Creek weir facilities would be **moderate** under both Alternative 1 and Alternative 2 and both full and 50% production options.

The Panther Creek bridge weir would introduce a new visual element; however, it would be placed downstream of an existing bridge over the creek, so it would be in close proximity to an existing, similar visual condition associated with a creek crossing. The proposed acclimation holding ponds that would be located west of Panther Creek Road would introduce rounded, aboveground structures into a landscape where existing buildings are rectangular. Therefore, they would be visually dissimilar and could detract from existing views if not properly designed. Overall, the impacts of the Panther Creek weir facility on the visual landscape would be **low to moderate** for Alternative 1. For Alternative 2, there would be no acclimation holding ponds, but a temporary weir facility would still be introduced, resulting in a **low** adverse cumulative impact. Effects would be similar under both full and 50% production options. The No Action Alternative would not have direct cumulative effects on the existing scenic character or Visual Quality Objective designations of the forest because vegetation and site features within the Area of Visual Effect would remain largely intact as seen from sensitive viewpoints.

### 3.17.3.13 Noise

As discussed in Section 3.13, *Noise*, construction noise from Alternative 1 and Alternative 2 would have temporary low to moderate local noise impacts. There are no major, reasonably foreseeable construction projects planned for the immediate vicinity near the proposed hatchery. Average daily traffic counts of less than 100 vehicles per day were reported on River Road and adjacent roads (Reich pers. comm.), which would result in an average hourly level of 44 A-weighted decibels at a distance of 50 feet. This is roughly equal to existing ambient levels. Operation of the proposed hatchery could slightly increase noise levels at the hatchery due to year-round activity, but noise levels would not exceed Idaho standards for quiet areas, and there are no known new sources of noise that would have long-term adverse cumulative impacts on residences in the vicinity. Therefore, cumulative noise-related impacts under both Alternative 1 and Alternative 2 and both full and 50% production options would be **low**.

There are no major construction projects planned for the immediate vicinity near the proposed Yankee Fork weir facility. Average daily traffic counts of 386 vehicles per day were reported on Yankee Fork Road in 2010 (Reich pers. comm.), and are projected to increase to 420 vehicles per day. This increase would result in an average hourly level of 50 A-weighted decibels at a distance of 50 feet, which would be just discernible above existing ambient levels. Therefore, cumulative impacts of construction noise under Alternative 1 (both full and 50% production options) would be **low**. Construction would not occur at Yankee Fork under Alternative 2, so there would be no cumulative impacts.

There are no major construction projects planned for the immediate vicinity near the proposed Panther Creek weir facility. Average daily traffic counts of less than 100 vehicles per day were reported on Panther Creek Road (Reich pers. comm.), which would result in an average hourly level of 44 A-weighted decibels at a distance of 50 feet. This is roughly equal to existing ambient levels; therefore, cumulative impacts of construction noise under Alternative 1 (both full and 50% production options) would be **low**. This construction would not occur at Panther Creek under Alternative 2, so there would be no cumulative impacts due to construction noise.

### 3.17.3.14 Public Health and Safety

None of the actions listed in Table 3.17-1 has the potential to result in other than negligible cumulative impacts on public health and safety. Thus, cumulative impacts on public health and safety within the spatial boundary would primarily be associated with implementation of either Alternative 1 or Alternative 2, and with both full production and 50% production options. For the reasons detailed in Section 3.14, *Public Health and Safety*, those would be **low** impacts under both Alternative 1 and Alternative 2 and both full and 50% production options.

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Chapter 4

# Environmental Consultation and Coordination

Numerous federal, state, and local environmental laws, administrative requirements and plans are reviewed as part of the Bonneville Power Administration's (BPA) National Environmental Policy Act analysis. This chapter describes the Crystal Springs Hatchery Program's (Hatchery Program) compliance and consistency with these laws, requirements, and plans.

## 4.1 Federal Laws, Regulations, and Executive Orders

### 4.1.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA), as amended (U.S. Code [U.S.C.], Title 42, 4321 *et seq*.), requires federal agencies to assess and disclose the effects of proposed actions on the environment before making a decision to proceed. This Environmental Impact Statement (EIS) has been prepared to meet BPA's NEPA requirements. The U.S. Forest Service (USFS) and National Marine Fisheries Service (NMFS) may choose to adopt this analysis to meet their respective NEPA requirements.

BPA, the Shoshone-Bannock Tribes (Tribes), and USFS conducted scoping meetings with interested and potentially affected parties and provided other opportunities to contribute to the development of the draft EIS. Various individuals, agencies, and organizations identified issues to be considered in the environmental analysis (see Chapter 1, Section 1.8, *Public Involvement and Scoping*, and Appendix A). This draft EIS will be sent to regulatory agencies and other interested organizations and individuals for review and comment (see Chapter 7, *List of Agencies, Organizations, and Persons Contacted*). Once the formal public comment period on the draft EIS ends, BPA will consider all comments and make additions, corrections, or clarifications to the analysis for the final EIS. BPA will document its final decision in a Record of Decision after the final EIS has been issued.

### 4.1.2 Northwest Power Act

Provisions of the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 *et seq.*) are intended to protect, mitigate, and enhance fish and wildlife of the Columbia River and its tributaries.

The Northwest Power and Conservation Council (called the Northwest Power Planning Council until 2003) has eight members, two from each state, appointed by the governors to three-year terms. The Council's headquarters is located in Portland, Oregon. Consistent with the Northwest Power Act, the Council's power plan and fish and wildlife program are implemented by BPA.

### 4.1.3 Clean Water Act

The Clean Water Act (CWA) of 1972 (33 U.S.C. 1251 *et seq*.) establishes the basic structure for regulating discharges of pollutants into waters of the United States and for developing and implementing surface water quality standards (EPA 2014). It is unlawful under the CWA to discharge any pollutant into navigable waters unless a permit is obtained.

Water resources present in the analysis area for the Hatchery Program include wetlands, excavated ponds, McTucker Creek, Yankee Fork, Panther Creek, and Dummy Creek. As currently designed, the Proposed Action would require permits under the CWA for the discharge of potential pollutants into many of these waters, including fill material to construct the weir facilities, and stormwater and wastewater from hatchery operations. See Section 3.5, *Groundwater and Surface Water Quality and Quantity*, for additional information.

The following sections describe regulations under the CWA that apply to the Hatchery Program, including Sections 401, 402, and 404.

#### 4.1.3.1 Section 401, Water Quality Certification

Section 401 of the CWA (33 U.S.C. 1251) requires that a Water Quality Certification be obtained for activities requiring a federal permit or license to discharge any pollutant into a water of the United States. This certification attests that the proposed discharge will not violate state or Tribal water quality standards. The CWA directly grants all state authority over the Section 401 certification program, pending program approval from the U.S Environmental Protection Agency (EPA). In Idaho, the CWA Section 401 program is administered by the Idaho Department of Ecology. The Idaho Department of Ecology would review the Proposed Action's Section 401 and Section 404 permit applications for compliance with Idaho water quality standards and grant Section 401 certification if the permits comply with these standards.

#### 4.1.3.2 Section 402, National Pollutant Discharge Elimination System

Section 402 of the CWA (33 U.S.C. 1342) requires all facilities that discharge potential pollutants to waters of the United States through a point source to obtain a permit under the National Pollutant Discharge Elimination System (NPDES). An NPDES permit contains specific limits on the types and concentrations of pollutants that can be discharged, as well as other conditions designed to ensure that the discharge does not harm water quality or public health. In Idaho, the NPDES program is administered by EPA, with the state providing certification that the permits issued by EPA meet state water quality standards through their Section 401 Water Quality Certification Program (see Section 4.1.3.1, *Section 401, Water Quality Certification*).

If constructed, all three of the proposed facilities for the Hatchery Program would require the discharge of stormwater runoff and wastewater from the rearing and settling ponds into waters of the United States. Consequently, NPDES permits would be required for the Proposed Action. The hatchery facility has been designed to meet the discharge limits of EPA's *NPDES General Permit for Aquaculture Facilities in Idaho subject to Wasteload Allocations under Selected Total Maximum Daily Loads* (Idaho NPDES General Permit No. 130000; EPA 2007). Similar permits may be required for the weir facilities.

EPA, Region 10, has a general permit for federal facilities for discharges from construction activities. The Tribes would issue a Notice of Intent to obtain coverage under this general permit, and prepare a Stormwater Pollution Prevention Plan to address stabilization practices, structural practices, stormwater management, and other controls.

### 4.1.3.3 Section 404, Wetlands and Other Waters of the United States

Section 404 of the CWA (33 U.S.C. 1344) regulates the placement of dredged or fill material into waters of the United States, including special aquatic sites such as sanctuaries and refuges, wetlands, mudflats, vegetated shallows, coral reefs, and riffle and pool complexes. Section 404 is administered by the U.S. Army Corps of Engineers, with oversight from EPA.

The Proposed Action would require placement of fill material into Yankee Fork, Panther Creek, and Dummy Creek to construct the bridge-mounted weirs, intake structures, and outfalls. Consequently, a CWA Section 404 permit would be required. The type of permit needed would depend on the area and volume of fill to be placed and the type of water (e.g., wetland, stream) that would be affected.

## 4.1.4 Floodplains and Wetlands

### 4.1.4.1 Executive Orders 11988 and 11990

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), Executive Order 11988, *Floodplain Management*, and Executive Order 11990, *Protection of Wetlands*. Impacts on and mitigation for streams, floodplains, and wetlands are discussed in Section 3.6, *Wetlands and Floodplains*, of this EIS.

#### Executive Order 11988, Floodplain Management

Executive Order 11988 (42 CFR 26951) requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

There are no Federal Emergency Management Agency (FEMA)-designated 100-year flood inundation zones (or floodplains) affected by the Proposed Action; however, facilities proposed under Alternative 1 at both Yankee Fork and Panther Creek would be sited within areas identified as likely to be inundated by a 100-year flood, based on local geomorphic indicators and available hydrologic records. The proposed weir structures would be constructed in these floodplains, but are not likely to affect floodway capacity or otherwise alter flood behavior in the affected streams. Alternative 2 and the No Action Alternative do not propose any activities affecting floodplains.

#### Executive Order 11990, Protection of Wetlands

Executive Order 11990 (42 CFR 26961) requires federal agencies to follow avoidance, mitigation, and preservation procedures and to obtain public input before proposing new construction in wetlands. Consistency with the overall wetlands policy contained in Executive Order 11990 is achieved through CWA Section 404 compliance requirements and the U.S. Army Corps of Engineers' preparation of the 404(b) (1) alternatives analysis.

Alternative 1 proposes 85 square feet of wetland fill at the Crystal Springs hatchery and 10 square feet of wetland fill at the Panther Creek weir facility, and Alternative 2 proposes 85 square feet of wetland fill at the Crystal Springs hatchery and no wetland fill at the Panther Creek weir facility. The Yankee Fork weir facility will have no wetland fill under either Alternative 1 or Alternative 2. The

No Action Alternative does not propose any wetland fill. Impacts on wetlands would be mitigated by site revegetation using appropriate native plant materials.

#### 4.1.4.2 National Flood Insurance Program

The National Flood Insurance Program (NFIP) is a federal floodplain management program designed to reduce future flood losses nationwide through the implementation of community-enforced building and zoning ordinances, in return for the provision of affordable, federally backed flood insurance to property owners (FEMA 2011). NFIP is administered by FEMA, a component of the U.S. Department of Homeland Security. For the most part, NFIP is a voluntary program available to cities, towns, or counties who choose to participate based on an assessment of their site-specific flood hazards.

For communities involved in NFIP, FEMA typically conducts a detailed engineering study, known as a Flood Insurance Study, to determine the flood hazards in a particular area. The flood hazard areas identified in the study are mapped on a Flood Insurance Rate Map (FIRM) for the community. FIRMs typically show the base flood elevations (if determined), floodplain boundaries, a series of insurance risk zones, and any special flood hazard areas.[1] FIRMs may also show areas of moderate and minimal flood hazards, and the limits of the regulatory floodway.[2] Participating communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations.

Bingham, Custer, and Lemhi Counties all participate in the NFIP (FEMA 2015). Development within floodplains is regulated on the local level in each of these counties (see Section 4.2.10, *County-Level Flood/Floodplain Ordinances*).

### 4.1.5 Wildlife and Habitat

#### 4.1.5.1 Endangered Species Act

The Endangered Species Act of 1973 (ESA) and its amendments (16 U.S.C. 1531 *et seq*.) establish 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 the U.S. Fish and Wildlife Service (USFWS) for terrestrial species and some freshwater fish species, and by the National Marine Fisheries Service (NMFS) 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 their critical habitats. The effects on species listed under the ESA are discussed in Chapter 3 of this EIS (see Section 3.7, *Fish*, and Section 3.8, *Wildlife*). Based on the information in these sections, a biological assessment will be submitted to

[1] Special flood hazard areas are high-risk areas that include lands that would be inundated by a flood having a 1% chance of occurring in a given year, which is also referred to as the base flood or 100-year flood.

[2] Moderate flood hazard areas are defined as those areas located between the limits of the base flood and the 0.2%-annual-chance (or 500-year) flood. Minimal flood hazard areas are those areas located above the elevation of the 0.2% annual-chance flood. The regulatory floodway is defined as the channel of a river or other watercourse, and the portion of the floodplain outside the channel banks, that must be kept free from encroachment so that water from the base flood may pass through without increasing the flood level of the 100-year flood by more than 1 foot.

USFWS and this EIS and two Hatchery and Genetic Management Plans for the proposed Hatchery Program will be submitted to NMFS for formal consultation under Section 7 of the ESA.

### 4.1.5.2 Fish and Wildlife Coordination Act and Fish and Wildlife Conservation Act

The Fish and Wildlife Coordination Act of 1934, as amended (16 U.S.C. 661 *et seq*.), requires federal agencies to coordinate with USFWS and state fish and game agencies whenever "waters of any stream or other body of water are proposed or authorized, permitted, or licensed to be impounded, diverted…or otherwise controlled or modified" by permit or license. USFWS and the Idaho Department of Fish and Game will be sent copies of the draft EIS. BPA and the Tribes are coordinating with these agencies on many issues related to construction and operation of the Hatchery Program, including construction work windows, mitigation measures, and program management criteria.

The Fish and Wildlife Conservation Act of 1980, as amended (16 U.S.C. 2901 *et seq.*), encourages federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats. The Hatchery Program is designed to restore spring/summer-run Chinook salmon in areas from which it had been extirpated, and to contribute to the ecological balance of the Salmon River basin by providing a source of nutrients to other species.

### 4.1.5.3 Migratory Birds

#### Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1936, as amended (16 U.S.C 703-712), prohibits the taking, killing, or possession of migratory birds, their nests, or their eggs, except as allowed by the Secretary of the Interior. The list of migratory birds is found in the Code of Federal Regulations, Title 50, Section 10 (50 CFR 10), and permit regulations are found in 50 CFR 21. The Hatchery Program would not result in the take, kill, or possession of migratory birds.

#### Executive Order 13168, Responsibilities of Federal Agencies to Protect Migratory Birds

Executive Order 13186, issued in January 2001, directs each federal agency undertaking actions that may negatively impact migratory bird populations to work with USFWS to develop an agreement to conserve those birds. The protocols developed by this consultation are intended to guide future agency regulatory actions and policy decisions; renewal of permits, contracts, or other agreements; and the creation of or revisions to land management plans. This order also requires that the environmental analysis process include effects of federal actions on migratory birds. On August 3, 2006, USFWS and the U.S. Department of Energy signed a Memorandum of Understanding to complement the Executive Order. BPA (through the U.S. Department of Energy) and USFWS have a Memorandum of Understanding to address migratory bird conservation, which addresses how BPA and USFWS can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

### 4.1.5.4 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), prohibits the taking, possession, purchase, sale, barter, transport, export, or import of any bald or golden eagle or any part, nest, or egg of a bald or golden eagle, except for certain scientific, exhibition, and religious purposes. The Bald and Golden Eagle Protection Act specifically covers intentional acts or acts in "wanton disregard" of the safety of bald or golden eagles. Neither bald eagles nor golden eagles would be taken or otherwise harmed by the Hatchery Program. The most likely effect would be beneficial, by increasing a source of food for bald eagles (i.e., spring/summer-run Chinook salmon and Yellowstone cutthroat trout).

### 4.1.5.5 Magnuson-Stevens Fishery Conservation and Management Act

NMFS is responsible for ensuring compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended (16 U.S.C. 1801 *et seq.*), which establishes requirements for evaluating and consulting on adverse effects on essential fish habitat (EFH). EFH includes all streams, lakes, ponds, wetlands, and other viable water bodies, and most of the habitat historically accessible to Chinook salmon necessary for spawning, breeding, feeding, or growth to maturity. The facilities associated with the Hatchery Program are located in EFH for Chinook salmon. Section 3.4, *Fish*, discusses effects of the Proposed Action and alternatives on fish habitat, including EFH for Chinook salmon.

### 4.1.5.6 Plant Protection Act

The Plant Protection Act (7 U.S.C. 7701 *et seq*.), administered by the U.S. Department of Agriculture through the Animal and Plant Health Inspection Service, consolidates the major statutes pertaining to plant protection and quarantine in the United States (USFWS 2012). It includes the previously enacted Federal Noxious Weed Act of 1974, which established a federal program to control the spread of noxious weeds in the United States. A 1990 amendment to the Federal Noxious Weed Act increased federal responsibility for noxious weed control by requiring each of the federal-land management agencies (Bureau of Land Management, National Park Service, USFWS, and USFS) to designate, establish, and fund noxious weed management programs on their lands. The amendment also required these agencies to implement cooperative agreements with the states for noxious weed management on federal land and to establish integrated management systems to control and contain the species identified in these agreements.

The Animal and Plant Health Inspection Service is tasked with using science-based methods to prevent the introduction of parasitic-plant pests and noxious weeds into the United States through the exclusion, detection, and eradication of introduced plant species that pose the highest risk to national agricultural practices (U.S. Department of Agriculture 2015). The Animal and Plant Health Inspection Service maintains the Federal Noxious Weed List, which lists noxious weeds that are subject to restrictions on interstate movement.

### 4.1.5.7 Executive Order 13112, Invasive Species

Executive Order 13112 (64 CFR 6183) directs that all federal agencies who authorize, fund, or carry out actions that may affect the status of invasive species use relevant programs and authorities to prevent the introduction of invasive species and provide for their control. It also directs these agencies to not authorize or carry out actions that are likely to cause the introduction or spread of invasive species unless the agency has determined and provided public documentation that shows the benefits of such actions clearly outweigh the potential harm, and all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

## 4.1.6 U.S. Forest Service Forest Plans and Special Use Permits

### 4.1.6.1 National Forest Management Act

The National Forest Management Act of 1976 (16 U.S.C 1600 *et seq*.) is the primary statute governing the administration of national forests, and requires each national forest and grassland to develop a Land and Resource Management Plan to administer the management of renewable resources on national forest lands.

In order to assess the effectiveness of management activities implemented under these plans on fish and wildlife populations, the National Forest Management Act requires USFS to identify management indicator species (wildlife and plant species that are indicators of ecosystem health and resource management success). Management indicator species typically include endangered and threatened plant and animal species identified on state and federal lists; species with special habitat needs; species commonly hunted, fished, or trapped; non-game species of special interest; and additional plant or animal species selected because their population changes are believed to indicate the effects of management activities on other species of selected major biological communities or on water quality.

The Yankee Fork and Panther Creek weir facilities, which would be used to capture and spawn Chinook salmon broodstock, are located on USFS-administered lands in the Salmon-Challis National Forest. In order for USFS to approve (or deny) the special use permits for these proposed facilities, USFS must understand the potential effects of these management activities on management indicator species and their habitats. An evaluation of impacts of the Proposed Action and alternatives on management indicator species for vegetation, fish, and wildlife are discussed in Section 3.4, *Vegetation*; Section 3.7, *Fish*; and Section 3.8, *Wildlife*, respectively.

### 4.1.6.2 Challis National Forest and Salmon National Forest Land and Resource Management Plans

Land and Resource Management Plans at the National Forest level outline specific goals and objectives for USFS managers. The Challis National Forest Land and Resource Management Plan covers the Yankee Fork weir facility (USFS 1987). The Salmon National Forest Land and Resource Management Plan covers the Panther Creek weir facility (USFS 1988). Both were adopted in the late 1980s and have been amended by USFS several times since; the most recent amendment was in 2004 (USFS 2004a; USFS 2004b).

### 4.1.6.3 Forest Service Manual

The Forest Service Manual (FSM) contains legal authorities, objectives, policies, responsibilities, instructions, and guidance needed on a continuing basis by USFS line officers and primary staff in more than one unit to plan and execute assigned programs and activities. The following titles from the FSM apply to the visual quality of the analysis area for the Hatchery Program.

1. FSM 1020.21. "The mission of the Forest Service is to sustain the health, diversity, and productivity of the Nation's forest and grasslands to meet the needs of present and future generations."
2. FSM 2330.3. Establish priorities for the development and management of sites in the following order:
    a. Ensure public health and safety.
    b. Protect the natural environment of the site.
    c. Manage and maintain sites and facilities to enhance users' interaction with the natural resource.
    d. Provide new developments that conform to the National Forest System recreation role.
3. FSM 2380.3.1. It is Forest Service policy to: Inventory, evaluate, manage, and, where necessary, restore scenery as a fully integrated part of the ecosystems of National Forest Service lands and of the land and resource management and planning process.
4. FSM 2380.43.4-5. "Conduct and document a scenery assessment for all activities that may affect scenic resources and that require analysis under the National Environmental Policy Act. Ensure application of the principles of landscape aesthetics, scenery management, and environmental design in project-level planning."

### 4.1.6.4 National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers Act (Public Law 90-542, 16 U.S.C. 1271 *et seq*.) was enacted by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreation values in free-flowing condition for the enjoyment of present and future generations (National Wild and Scenic River System 2015). The Wild and Scenic Rivers Act establishes criteria for designating rivers as *wild*, *scenic*, or *recreational*[3] and provides a framework for agencies responsible for managing a river to evaluate the effects on water resources under Section 7 of the Wild and Scenic Rivers Act.

[3] As defined in 16 U.S.C. 1273(b), wild river areas are river sections that are free from impoundments and generally only accessible by trail, with watershed or shorelines essentially primitive and waters unpolluted; scenic river areas are those with similar natural features but that are accessible by road; and recreational river areas are those segments accessible by road or railroad that may have some shoreline development and that may have been affected by past impoundment and/or diversion activities.

Section 7 addresses restrictions on Federal Energy Regulatory Commission licensing of hydroelectric projects and other federally assisted (e.g., licensed, permitted, funded) water resource development projects[4] on designated rivers. It also includes provisions for projects proposed below, above, or on a stream tributary to designated rivers. For such projects, Section 7(a) requires a detailed evaluation of the project's potential to "invade or unreasonably diminish" the scenic, recreational, fish, or wildlife values of the designated river. A Section 7(a) Determination must be prepared for the project by the administering agency before the federal license/permit/funding can be issued.

Both Panther Creek and the Yankee Fork of the Salmon River have been determined by USFS to be eligible for designation under the Wild and Scenic Rivers Act. Appendix D of this EIS provides the effects analysis associated with the Wild and Scenic Rivers Act and crosswalks this analysis with the applicable sections in the EIS.

### 4.1.7 National Historic Preservation Act

The National Historic Preservation Act of 1966, as amended (16 U.S.C 470 *et seq*.), requires federal agencies to take into account the potential effects of their undertakings on properties that are listed or eligible for listing on the National Register of Historic Places. Implementing regulations at 36 CFR Part 800 require that federal agencies consult with the State Historic Preservation Office, affected Indian tribes, and additional parties regarding the inventory and evaluation of properties potentially eligible for inclusion on the National Register of Historic Places. As part of this process, federal agencies also determine whether the project would adversely affect these properties within the project area.

BPA has provided information about the Proposed Action to, and requested input on the level and type of proposed identification and evaluation efforts of cultural resources from, the Idaho State Historic Preservation Office and the following tribes: Nez Perce Tribe, Fort McDermitt Paiute-Shoshone Tribe, Shoshone-Bannock Tribes of the Fort Hall Reservation, and the Shoshone-Paiute Tribes of the Duck Valley Reservation.

BPA also complies with other laws and directives for the management of cultural resources, including:

- Antiquities Act of 1906 (16 U.S.C. 431–433).
- Historic Sites Act of 1935 (16 U.S.C. 461–467).
- Archaeological Data Preservation Act of 1974 (16 U.S.C. 469 a–c).
- Section 106 of the National Historic Preservation Act (16 U.S.C. 470 *et seq*.), as amended.
- National Register of Historic Preservation (16 U.S.C. 470a).

[4] A water resource project is defined under 36 CFR 297.3 to include any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the Federal Power Act (41 Stat. 1063) as amended, or other construction of developments that would affect the free-flowing characteristics of a Wild and Scenic River or Study River. Supplemental guidance from the Wild and Scenic Rivers Coordinating Council states that water resource projects can also include dams; water diversion projects; fisheries habitat and watershed restoration/enhancement projects; bridges and other roadway construction/reconstruction projects; bank stabilization projects; channelization projects; levee construction; recreation facilities such as boat ramps and fishing piers; and activities that require a CWA, Section 404 permit from the U.S. Army Corps of Engineers (Wild and Scenic Rivers Coordinating Council 2004).

- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470 *et seq*.), as amended.
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq*.).
- Executive Order 13007 Indian Sacred Sites.
- American Indian Religious Freedom Act of 1978 (PL 95-341, 92 Stat. 469, 42 U.S.C. 1996, 1996a).

## 4.1.8 Farmland Protection Policy Act

The Farmland Protection Policy Act minimizes the impacts that federal programs have on unnecessary and irreversible conversion of farmland to nonagricultural land use. The act is used to assure that, to the greatest extent possible, federal programs are administered to be compatible with state and local units of government, and private programs and policies to protect farmland (Natural Resources Conservation Service n.d.).

## 4.1.9 Clean Air Act

The Clean Air Act (42 U.S.C. 1857 *et seq*.), as amended and recodified (42 U.S.C. 7401 *et seq*.), was enacted to protect and enhance the nation's air quality in order to promote public health and welfare and the productive capacity of the nation's population. The Clean Air Act is the primary federal legislation that addresses air quality, and provides the authority for most federal and many state programs to improve air quality. The Clean Air Act requires an evaluation of any federal action to determine its potential impact on air quality in the project region. The objective behind the Clean Air Act is to reduce air pollution levels. As a result, the federal government and state agencies have passed legislation and established regulatory programs to control sources of emissions.

The following sections describe air quality standards, the reporting of greenhouse gases, and draft guidance on greenhouse gas emissions.

### 4.1.9.1 National Ambient Air Quality Standards

The National Ambient Air Quality Standards (40 CFR 50) are federal standards established by EPA under the Clean Air Act. The standards set the allowable concentrations of common pollutants in the outdoor air to protect human health and welfare.

### 4.1.9.2 Mandatory Reporting of Greenhouse Gases

The EPA Rule on Mandatory Reporting of Greenhouse Gases (40 CFR Part 98) requires facilities that emit 25,000 metric tons or more per year of greenhouse gases to report emissions data annually to EPA. The reporting system is intended to collect accurate and timely emissions data to guide development of sound policies and programs to reduce emissions. Section 3.11, *Air Quality and Climate Change*, shows that greenhouse gas emissions associated with the Proposed Action and action alternatives would be well below the reporting threshold of 25,000 metric tons per year and, therefore, reporting to EPA is not required.

### 4.1.10 Federal Noise Control Act

The Federal Noise Control Act of 1972 (Public Law 92 574) established a requirement that all federal agencies administer their programs to promote an environment free of noise that would jeopardize public health or welfare (EPA 2015d). EPA was given the responsibility for the following.

- Providing information to the public regarding identifiable effects of noise on public health and welfare.
- Publishing information on the levels of environmental noise that will protect public health and welfare with an adequate margin of safety.
- Coordinating federal research and activities related to noise control.
- Establishing federal noise emission standards for selected products distributed in interstate commerce.

As part of its responsibility, EPA published "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" in 1974 (EPA 1974). This report identifies sound levels less than or equal to 55 $L_{dn}$ as being appropriate outdoors for residential areas and other places where quiet is necessary to avoid annoyance and interference with outdoor activity.

### 4.1.11 Resource Conservation and Recovery Act, Toxic Substances Control Act, and Federal Insecticide, Fungicide, and Rodenticide Act

The Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*) is intended to give authority to EPA for the control of hazardous waste from the generation, transportation, treatment, storage, and disposal of these materials (EPA 2015e).

The Toxic Substances Control Act of 1976 (15 U.S.C. 2601 *et seq.*) provides EPA with authority to require reporting, record keeping and testing requirements, and restrictions that relate to chemical substances and/or mixtures (EPA 2015f).

The Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136(a-y)) provides federal regulation on distribution, sale, and use of pesticides. All pesticides distributed or used in the United States must be registered by EPA (EPA 2015g).

### 4.1.12 Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance

Executive Order 13514 directs federal agencies to set a 2020 greenhouse gas emissions reduction target within 90 days; increase energy efficiency, reduce fleet petroleum consumption, conserve water, and reduce waste; support sustainable communities; and leverage federal purchasing power to promote environmentally responsible products and technologies.

### 4.1.13 Executive Order 12898, Federal Actions to Address Environmental Justice

Executive Order 12898 (59 CFR 7629), Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994), directs each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (59 CFR 7629). The environmental justice process is a means to better understand the distribution of effects across an area, with an emphasis on their distribution among minority and low-income populations. Federal agencies must ensure that federal programs or activities do not directly or indirectly result in discrimination on the basis of race, color, or national origin.

## 4.2 State and Local Laws, Regulations, and Plans

### 4.2.1 Idaho Administrative Code

The Idaho Administrative Code includes the rules of the Idaho Department of Environmental Quality (2015), which is the department of the Idaho state government responsible for administration of state and federal environmental laws and regulations. Idaho Administrative Code 58.01.01 are rules that provide for the control of air pollution in Idaho, including air quality permitting requirements and emission limits. Idaho Administrative Code 58.01.02 are rules that safeguard the quality of the waters of the state, including the enforcement of standards relating to the discharge of effluent into the waters of the state.

### 4.2.2 Idaho Stream Channel Protection Act

The purpose of the Idaho Stream Channel Protection Act (Title 42, Chapter 38, Idaho Code) is to protect the fish and wildlife habitat, aquatic life, recreational resources, aesthetic beauty, and water quality of the state by regulating the alteration of stream channels.[5] Anyone who wishes to alter a stream channel of the state must obtain a Stream Channel Alteration Permit from the Idaho Department of Water Resources. Permits are obtained by filing a joint-agency stream alteration permit application with the Idaho Department of Water Resources, the Idaho Department of State Lands, and the U.S. Army Corps of Engineers (Idaho Administrative Procedures Act, 7.03.07, Stream Channel Alteration Rules).

Construction of both the Yankee Fork and Panther Creek weir facilities would require the excavation of the streambed and placement of concrete and other materials below the mean ordinary high water mark to construct the bridge-supported weirs, fish ladders, and intake structures proposed at these sites. Streamflow would also be temporarily diverted at each site to facilitate in-water construction work. Because these activities would alter the stream channel and flow in these

[5] Stream channels are defined as natural watercourses of perceptible extent that exhibit defined beds and banks that confine continuously flowing water (Idaho Code 42-3802[d]). Alteration is defined as any action that obstructs, diminishes, destroys, modifies, relocates, or changes the natural existing shape or direction of water flow below the mean high water mark (Idaho Code 42-3802[b]).

locations, Stream Channel Alteration Permits would be required for the Proposed Action at these sites.

### 4.2.3 Idaho Water Appropriations Rules

An aquaculture (hatchery) facility must obtain a water right from the Idaho Department of Water Resources to divert or appropriate water for fish propagation. The Tribes currently have a 24.7 cubic feet per second water right for the groundwater that would provide water for the proposed Crystal Springs hatchery; therefore, the Tribes are fully permitted for the necessary groundwater needed to operate the hatchery. A preliminary review of water rights indicates the existing water right is designated for beneficial use on the eastern parcel only and would be used to supply water to the hatchery. Water use by residences proposed for construction on the northern parcel would require a formal water right transfer or new water right. Residential use is considered a non-consumptive use by the Idaho Department of Water Resources (Idaho Administrative Procedures Act, 37.03.08, Water Appropriation Rules).

Operations at the Yankee Fork and Panther Creek weir facilities (once approved) will require the Tribes to obtain water right permits to divert a non-consumptive use of water for each facility.

### 4.2.4 Idaho Comprehensive Wildlife Conservation Strategy

The Idaho Department of Fish and Game has implemented a Comprehensive Wildlife Conservation Strategy with the goals of sustaining fish and wildlife and their habitats; ensuring the long-term survival of native wildlife, fish, and plants; and increasing the capacity of the habitats to support these species. Under the Comprehensive Wildlife Conservation Strategy, the state has developed a list of the Species of Greatest Conservation Need (Idaho Department of Fish and Game 2005).

### 4.2.5 Idaho State Noxious Weed Control Law

The Idaho State Noxious Weed Control Law (22 Idaho Code 24 *et seq.*) sets forth the definitions, legal requirements, and responsibilities of state and county personnel and landowners for the control of noxious weeds in the state. Under this law, noxious weeds are defined as any plant having the potential to cause injury to public health, crops, livestock, land, or other property, as designated by the Directory of the Idaho State Department of Agriculture (24 Idaho Code 22-2402[15]). Landowners are required to control noxious weeds on their land and property in accordance with this law and with the rules promulgated by the Director in Title 6, Chapter 22 of the Idaho Administrative Procedures Act.

Lists of state-designated noxious weeds are contained in Idaho Administrative Procedures Act 02.06.22.100. Three statewide noxious weed lists are maintained by the Idaho State Department of Agriculture, *Early Detection and Rapid Response*, *Control*, and *Containment*.

- Weeds on the *Early Detection and Rapid Response* list are those that are in the initial stages of colonization in the state. Occurrences of such species must be reported to the Idaho State Department of Agriculture within 10 days of detection and must be eradicated during the same growing season as identified.
- Weeds on the *Control* list are known to exist in varying populations throughout the state at concentrations where control and eradication may still be possible. For such weeds, the relevant control authority must prepare a written control plan that specifies the active control

methods that will be implemented to reduce known populations within not more than five years.

- Weeds included on the *Containment* list are known to exist in various populations throughout the state but are too extensive to be eradicated completely. Control efforts are focused on reducing or eliminating new or expanding populations and managing the spread of known and established populations.

### 4.2.6 Bingham County Comprehensive Plan

The Bingham County Comprehensive Plan guides the development of the county based on goals across 14 elements. The county must address these planning elements to comply with Idaho's Local Planning Act (State of Idaho 2016), the enabling legislation for local planning in Idaho. The Bingham County Comprehensive Plan provides the framework within which decisions about zoning and permitting are made. Bingham County adopted its most recent Comprehensive Plan in 2005 (Bingham County 2005).

### 4.2.7 Bingham County Zoning Ordinance

The Bingham County Zoning Ordinance, most recently adopted in 2012, outlines standards for orderly development in accordance with Idaho law. Among other objectives, Bingham County's zoning ordinance stipulates allowable uses for land in different zoning classes (Bingham County 2012).

### 4.2.8 Bingham County Building Code

Bingham County adopted the 2012 Edition of the International Building Code by reference in Ordinance No. 2014-01. Appendix J of the International Building Code includes provisions for grading activities, including the requirement for the issuance of grading permits by the county building official. As part of the grading permit application process, applicants are required to submit erosion control plans for review and approval by the County's Building Division. Such plans must typically include provisions for the revegetation of disturbed areas with native vegetation following completion of construction.

### 4.2.9 Lemhi County Comprehensive Plan

The Lemhi County Comprehensive Plan, adopted in 2007, includes among its goals for limiting land use conflicts the need to protect existing residential areas from excessive noise from incompatible commercial and industrial use of the land. The Lemhi County Development Code, adopted in 2009, includes performance standards for noise, specifically that noise levels should not exceed 70 A-weighted decibels for more than 10% of a given hour at residences, lodging facilities, public meeting rooms, schools, libraries, hospitals, parks, and similar uses (Lemhi County 2007).

### 4.2.10 County-Level Flood/Floodplain Ordinances

Floodplains in Custer and Lemhi Counties are regulated in accordance with the Flood Damage Prevention Ordinance (Custer County Ordinance No. 2014-01) in Custer County and the Special Flood Hazard Area Overlay Zoning District (Lemhi County Development Code, Chapter 9) in Lemhi

County. Both of these ordinances identify *areas of special flood hazard*[6] and set forth the minimum development requirements for work in such areas. These ordinances also regulate activities in the floodway and the alteration of watercourses (e.g., streams, rivers). Under both of these ordinances, anyone wishing to develop in a special flood hazard area in these counties must obtain a Floodplain Development Permit from the local planning department and meet the development standards set forth in the respective flood ordinances. Projects located outside of mapped areas of special flood hazard that involve alteration of a regulatory floodway or watercourse require an encroachment analysis and certification by a licensed professional engineer that the project will not cause a rise in flood heights (i.e., a No-Rise Certification) or diminish the bankfull flood carrying capacity of the affected watercourse.

The Proposed Action for the Hatchery Program would require the alteration of both the Yankee Fork and Panther Creek channels to construct the bridge-supported weirs and intake structures. Consequently, certification that the Proposed Action would not diminish the bankfull flood carrying capacity of the channel could be required by both Custer and Lemhi Counties. The Proposed Action could also include the placement of structures in the floodway at both of these sites. If so, a No-Rise Certification could also be required.

[6] *Areas of special flood hazard* are defined as lands in the floodplain that are subject to a 1% or greater chance of flooding in any given year and are equivalent to Special Flood Hazard Areas identified by FEMA. The boundaries of these areas are defined based on FEMA flood insurance studies conducted for these counties in 1988 (Custer County) and 1990 (Lemhi County) and their accompanying FIRMs.

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Chapter 5
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# Personal Communications

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D.J. Warren and Associates, Inc. July 1, 2016—memorandum to Danny Stone, Shoshone-Bannock Tribes, regarding consistency of the EIS, Master Plan, and Step 2/3 submittal, and alternative for the 50% production option.

Davis, Jake. Access Specialist, Road and Bridge. Lemhi County. April 16, 2015—telephone communication with ECONorthwest.

Davis, Leigh Ann. Planner. Bingham County. March 24, 2015—telephone communication.

De Grado, Donna. Owner, Pioneer Motel and RV Park, Challis, Idaho. April 2, 2015—telephone communication.

Deschaine, Dave. Forest Hydrologist. Salmon-Challis National Forest, U.S. Forest Service. Information on flow in Panther Creek. March 30, 2015—email communication with Matthew Kuziensky, Senior Wetland Scientist, ICF International.

Dize, Ken. General Manager, Salmon River Electricity Cooperative. February 16, 2016—telephone communication with ECONorthwest regarding power source for Yankee Fork site.

Garcia, Dan. North Zone Districts Fishery Biologist. U.S. Forest Service, Region 4, Salmon-Challis National Forest. October 2014—email communication (submittal of unpublished data) with Grant Novak, Fishery Biologist, ICF International.

Gohn, Lisa. Owner, Blue Mountain Refuse. February 16, 2016—telephone communication.

Haggas, Lucinda. North Zone Wildlife Program Manager. Salmon-Challis National Forest, Salmon-Cobalt Ranger District, U.S. Forest Service, Salmon, ID. February 25, 2015—email submission of data.

Jensen, Boyd. Road and Bridge. Bingham County. April 16, 2015—email communication with ECONorthwest.

Lanier, Melvin. Supervisor, Road and Bridge. Custer County. April 16 and April 30, 2015—telephone communication with ECONorthwest.

Libertine, Ellen. Chamber Coordinator, Stanley-Sawtooth Chamber of Commerce. February 24, 2016—telephone communication.

Monson, Richard. Public Works Director, Road and Bridge Office. Bingham County. April 16, 2015—telephone communication with ECONorthwest.

Purvine, Jennifer. Planning Wildlife Biologist. Salmon-Challis National Forest, Challis-Yankee Fork Ranger District, U.S. Forest Service, Challis, ID. March 5, 2015—email submission of data.

Reich, Sarah. ECONorthwest. April 17, 2015—email communication with Jason Volk, ICF International, providing Crystal Springs traffic counts.

Reiser Mark. Senior Project Manager. McMillen Jacobs Associates. March 30, 2015—email communication with Brendan Belby, ICF International, regarding geology and soils.

Reiser, Mark. Senior Project Manager. McMillen Jacobs Associates. May 26, 2015—email communication with Colleen Lingappaiah, Project Manager, ICF International, regarding chemicals proposed to be used at the Crystal Springs Hatchery, Yankee Fork facility, and Panther Creek facility.

Reiser, Mark. Senior Project Manager. McMillen Jacobs Associates. June 8, 2015—email communication with Colleen Lingappaiah, Project Manager, ICF International, regarding proposed power use at Yankee Fork and Panther Creek Facilities.

Reiser, Mark. Senior Project Manager. McMillen LLC. April 16 and April 17, 2015—email and telephone communication with ECONorthwest.

Reiser, Mark. Senior Project Manager. McMillen, LLC. April 1, 2015—email communication with Matthew Kuziensky, Senior Wetland Scientist, ICF International, regarding operation of proposed weir panels.

Reiser, Mark. Senior Project Manager. McMillen Jacobs Associates. April 3, 2015—email communication with Brendan Belby, ICF International, regarding geology and soils.

Reiser, Mark. Senior Project Manager. McMillen Jacobs Associates. April 22, 2015—email communication with Brendan Belby, ICF International, regarding geology and soils.

Reiser, Mark. Senior Project Manager. McMillen Jacobs Associates. January 27, 2016—email communication with Brendan Belby, ICF International, regarding geology and soils.

Robertson, Cheryl. GIS Technician. Bingham County. March 10, 2015—telephone communication.

Rowland, Craig, Sheriff. Bingham County Sheriff's Office. April 2, 2015—email communication.

Schoby, Greg. Regional Fisheries Biologist, Idaho Department of Fish and Game (IDFG). March 11, 2015—telephone communication.

Schuldt, Pete. Road Manager. Salmon Challis National Forest. April 27 and April 30, 2015—email and telephone communication with ECONorthwest.

Stone, Daniel. Policy Analyst Shoshone-Bannock Tribes, Department of Fish and Wildlife. February 29, 2015—email communication with Brendan Belby, ICF International, regarding geology and soils.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. March 16, 2015—email communication with Matthew Kuziensky, Wetland Biologist, ICF International.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. March 9, 2015—email communication with Rick Oestman, ICF International.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. 2015—multiple telephone and email communications with Rick Oestman, RO Consulting, regarding groundwater and surface water quantity.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife—email and telephone communication with ECONorthwest on March 3, March 13, and April 28, 2015 regarding land use and recreation.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. Information regarding operations at Yankee Fork and Panther Creek Facilities under Alternative. April 17, 2015, and May 7, 2015—email and telephone communication with ECONorthwest.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. May 20, 2015—email communication with Colleen Lingappaiah, Project Manager, ICF International, regarding chemicals to be used on site.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. November 23, 2015—email communication with Colleen Lingappaiah, Project Manager, ICF International, regarding current fuel use at Panther Creek, power access at Yankee Fork and Panther Creek, and safety protocols for in-water work.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. December 1, 2015—email communication with Colleen Lingappaiah, Project Manager, ICF

International, regarding local law enforcement, fire protection, and health and medical services for the Crystal Springs, Yankee Fork, and Panther Creek project sites.

Stone, Daniel. Policy Analyst. Shoshone-Bannock Tribes, Department of Fish and Wildlife. March 3, 2015, March 12 2015, March 19, 2015, and April 28, 2015—email and telephone communication.

Tollerup, Marta. Customer Service Representative, Clear Creek Disposal. February 16, 2016—telephone communication.

Viste, Raelene. Roadway Data Section, Idaho Department of Transportation. April 16, 2015—email communication with ECONorthwest.

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# Chapter 6
# List of Preparers and Reviewers

Preparers and reviewers for the Crystal Springs Hatchery Program Environmental Impact Statement (EIS) are listed below alphabetically by last name. Listings include title, organization, EIS contribution, education, and years of experience.

***Joel Ainsworth –*** Associate, ECONorthwest. Technical analysis for socioeconomics. Education: M.S. Applied Economics; B.A. Economics. Years of experience: 4.

***Gail Baer –*** Non-Recreation Special Uses Program Manager, U.S. Forest Service, Salmon-Challis National Forest. Permit administrator and cost recovery case manager. Education: B.S. Forest Management. Years of experience: 30.

***Alan Barnard –*** Senior Graphic Designer, ICF. Graphics production. Education: Advanced training in Adobe Creative Suite. Years of experience: 21.

***Brendan Belby*** – Earth Scientist, ICF. Technical analysis for geology and soils. Education: M.S. Geomorphology. Years of experience: 16.

***Sarah Thompson Biegel*** – NEPA Compliance Officer, Bonneville Power Administration. General NEPA compliance review of the EIS. Education: M.S. Biology, B.S. Biological Sciences. Years of experience: 19.

***Trish Callaghan*** – Recreation Programs Manager, U.S. Forest Service, Salmon-Challis National Forest. Technical review of recreation analysis and recreation-related documents. Education: B.S. Forest Recreation/Forest Management. Years of experience: 31.

***Tim Canaday*** – Forest Archaeological and Tribal Coordinator, U.S. Forest Service, Salmon-Challis National Forest. Technical review of sections on tribal concerns. Education: Ph.D, Anthropology. Years of experience: 35.

***Kevin Cannell*** – Archaeologist, Bonneville Power Administration. Technical review of cultural resources analysis. Education: M.S. Anthropology; B.S. Anthropology. Years of experience: 24.

***Michael Carroll –*** Forest Engineer, U.S. Forest Service, Salmon-Challis National Forest. Technical review of the Draft EIS. Education: M.S. Civil Engineering. Years of experience: 6.

***Melissa Cascella –*** Senior Archaeologist, ICF. Technical evaluation of cultural resources. Education: M.A. Cultural Resources Management. Years of experience: 10.

***Joe DeHerrera*** –Wildlife Biologist, Bonneville Power Administration. Crystal Springs Hatchery Program project manager. Education: B.S. Wildlife Biology. Years of experience: 25.

***Lytle Denny*** – Program Manager, Shoshone-Bannock Tribes, Fish and Wildlife Department. Tribal Anadromous Fisheries Program Manager. Education: M.S. Fisheries Science. Years of experience: 17.

***David Deschaine –*** Watershed Program Lead/Forest Hydrologist, U.S. Forest Service, Salmon-Challis National Forest. Technical review of hydrology components of the EIS analysis, including groundwater and surface water quality, groundwater and surface water quantity and rights, geology and soils, and wetlands and floodplains analyses. Education: M.S. Watershed Science, emphasis in Hydrology; B.S. Watershed Science, emphasis in Hydrology. Years of experience: 14.

***Israel Duran* –** Environmental Protection Specialist, CRGT. Inc. Reviewer of the draft EIS. Education: M.S. Entomology; B.S. Zoology. Years of experience: 15.

***Chris Earle*** – Ecologist, ICF. Natural resources technical lead; senior reviewer of the EIS. Education: Ph.D. Forest Ecology; M.S. Geology. Years of experience: 23.

***J. Tait Elder*** – Principal Investigator for Archaeological Resources, ICF. Archaeological resources lead; technical evaluation for cultural resources. Education: M.S. Anthropology; B.A. Archaeology. Years of experience: 12.

***David Ernst*** – Senior Environmental Specialist, ICF. Technical analysis for air quality and climate change. Education: B.S. Engineering; B.A. Ethics and Politics; MCRP Urban Planning. Years of experience: 36.

***Brett Farman*** – Fisheries Biologist, National Marine Fisheries Service. Reviewed chapters and sections in the EIS related to impacts on fish. Education: B.S. Microbiology. Years of experience: 15.

***Tom Ford*** – Natural Resources Staff Officer, U.S. Forest Service, Salmon-Challis National Forest. Reviewed chapters and sections in the EIS for NEPA compliance. Education: B.S. Forestry. Years of experience: 27.

***Dan Garcia*** – North Zone Districts Fisheries Biologist, U.S. Forest Service, Salmon-Challis National Forest. Technical review of fisheries analysis for Panther Creek. Education: B.S. Wildlife Resource Management, emphasis in Fisheries. Years of experience: 27.

***Bart Gamett*** – South Zone Districts Fisheries Biologist, U.S. Forest Service, Salmon-Challis National Forest. Technical review of fisheries analysis for Yankee Fork. Education: M.S. Fish and Wildlife Management; B.S. Biology. Years of experience: 25.

***Thomas Gionet*** – Natural Resource Specialist, U.S. Forest Service, Salmon-Challis National Forest. Invasive plant program manager; technical review of invasive plants analysis. Education: B.S. Forestry; Recreation Resource Management. Years of experience: 22.

***Lizzie Gooding*** – Senior Analyst, ECONorthwest. GIS analysis for socioeconomics and land use and recreation analyses. Education: B.A. Geography. Years of experience: 2.

***Anthony Ha*** – Publications Specialist, ICF. Document formatting and publication. Education: B.A. English. Years of experience: 11.

***Stephen Hall*** – Wildlife Biologist, ICF. Technical analysis for wildlife. Education: B.S. Wildlife and Wildland Recreation Management. Years of experience: 29.

***Shannon Hatcher* –** Air Quality, Climate Change, and Noise Project Manager, ICF. Technical analysis for air quality and climate change. Education: B.S. Environmental Science; B.S. Environmental Health and Safety. Years of experience: 15.

***Christopher Hetzel* –** Cultural Resources Manager/Sr. Architectural Historian, ICF. Built environment resources lead; technical evaluation for cultural resources. Education: M.A. Public History/Historic Preservation; B.A. History. Years of experience: 20.

***Nicole Hurley* –** Archaeologist, CRGT, Inc. Technical review of cultural resources analysis. Education: B.A. Anthropology. Years of experience: 6.

***Matthew Kitchen* –** Project Director, ECONorthwest. Senior oversight for the transportation analysis. Education: M.P.A. Evans School of Public Policy and Management; B.A. Literature and Anthropology. Years of experience: 18.

***Karryl Krieger* –** Interdisciplinary Fisheries Biologist, U.S. Forest Service, Salmon-Challis National Forest. Project lead. Education: B.S. Fisheries. Years of experience: 27.

***Colleen Lingappaiah*** – Project Manager, ICF. Project coordinator/manager for resource analyses and development of the EIS. Education: B.A. Biology; B.A. German. Years of experience: 24.

***Claire McClory*** – Environmental Compliance Lead, Bonneville Power Administration. Responsible for draft review and editorial assistance in the development of this EIS. Education: B.A. Environmental Science; M.U.E.P Urban and Environmental Planning. Years of experience: 5.

***Ed MacMullan*** – Project Director, ECONorthwest. Senior oversight for socioeconomics and land use and recreation analyses. Education: M.S. Agricultural Economics and International Agricultural Development; B.S. Soil Science. Years of experience: 26.

***Ariana Marquis*** – Editor, ICF. Editorial review of EIS. Education: M.A. Publishing; B.A. English. Years of experience: 5.

***Tim Messick* –** Graphic Designer, ICF. Graphics production. Education: M.A. Biology; B.A. Botany. Years of experience: 33.

***Chris Moelter* –** Senior Manager, ICF. Project coordinator/manager for resource analyses and development of the EIS. Education: B.S. Zoology; M.E.M. Ecotourism. Years of Experience: 14.

***Rick Oestman*** – Aquatic Ecologist, RO Consulting. Technical analyses for groundwater and surface water quality, groundwater and surface water quantity and rights, and fish. Education: M.S. Fisheries; B.S. Fisheries. Years of Experience: 30.

***Corrine Ortega*** – Publications specialist, ICF. Document formatting and publication. Education: A.A. Communications, Photography. Years of experience: 26.

***Jennifer Padilla-Rogers*** – Project coordinator, ICF. Project coordination; technical analysis for public health and safety. Education: B.S. Marine Biology. Years of experience: 7.

***Jenna Peterson*** – Environmental Protection Specialist, Bonneville Power Administration. Project coordinator and EIS reviewer. Education: M.S. Anthropology and Museum Studies; B.A. Anthropology. Years of experience: 13.

***Jennifer Purvine*** – Wildlife Biologist, U.S. Forest Service, Salmon-Challis National Forest. Technical review of wildlife sections. Education: B.S. Wildlife Science. Years of experience: 19.

***Sarah Reich*** – Project Manager/Policy Analyst, ECONorthwest. Lead project manager for socioeconomics, land use and recreation, and transportation analyses. Education: M.A. Urban and Environmental Policy and Planning; Certificate in Water: Systems, Science, and Society; H.B.S. Environmental Economics, Policy, and Management; H.B.S. Geography. Years of experience: 12.

***Mark Reiser*** – Senior Project Manager, McMillen Jacobs Associates. Design/planning project lead. Education. B.S. Civil Engineering Technology. Years of experience: 32.

***Austin Rempel*** – Senior Analyst, ECONorthwest. Technical analysis for socioeconomics; assisted with GIS analysis. Education: B.A. Economics; B.A. Ecology and Evolutionary Biology. Years of experience: 3.

***Anna-Robinson-Mathes*** – Research Technician, ICF. Technical evaluation for cultural resources. Education: B.A. Anthropology. Years of experience: 4.

***Ken Rodgers*** – NEPA Team Leader, U.S. Forest Service, Salmon-Challis National Forest. Review of EIS for compliance with U.S. Forest Service, Salmon-Challis National Forest NEPA requirements. Education: M.S. Watershed Management; B.S. Wildlife Biology. Years of experience: 40.

***Don Rose*** – Supervisory Environmental Protection Specialist, Bonneville Power Administration. Reviewer of the draft EIS. Education: B.S. Forest Management. Years of experience: 33.

***Zeph Schafer*** – Analyst, ECONorthwest. Technical analysis for transportation. Education: B.S. Economics; B.S. History. Years of experience: 2.

***Sacha Selim*** – GIS Analyst, ICF. GIS-related graphics production. Education: B.A. Business Management/Economics; GIS Certificate Program. Years of experience: 9.

***Shane Sparks*** **–** Archaeologist/GIS Analyst, ICF. Technical evaluation for cultural resources. Education: B.A. Religious Historical Studies. Years of experience: 13.

***Jennifer Stock, PLA*** **–** Visual Resource Specialist, ICF. Technical analysis for visual quality. Education: B.A. Landscape Architecture (BLA). Years of experience: 17.

***Daniel L. Stone*** **–** Policy Analyst, Shoshone-Bannock Tribes. Tribal project planning lead. Education: J.D. Indian Natural Resource Law. Years of experience: 9.

***Benjamin Toole*** **–** North Zone Wildlife Biologist, U.S. Forest Service, Salmon-Challis National Forest. Technical review of wildlife sections. Education: M.S. Wildlife, B.S. Wildlife Ecology, B.S. Parks and Recreation Administration. Years of experience: 12.

***Jason Volk*** – Noise Specialist, ICF. Technical analysis for noise. Education: B.S. Mechanical Engineering. Years of experience: 15.

***Dan Warren*** – Science Lead, DJ Warren & Associates, Inc. Hatchery program science; operations lead. Education: M.S. Fisheries; M.B.A. Years of experience: 35.

Chapter 7

# List of Agencies, Organizations, and Persons Contacted

## Federal Agencies

National Marine Fisheries Service

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

U.S. Forest Service, Salmon-Challis National Forest

## Local Governments

Bingham County Board of Commissioners

City of Challis

City of Clayton

City of Stanley

Custer County Board of Commissioners

Lemhi County Board of Commissioners

## Public Officials

Idaho State Representative Dell Raybould
District 34

Idaho State Representative Judy Boyle
District 9

Idaho State Representative Julie VanOrden
District 31

Idaho State Representative Lenore Hardy-Barrett
District 35

Idaho State Representative Neil Anderson
District 31

Idaho State Representative John Stevenson
District 26A

Idaho State Representative Terry Gestrin
District 8

Idaho State Representative Wendy Jaquet
District 25A

Idaho State Senator Jeff Siddoway
District 35

Idaho State Senator Joe Stegner
District 7

Idaho State Senator Michelle Stennett
District 25

Idaho State Senator Mondy Pearce
District 9

Idaho State Senator Steven Blair
District 31

Idaho State Senator Steven Thayn
District 8

## Businesses

Blackbird Mine Site Group

Formation Capital Corporation

Hercla Mining Company

Houghland Farms Inc.

Idaho Consumer Owned Utilities Association

Idaho Power

Mile High Outfitters

Mothers Chukars Cafe

Moon and Associates, Inc.

Moore Smith Buxton & Turcke, Chtd.

Noranda Mining Inc.

Rawhide Outfitters

Salmon River Electric

Thompson Creek Mining Company

## State Agencies

Idaho Association of Counties

Idaho Department of Environmental Quality

Idaho Department of Fish and Game

Idaho Department of Transportation

Idaho Department of Water Resources

Idaho Office of Species Conservation

Idaho Parks and Recreation

Idaho State Historic Preservation Office

Idaho Upper Salmon Basin Watershed

State of Idaho Department of Natural Resources

State of Idaho Department of Parks

State of Idaho Environmental Council

## Tribes or Tribal Groups

Burns Paiute Tribe

Fort McDermitt Paiute and Shoshone Tribes of the Fort McDermitt Indian Reservation

Nez Perce Tribe

Shoshone-Bannock Tribes of the Fort Hall Indian Reservation

Shoshone Paiute Tribes of the Duck Valley Indian Reservation

Upper Snake River Tribes Foundation Inc.

## Interest Groups

Association of Northwest Steelheaders

Clayton Area Historical Association

Idaho Conservation League

Idaho Rivers United

Idaho Salmon and Steelhead Unlimited

Land of Yankee Fork Historical Association

Native Fish Society

Northwest Sportfishing Industry Association

Ramey Subdivision

RedFish BlueFish

Save Our Wild Salmon Coalition

Snake River Salmon Solutions

Trout Unlimited

Western Watersheds Project

## Individuals

Bevan, Carla

Boran, Michael

Broncho, Anna

Buckskin, Preston

Colter, Beth

Cruz, Wayne

Denny, Dexter

Denny, Keanius

Denny, Kyle

Denny, Susan

Eckelsdafer, John

Farmer, Wendy

Fernandez, Chuck

Fernandez, George

Galloway, Evelyn

Garcia, Dan

Graves, Ronald

Hade, David

Leclair, Lonny

Lusher, George

Peterson, Mary Beth

Pruskin, Tammi

Rogers, Kenny

Schoby, Greg

Sillings, Dick

Sillings, Kathy

Stone, Travis

Suzzah, Lori

Thomas, Joi

Wartburton, Dennis

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# Chapter 8
# Glossary

**Acclimation:** The process in which an individual organism adjusts to a gradual change in its environment (such as a change in temperature, humidity, photoperiod, or pH), allowing it to maintain performance across a range of environmental conditions.

**Alevin**: The third stage of the salmonid life cycle, between eyed eggs and fry. Alevins are larval salmonids, typically about one inch long, that have hatched from the egg but have not yet fully absorbed their yolk sac, and generally have not emerged from the spawning gravel (redd). Alevins remain in the redd for approximately one month until their yolk sac is completely digested, and then emerge from the gravel as fry to hunt for food on their own.

**Bar-rack weir:** See *weir*.

**Bridge picket weir**: A type of weir supported and suspended by a bridge that has pickets to form a trap for trapping fish.

**Bridge weir:** A type of weir supported and suspended by a bridge over a stream or river.

**Broodstock:** Adult fish used in the hatchery for breeding.

**Canal gate:** A gate located at the top of a fish ladder that can be used to redirect water from the holding ponds directly into the river to allow maintenance activities to take place.

**Coded-wire tag:** An animal migration tracking device, used specifically for tracking fish migration. It consists of a small piece of magnetized wire injected into the snout or cheek of a fish so that it may be tracked for research or fisheries management.

**Cone screen:** A type of screen used to preclude debris from entering the intake of a water collection system.

**Contributing population:** A population, or "stock," of salmon that contributes a portion, or all, of the genetic material found in a given population. Some populations are based on a native stock, whereas some populations have been modified by the introduction of other native or hatchery stocks.

**Creel survey:** Fisheries management survey method commonly used to interview recreational fisherman to determine the types and number of fish caught and estimate recreational fishing harvest.

**Critical habitat:** Habitat essential to the conservation of an endangered or threatened species listed under the federal Endangered Species Act that has been designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

**Environmental justice populations:** Low-income and minority populations protected under Executive Order 12898 from disproportionate adverse effects of federal projects.

**Escapement:** The proportion of an anadromous fish population that escapes fisheries and broodstock collection and reaches the freshwater spawning grounds.

**Essential fish habitat (EFH):** Defined in the Magnuson-Stevens Act as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The rules promulgated by the National Marine Fisheries Service in 1997 and 2002 further clarify essential fish habitat with the following definitions:

- Waters—aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate.
- Substrate—sediment, hard bottom, structures underlying the waters, and associated biological communities.
- Necessary—the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem.
- Spawning, breeding, feeding, or growth to maturity—stages representing a species' full life cycle.

**Evolutionarily significant unit (ESU):** A Pacific salmon population or group of populations that is substantially reproductively isolated from other salmon populations and that represents an important component of the evolutionary legacy of the species.

**Eyed eggs:** The second stage of the salmonid life cycle, between embryos and alevin. Eyed eggs develop approximately one month after eggs have been fertilized when the embryo inside the egg develops an eye. This stage typically lasts for one month until the eyed eggs hatch and alevin emerge.

**Finger weir:** A short structure that protrudes into a pond or pool that allows fish to enter into the pre-sort area, but prevents them from returning to the ladder.

**Fingerlings:** A young fish that has developed to about the size of a finger.

**Fish ladder:** A structure on or around artificial and natural barriers (such as dams, locks, and waterfalls) to facilitate anadromous fishes' natural migration. Most fish ladders enable fish to pass around the barriers by swimming and leaping up a series of relatively low steps (hence the term ladder) into the waters on the other side. The velocity of water falling over the steps has to be great enough to attract the fish to the ladder, but it cannot be so great that it washes fish back downstream or exhausts them to the point of inability to continue their journey upriver.

**Fish weir:** An obstruction placed wholly or partially across a river to direct the passage of fish. A weir may be used to trap fish, such as salmonids, as they attempt to swim upstream. Alternatively, fish weirs can also be used to channel fish to a particular location.

**Founder effect:** The loss of genetic variation that occurs when a new population is established by a very small number of individuals from a larger population.

**Fry:** The fourth stage of a salmonid life cycle, between alevin and parr. Fry move in schools and actively feed in the river on zooplankton until they grow large enough to eat aquatic insects and other larger food. Some species begin their downstream migration to the ocean as fry, while other species stay in the freshwater for up to three years.

**Geometric mean:** A type of mean or average, which indicates the central tendency or typical value of a set of numbers by using the product of their values, as opposed to the arithmetic mean, which uses their sum.

**Half-Ice Harbor fish ladder**: An adaptation of the design suited for smaller flows, which is half of the full Ice Harbor fish ladder cut along the centerline (see *Ice Harbor fish ladder* below). Although the design optimizes flow stability, the feasible range of operating flow is limited and a relatively constant forebay elevation must be maintained.

**Hatchery–origin returns or hatchery-origin recruits**: Fish incubated and reared in a hatchery and released as juveniles, that return as adults to the river into which they were released.

**Hopper:** A temporary storage bin, filled from the top and emptied from the bottom, often funnel-shaped.

**Ice Harbor fish ladder:** The Ice Harbor ladder configuration was developed specifically for the ladders at Ice Harbor Dam on the Snake River in Washington State. The design was developed in response to the need for a pool and weir type ladder that could operate effectively with a greater slope than is normally feasible. The design is an adaptation of the pool and weir concept, where each weir has two overflow sections located adjacent to the walls and a baffle section in the center that does not overflow. The baffle section is constructed with flow stabilizers that extend in the upstream direction. Submerged orifices are provided directly below the overflow sections of the weir.

**Integrated harvest program:** An integrated hatchery program (see next definition), the purpose of which is to provide harvest. "A fundamental purpose of an integrated hatchery program is to increase abundance [for harvest], while minimizing the genetic divergence of a hatchery broodstock from a naturally spawning population" (HSRG 2009). This is achieved by incorporating natural origin spawners in the hatchery broodstock.

**Integrated hatchery program:** A hatchery program that manages wild and hatchery fish as one gene pool (natural-origin fish are included in the broodstock and hatchery-origin fish are allowed to spawn in the wild). A program is considered an integrated type if the intent is for the natural environment to drive the adaptation and fitness of a composite population of fish that spawn both in a hatchery and in the wild.

**Jib crane:** A type of crane where a horizontal member (jib or boom), supporting a moveable hoist, is fixed to a wall or to a floor-mounted pillar. The jib may swing through an arc, to give additional lateral movement, or be fixed. Similar cranes, often known simply as hoists, were fitted on the top floor of warehouse buildings to enable goods to be lifted to all floors.

**Jurisdictional wetlands and waters:** Wetlands and water bodies that are protected either under the federal Clean Water Act Section 404 or under state or local regulations.

**Natural-origin returns or natural-origin recruits:** Adult fish returns to a river basin that are progeny of fish that spawned in the natural environment.

**Outplant:** The release of fish to aquatic habitats.

**Oxbow lake:** A U-shaped body of water that forms when a wide meander from the main stem of a river is cut off, creating a free-standing body of water. This landform is so named for its distinctive curved shape, resembling the bow pin of an oxbow. The word "oxbow" can also refer to a U-shaped bend in a river or stream, whether or not it is cut off from the main stream.

**Parr:** The fifth stage of the salmonid life cycle, between fry and smolt. Parr have distinct markings (parr marks) to camouflage them from predators as they feed on aquatic insects and other larger prey in a stream environment.

**Picket panel:** A number of pickets (poles) attached together to form a section of a weir.

**PIT tag:** Passive Integrated Transponder (PIT) tags help scientists study the movement of animals. PIT tags are able to track animal movements by acting as a lifetime barcode for an individual animal, analogous to a Social Security number. Provided they can be scanned, they are as reliable as a fingerprint.

**Planting:** Releasing fish raised in a hatchery into another water body for the purposes of supplementing existing populations or creating new ones for fishing or to increase a species population. Same as stocking.

**Redd:** The nest dug in the gravel substrate of streams for egg deposition during spawning by salmonids.

**Recruits:** Fish that have survived long enough to become part of (i.e., recruited into) a population at a defined age (e.g., a natural-origin fish that survives to spawn in the wild is a natural-origin recruit). The number of recruits per spawner is a method of analyzing population productivity.

**Salmonid:** A fish belonging to the family Salmonidae, which includes salmon, trout, and chars. Some species of salmonids are anadromous (e.g., coho salmon, Chinook salmon, steelhead trout), and some species remain in freshwater throughout their life cycle (e.g., rainbow trout, bull trout).

**Smolt:** The sixth stage of the salmonid life cycle, between parr and ocean-stage adult. Smolts undergo physiological and behavioral transformations as they migrate downstream that prepare them for the transition to the saltwater environment.

**Species of Concern:** Species whose conservation status is of concern to the U.S. Fish and Wildlife Service, but for which further information is still needed. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing under the federal Endangered Species Act.

**Stray rates:** The rate at which adult salmonids migrate upstream to non-natal streams (i.e., streams where they were not born).

**Subbasin:** A structural geologic feature where a basin forms within a larger basin.

**Thalweg:** The line of lowest elevation within a valley or watercourse. In hydrological and fluvial landforms, the thalweg is a line drawn to join the lowest points along the entire length of a stream bed or valley in its downward slope, defining its deepest channel. The thalweg, therefore, marks the natural direction (the profile) of a watercourse.

**Threatened species:** Under the federal Endangered Species Act, any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service.

**Top-hinged bridge weir:** A weir structure that is hinged at the top to allow pickets to be rotated up and out of the water.

**Vertical bar gate:** A blocking structure located at the lower end of a fish ladder to prevent migration into the ladder.

**Volitional release:** Refers to the release of juvenile salmonids, allowing them to initiate migration downstream by themselves, without being forced to migrate.

**Weir:** A fence-like device that is installed across a river or stream to capture fish**.**

**Wetlands:** For the purposes of the federal Clean Water Act, wetlands must meet a three-parameter set of criteria that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, and the wetland must be connected to or have a significant nexus with "waters of the U.S." for an area to be designated as a jurisdictional wetland under the Clean Water Act.

**Wing wall:** A smaller wall attached or next to a larger wall or structure. In a bridge, the wing walls are adjacent to the abutments and act as retaining walls. The wing walls are generally constructed of the same material as those of abutments, and can either be attached to the abutment or be independent of it.

**Work window:** The timing when work may take place in the stream or river channel to protect fish. The in-water work window is meant to avoid construction during sensitive periods and the presence of listed fish species in the watercourses, and typically must be approved by the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Idaho Department of Fish and Wildlife.

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# Appendix A
Public Scoping Comments

# Appendix A
## Public Scoping Comments

The Bonneville Power Administration, the Shoshone-Bannock Tribes, and the U.S. Forest Service conducted a series of public meetings to provide project-related information and to solicit public input regarding the issues and alternatives to be addressed in the environmental impact statement prepared for the Crystal Springs Hatchery Program. These meetings were held as follows:

Tuesday, June 10, 2014
Fort Hall, Idaho

Wednesday, June 11, 2014
Salmon, Idaho

Thursday, June 12, 2014
Challis, Idaho

The public comment period to provide scoping comments on the Crystal Springs Hatchery Program ended on July 7, 2014. The comments presented in this appendix were posted via the Bonneville Power Administration's website for the Crystal Springs Hatchery Program. The website and public comments are available at:

https://www.bpa.gov/applications/publiccomments/CommentList.aspx?ID=233

## **CSHP14 0001** *(no comment provided)*

## CSHP14 0002 – Public

> "I do not approve of the crystal springs hatchery. hatcher fish are subject to endless diseases.they are not like wild fish. if you want fish, protect the wild ones and stop killing them off and defiling the environment with energy projects. cheney and bush sure did a number of destruction of the American environment. doe continues in this awful destructive mode. it is useless to grow diseased hatchery fish. you kil lthe birds that come there to catch a few. the whole thing is sickening. and then putting out the diseased fish kills all the wild fish you have left. this is a stupid way to spend American tax dollars."

## CSHP14 0003 – Public2

"I do not support hatchery fish, which are weak and diseased far too often. fat better to protect wild fish instead of destroying them as this dept does.

also stop shooting the seals which need the fish to live

get rid of the commercial fish profiteers from the area - ban them totally from this area. this comment is for the public record."

## CSHP14 0004 – Public3

"It is a wonderful idea to do what we are doing.  His suggestion is to look at a hatchery location in Trail Creek drainage, about 6.5 miles up Panther Creek.  5-7 years ago, the Indian Tribe was considering this as a high priority.  Steelhead are going into Trail Creek and spawning.  For years, the Tribe has put fingerlings in ponds.  He can show us where the fish are going.  He supports a fishery in Panther Creek.  It is long overdue.  He has a summer home on Panther Creek."

## CSHP14 0005 – Baker/Houghland Farms, Inc.

See attached document for comment.

Law Offices of
BAKER & HARRIS

Dwight E. Baker
Jared M. Harris *
Jonathan W. Harris
* Also Admitted in Utah

266 W. BRIDGE STREET
BLACKFOOT, ID 83221
Telephone (208) 785-2310
Facsimile (208) 785-6749
E-Mail — debaker@bakerharrislaw.com
Web — www.bakerharislaw.com

June 3, 2014

***VIA FACSIMILE - (503) 230-4019***

Bonneville Power Administration
Public Affairs - DKC-7
PO Box 14428
Portland, OR 97293-4428

Re: KEC-4 / Crystal Springs Hatchery Program / Comment from Houghland Farms, Inc.

To whom it may concern:

This law firm represents Houghland Farms, Inc., and submits this letter on its behalf. Please consider this as a comment to be considered as a part of the review process for the proposed Crystal Springs Hatchery program.

Houghland Farms, Inc., previously owned the property, and continues to own an easement for an irrigation line, recorded as Instrument No. 376312, records of Bingham County, Idaho, and also is the owner of water right license 35-7142A, the point of diversion of which is on the subject property. Lastly, there is a power line which traverses the west edge of the property, running from the north southerly to the irrigation pump located in the southwest corner of the subject property.

Negotiations are presently underway with interested persons to move the point of diversion of the water right closer to the north edge of the property in close proximity to the artesian spring from which Crystal Springs originates. As a part of that process, it is contemplated that the easement for pump and water line referred to above would be modified, greatly limiting the burden on the remaining Crystal Springs property. Additionally, it is contemplated the power line would be largely removed from the west edge of the property, and the point of diversion for water right 35-7142A would be modified.

It is the purpose of this comment to simply advise the decision makers of the ongoing plans to accomplish these changes as a part of the positive development of the Crystal Springs hatchery.

Very truly yours,

BAKER & HARRIS

Dwight E. Baker

Dwight E. Baker
DEB/bc
cc: Houghland Farms, Inc., c/o John Houghland

## **CSHP14 0006** *(no comment provided)*

## CSHP14 0007 – Kampwerth/U.S. Fish and Wildlife Service

"Appreciate the opportunity to attend the scoping meeting at Fort Hall.

Based on what I understand to be the proposal, the Service offers a preliminary species list for consideration during the planning, EIS development, and consultation process.

Those include Ute's Ladies Tresse, Yellow Billed Cuckoo, Bull Trout, migratory birds, and bald and golden eagles.

Take care,

David Kampwerth, Field Supervisor
Eastern Idaho Field Office

See attached letter"

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Eastern Idaho Field Office
4425 Burley Dr., Suite A
Chubbuck, Idaho 83202
Telephone (208) 237-6975
http://IdahoES.fws.gov


Don Rose, Environmental Coordinator
Bonneville Power Administration-KEC-4
P.O. Box 3621
Portland, Oregon 97208-3621

Subject: Bonneville Power Administration's Proposed Crystal Springs Hatchery Program (#FF01EIFW00-2014-TA-0614) (ER14-0336)

Dear Mr. Rose:

The Fish and Wildlife Service (Service) is writing in regards to Bonneville Power Administration's (BPA) Notice of Intent to prepare an Environmental Impact Statement (EIS) for a proposal to fund the Crystal Springs Hatchery Program on the Fort Hall Reservation.

National Environmental Policy Act (NEPA) regulation 40 CFR § 1503.1(a)(1) states the action agency shall obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. As such, we are responding to your request for concerns and comments for use and consideration in your EIS and to assist BPA in meeting its requirements under NEPA. Comments provided also are in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended.

The Service understands BPA is proposing to fund the construction, operation, and maintenance of the Crystal Springs Hatchery by Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho (Tribes) in Bingham County, Idaho, as well as two fish trapping (weir) facilities on U.S. Forest Service (USFS) lands along the Yankee Fork of the Salmon River and Panther Creek in Custer and Lemhi Counties, Idaho. The Yankee Fork fish trapping facility would include construction of the Yankee Fork weir and associated facilities and relocation of a section of the Yankee Fork Road. The Panther Creek fish trapping facility would be limited to construction of a weir. Operation of the hatchery would include the collection of adult spring/summer Chinook salmon (*Oncorhynchus tshawytscha*) for broodstock from existing hatcheries, incubation and rearing of juvenile Chinook salmon, and release of smolts into the Yankee Fork and Panther Creek. Broodstock would be collected at the Yankee Fork and Panther Creek weirs. The hatchery would also produce Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) for release in an isolated oxbow lake within the Fort Hall Reservation permit fishing area.

On June 10, 2014, the Service attended a meeting hosted by BPA to discuss the Crystal Springs Hatchery Program. At the meeting, a general overview of the project description was provided and discussed. Based on the information provided at the meeting, the Service has a number of concerns we recommend be addressed in the BPA's EIS.

**Proposed Action and Alternatives**

The proposed action and alternatives should be thoroughly described in the EIS. All impacts prior to and throughout construction and operation should be described, as well as the anticipated effects of those impacts. Descriptions of hatchery construction and operation should include hatchery design, water filtration system, and all ancillary facilities; including transportation and electrical infrastructure. The descriptions of fish trapping facilities construction and operation should include the number and design of weirs, the schedule for checking weirs, and protocols for releasing non-target fish.

Each alternative should:

- describe and consider the impacts of increased duration and intensity of light, vibration and noise resulting from construction and operation
- discuss how sensitive fish and wildlife habitats and/or seasons would be avoided or protected
- describe best management practices that would be implemented for the containment and use of chemicals and petroleum-based products, introduction and mitigation of invasive species, and erosion and sediment control.

The project areas should be thoroughly described and include the areas that may be impacted by additional electrical transmission lines, and roads or trails. The EIS should state time frames for completion of each element of the program.

**Ute Ladies'-Tresses** (*Spiranthes diluvialis*)

Ute ladies'-tresses, a species listed as threatened under the ESA, is known to occur along the Snake River on the Fort Hall Reservation. Consequently, the Service has interest in potential effects to Ute ladies'-tresses throughout the construction process, including pre and post construction and recommends incorporation of surveys for Ute ladies'-tresses as part of all alternatives. Detailed inventory and mapping of threatened and endangered plant species in and near construction areas could identify potential problems. Disturbance of Ute ladies'-tresses and adjacent habitats increases fragmentation, inhibits pollination, and potentially removes foraging habitat for pollinators of Ute ladies'-tresses. Each alternative action should describe measures to be taken to avoid Ute ladies'-tresses.

**Bull Trout** (*Salvelinus confluentus*)

Threatened bull trout occur in the Yankee Fork and Panther Creek drainages. The Service has interests regarding potential changes to Yankee Fork and Panther Creek habitats as a result of the proposed action and recommends all impacts to bull trout be considered and addressed accordingly within the EIS, including but not limited to, incidental trapping avoidance of bull trout in weir systems, changes to nutrient levels, changes to sedimentation, changes to flow rates above and below construction sites, competition and predation from introduced species, and short-term and long-term impacts of changes to biomass in the Snake River, Yankee Fork, and Panther Creek drainages.

**Yellow-Billed Cuckoo** *(Coccyzus americanus)*
Yellow-billed cuckoo are currently proposed for listing under the ESA. Yellow-billed cuckoo are dependent on large areas of riparian ecosystems, thus actions occurring in or near riparian areas should consider effects to nesting, brood rearing, and habitat fragmentation which may impact health and vigor of Yellow-billed cuckoo.

**Greater Sage-Grouse**
Proposed actions within sagebrush habitat should be carefully planned to avoid or minimize potential impacts to Greater sage-grouse (*Centrocercus urophasianus*), a candidate species. The Service recommends the *Guidelines to Manage Sage Grouse Populations and their Habitats*, which was written to assist land managers in managing sage grouse habitats and populations (Connelly et al., 2000).

**Water Quality and Quantity**
The EIS should address potential impacts of sediment deposition and erosion in project areas. Changes to water quality and quantity such as turbidity, velocity, nutrient levels, and chemicals have varying effects on habitats and should also be addressed for potential impacts to the Snake River, Yankee Fork, and Panther Creek drainages.

**Migratory Birds**
Potential short-term and long-term impacts to migratory birds and their habitat should be specifically addressed in the EIS. The Service recommends construction be timed to avoid nesting and breeding season for migratory birds to the extent practicable. Projects from early spring through late summer (April-August) would have the highest potential for deleterious effects to migratory birds. During this time, construction could result in the destruction of active nests and young birds which breed in the area. Such destruction may result in unintentional take under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. §703-712). The MBTA prohibits the take of migratory birds, their parts, nests, eggs, and nestlings. Executive Order 13186, issued on January 11, 2001, affirmed the responsibilities of Federal agencies to comply with the MBTA. The MBTA also requires the development of a strategy for the Service to work with Federal agencies to conserve priority species by avoiding and minimizing unintentional take and taking actions to benefit these same species to the extent practicable.

**Bald and Golden Eagles**
The Service recommends use of the *National Bald Eagle Management Guidelines* (USFWS, 2007) and the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* (USFWS, 2002), which were developed in part to provide consistent application of raptor protection measures and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Guidelines as recommendations to ensure proposed projects will avoid adverse impacts to raptors. Locations of existing raptor nests should be identified prior to initiation of construction. Direct loss of nesting sites or territories should be avoided. Appropriate spatial buffer zones of inactivity should be established during crucial breeding and nesting periods relative to raptor nest sites or territories.

**Invasive Species**
The Service recommends an inventory of invasive species become part of all action alternatives. Detailed inventory and mapping of invasive species in and near any construction areas could identify potential problems. Each alternative should be evaluated with regard to the potential for new vectors and increased spread of invasive species. Alternatives should describe measures which would be taken to avoid and/or control invasive species. Size and timing of vegetation treatments influence the impacts of these projects on wildlife and their habitats. The EIS should discuss impacts from the introduction of invasive species, accounting for insects, terrestrial and aquatic wildlife, parasite and disease transference, and sensitive wildlife areas with consideration taken for the size and timing of the project. The Service recommends the EIS discuss anticipated vegetative communities in affected areas and the impacts resulting from changes in the extent, distribution, and composition to native vegetative communities.

**Wetlands/riparian Areas**
Wetland and riparian areas are sensitive habitats which are relatively scarce and highly valuable to many species of insects, amphibians, reptiles, fish, birds and mammals. Impacts to these areas should be avoided to the greatest extent possible. Protocols should be developed to monitor changes to ambient decibel levels, vibrations, air quality, water quality, water flow, sedimentation, water temperature, nutrient levels, contaminants in water and air, erosion, and hydrology. Monitoring should be conducted to determine the degree of impact during construction and operation, as well as for any unforeseen impacts.

We greatly appreciate the opportunity to provide comments. If you need further assistance, please contact Evan Ohr (Evan_Ohr@fws.gov) of this office at (208) 237-6975 ext.115.

Sincerely,

David Kampwerth
Field Supervisor

cc: Treichel, OEPC
Nash, BCPA (ERT)

## Literature Cited

Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to Manage Sage Grouse Populations and their Habitats. Wildlife Society Bulletin, 28:967-985.

U.S. Fish and Wildlife Service (USFWS). 2002. Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances. U.S. Fish and Wildlife Service, Utah Fish and Wildlife Office, Salt Lake City, Utah

U.S. Fish and Wildlife Service (USFWS). 2007. National Bald Eagle Management Guidelines, United States Fish and Wildlife Service, Washington D.C.

## CSHP14 0008 – Blair/Idaho State Senator

See attached document for comment.

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

# CRYSTAL SPRINGS HATCHERY PROGRAM

*"I'd like to tell you..."*

Please have your studies look at:

I need more information about:

I have these other comments:

Please forge ahead. Bingham County looks forward to development of this hatchery.

Name/Address: X

You ma

Please mention "*Crystal Springs Hatchery Program*" in your correspondence.

The comment period ends **July 7, 2014.**

## CSHP14 0009 – Carter

See attached document for comment.

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

# CRYSTAL SPRINGS HATCHERY PROGRAM

*"I'd like to tell you..."*

Please have your studies look at:

The impact on water table

I need more information about:

How many CFS will be required
when both Crystal Springs & Legacy Spring Hatchery's
Are in full Production?

I have these other comments:

There are many wells in the area for both
domestic use and Irrigation, that Are 30' or less
My Concern is that with that much water being
pumped out of the aquafier, it may Impact local
wells.

Name/Address:

Yo

Please mention "Crystal Springs Hatchery Program" in your correspondence.

The comment period ends **July 7, 2014.**

## CSHP14 0010 – Comments received at public meetings

Attached: Collective comments received from public meetings.

Crystal Springs Hatchery Program EIS
Public Scoping Meeting Comments
Fort Hall, Idaho
June 10, 2014

1) Has the contamination and chemical been removed from the Yankee Fork?
2) Salmon Fishing has been very important to my family. My father used to fish here and in the ocean, I would fish where he showed me.
3) Once a few fish come back then leave them alone so they can reproduce. Don't take them all to the hatchery.
4) This project is important to our family (Gibson District of Fort Hall). We would like to see this project funded and go forward.
   - Enhance the river system (ecosystem)
   - Economic benefits – Direct: jobs Indirect: supporting services and industries for all communities affected by the project
   - Brings families together through fishing
   - Promotes a healthy lifestyle
   - Brings new traditions for some families and keeps existing traditions intact for other families
   - Fishing in these watersheds is an annual family tradition
   - Allows tribal members and non-tribal members to meeting and interact to develop healthy relationships
   - Young people will see this and be able to carry this project on and possibly add to it
   - Healthy activities like this are good for our youth.
   - My husband taught my son to fish and now my son runs the fisheries program
5) Hope to see more Salmon
6) Will the fish be wild?
7) Yellow billed Cuckoo
8) Yellowstone cutthroat Trout in bottom is ambitious
9) What kind of field studies?
10) Natural or hatchery fish?
11) Taxes on hatchery site?
12) Water rights on property ~ 21.6 cfs
13) Cost? Will it raise electric rates?
14) Will this be a job creator?
15) Funds for personnel to operate hatchery & satellite facilities
16) What is the survival rate expected to be?
17) Are hatchery and natural fish nutritionally equivalent?
18) Project lifespan?
19) Current or future mining above weirs? How will this affect program
20) Studies on effects of mining impacts on fish
21) What are the obstacles to program?
22) What can citizens do to help process?
23) Seismic activity in area?
24) How is the water quality at the hatchery site? Water temp x2
25) How will global climate change affect fish/hatchery
26) Make sure fish are available equally.
27) Fish coming upriver; they can sense or smell if water is bad. They won't go up Panther Creek if there are still chemicals (copper, etc.) in the water. They will smell it at the mouth of the creek at Salmon River.

28) Lots of fish in Yankee Fork and Panther Creek historically. You could walk on them.
29) Big fish used to come upriver in August/September. 50” fish.
30) Fish taste better if you catch them downriver. They are worn out by the time they arrive at Fort Hall area.
31) What is the cost difference between temporary weirs and permanent weirs?
32) Will it be completely a Tribal operation (collection, eggs, rearing, release)?
33) What does No Action mean?
34) How much does it cost to build hatchery?
35) Where does money come from?
36) Am I paying for it?
37) Will it raise my rates?
38) I hope you address my comments, other agencies don’t do so well.
39) What field studies will be done?
40) Will the Tribes conduct the studies or will they be outsourced?
41) The fish that the Tribes will be harvesting will be hatchery fish, correct?
42) Who owns hatchery site land?
43) Will taxes be paid?
44) Will there be work for Tribal members?
45) What is the survival rate? 0.3%?
46) What is life cycle?
47) How long will the project last? (duration)

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Crystal Springs Hatchery Program EIS
Public Scoping Meeting Comments
Salmon, Idaho
June 11, 2014

1) Cobalt – danger of fire in this area.
2) Different level of maintenance on temporary vs permanent weir.
3) 25 year life span on weir. Should weir become non-functional it would be taken out?
4) Will hatchery fish be adipose fin-clipped?
5) Wild and scenic boundary in Panther Creek?

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Crystal Springs Hatchery Program EIS
Public Scoping Meeting Comments
Challis, Idaho
June 12, 2014

1) What is max production of Crystal Springs?
2) Met w/commissioners about reroute of road through Yankee Fork.
3) Custer County is an important contact.
4) IDFG biologist at Sawtooth Hatchery did not hear about meeting.
5) Katie Wood did not hear about meeting until 2 weeks ago.
6) Does steelhead play any role in this proposal? Permanent weir would allow collection of steelhead for IDFG.
7) Would electricity be provided at Yankee Fork? If so, would it be quieter than current generator?

8) What size of bull trout are out there? They have had 29" bull trout at Yankee Fork. Predominantly bull trout. Panther Creek has a lot of brook trout.

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Crystal Springs Hatchery Program EIS
Additional Public Scoping Meeting Comments

1) The hatchery should be managed for more than just a larger salmon harvest; it should also be managed for salmon conservation.
2) How many fish will be raised in the hatchery?
3) Who will pay for the hatchery project?
4) How will the hatchery fish get from the hatchery to the streams in the north?
5) Who will haul the fish from the hatchery to the streams in the north?
6) What is the source of water for the hatchery?
7) Who holds the water rights for the hatchery water source?
8) How many staff will be employed for the hatchery and the in-stream facilities?
9) Will the staff positions be year-round?
10) Does the project cost include salaries for employees?
11) What is the expected survival rate of hatchery fish released to Panther Creek and the Yankee Fork?
12) What is the nutritional content of hatchery-raised fish?
13) What is the life cycle for the new hatchery facility? How long will it be in use?
14) How long will it be before the hatchery is operational?
15) What could potentially delay the construction and operation of the hatchery?
16) Would the fish collection facilities be operational 24 hours a day?
17) What time of year would the fish be collected from the streams?
18) Who would remove the stream-related facilities at the end of the program?
19) What would the water source be for acclimation facilities at Panther Creek?
20) Will all released fish be fin-clipped?
21) Will any water losses related to stream diversions be counted against USFS' water allotments?
22) Will water taken from Panther Creek go under the road?
23) How close will the new facilities at Panther Creek be to the existing barn?
24) What is the timing of placing fish in the holding ponds at Panther Creek?
25) Are the pit tag array and screw trap proposals near Clear Creek separate from the Panther Creek part of the Crystal Springs Hatchery Project?
26) Will harvested fish be placed back in the stream for a nutrient source? The USFS would like 1,000 carcasses returned to Panther Creek.
27) Will live escapes be allowed upstream of the fish weir in Panther Creek?
28) Would all of the Dummy Creek flows be needed to support the Panther Creek fish facilities?
29) Would the project construction activities at Panther Creek modify the fences that currently exist around the pasture area at that location?
30) What are the goals for release of juveniles to Panther Creek and the Yankee Fork?
31) What is the hatchery capacity for smolts?
32) Is there a steelhead element to this program?
33) Will the Pole Flat Campground be modified by the facilities at the Yankee Fork?
34) Does the project include trapping of bull trout?

35) The hatchery should be constructed to allow for raising of 10,000 Yellowstone cutthroat trout rather than just 5,000 trout.
36) Is there a preferred alternative?
37) Does the temporary in-stream facility alternative include temporary out-of-stream holding facilities?
38) What would require more maintenance, temporary or permanent in-stream and out-of-stream facilities at Panther Creek and the Yankee Fork?
39) Hatchery fish released to Panther Creek may not return due to the contamination from the Blackbird Mine.
40) The environmental evaluation should address other species, including yellow-billed cuckoo, bull trout, Ute's ladies tresses, migratory birds, bald eagle and golden eagle.
41) What is the time frame for movement of salmon from the hatchery to the streams, out to the ocean and return to the streams?
42) Has mining occurred along Panther Creek and the Yankee Fork in the past? Is it still occurring?
43) BPA should look in the USFS forest management plans for visual resource management requirements.
44) Is Panther Creek eligible for wild and scenic status?
45) There is a concern for cultural resource damage associated with construction at the Yankee Fork.
46) What can citizens do to support the program?
47) There are two separate forest management plans for the Salmon-Challis National Forest; one for the Salmon and one for the Challis.
48) Are other hatcheries proposed in the area, or proposed as part of the same program?
49) Will non-tribal anglers be allowed to harvest salmon in Panther Creek?
50) The cutthroat trout portion of the project would not be part of the NEPA decision for the USFS.
51) The name of the project does not make it clear that there are Panther Creek and Yankee Fork elements of the overall project.
52) Idaho Department of Fish and Game may have redd surveys of Panther Creek.
53) USFS would like the list of all persons/organizations that received the scoping announcement.
54) From the USFS perspective, scoping for NEPA does not end at a specified time; it continues throughout the process.
55) USFS staff receive copper monitoring information for Panther Creek.
56) USFS would like to know what issues are being raised by the public.
57) Have the County Commissioners been asked to be a coordinating agency?

## CSHP14 0011 – Ecklesdafer

See attached document for comment.

RECEIVED

JUN 2 3 2014

ENVIRONMENT
FISH & WILDLIFE

CRYSTAL SPRINGS HATCHERY PROGRAM

1. I would like you to look at the possibility of locating a hatchery site on the Trail Creek drainage that flows into Panther Creek approximately 7 miles upstream from the Salmon River. This area was considered as a good location for a hatchery by the Indian tribes 10 or so years ago. I have seen Steelhead spawning in the Trail Creek drainage ponds within the past 5 years. The road parallels the creek so that it is just a short walking distance to the area and I would be glad to guide you there. Please call to arrange when we will be available at our place on Panther Creek.

2. Restoring the fishing streams is of great importance to the ecology as well as the economy, especially for Idaho! We have a home located on Panther Creek and would love to see an increase in the fish diversity and population as it must have been many years ago.

## CSHP14 0012 – Joyner/U.S. Army Corps of Engineers

See attached document for comment.

DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS
IDAHO FALLS REGULATORY OFFICE
900 NORTH SKYLINE DRIVE, SUITE A
IDAHO FALLS, IDAHO 83402-1700

REPLY TO
ATTENTION OF

3 July 2014

Regulatory Division

SUBJECT: NWW-2014-280, Crystal Springs Hatchery Program

Bonneville Power Administration
Public Affairs – DKC-7
PO Box 14428
Portland, Oregon 97293-4428

To whom it may concern:

This is in response to your 23 May 2014 letter requesting scoping comments on your proposed Crystal Springs Hatchery Program. Thank you for providing the Corps of Engineers (Corps) the opportunity to provide comment. According to information provided, the proposed project would involve the construction of two (2) fish trapping weirs, with one on the Yankee Fork in Custer County, Idaho and one on Panther Creek in Lemhi County, Idaho. The project would also involve development/redevelopment of a fish hatchery at Crystal Springs in Bingham County, Idaho.

The fish hatchery would be located, within Section 25 of Township 4 South, Range 32 East and Section 30, Township 4 South, Range 33 East, near latitude 43.04516º N and longitude -112.65127º W, in Bingham County, Idaho. The Yankee Fork trapping weir would be located, within Section 8 of Township 1 North, Range 15 East, near latitude 44.30204°N and longitude –114.72121°W, in Custer County, Idaho. The Panther Creek trapping weir would be located in Section 18 of Township 20 North, Range 19 East, near latitude 45.06645°N and longitude -114.27145°W, in Lemhi County, Idaho. Your project has been assigned Department of Army (DA) File # NWW-2014-280, which should be referred to in all future correspondence.

AUTHORITY

The DA exerts regulatory jurisdiction over waters of the United States (U.S.), including wetlands, pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344). Section 404 of the Clean Water Act requires a DA permit be obtained prior to discharging dredged or fill material into Waters of the U.S., which includes most perennial and intermittent rivers and streams, natural and man-made lakes and ponds, irrigation and drainage canals and ditches that are tributaries to other waters, and wetlands.

Based on our review of the information you furnished and available to our office, we have preliminarily determined that as currently proposed your project may involve work requiring DA authorization. The project area may impact the Yankee Fork, Panther Creek, and unnamed tributary (Crystal Springs) to the Snake River and adjacent wetlands. Therefore, a DA permit may be required for the discharge of dredged and/or fill material in these waters and wetlands.

We realize that a project at the scoping level is less detailed than a project that is being reviewed for a DA permit. Our scoping comments at this time are limited. As project details are developed and the level of impact to aquatic resources become clearer we may wish to be a cooperator in development of the EIS.

Additionally as part of any DA permit application and review process we would need a wetland delineation of the project area, particularly for the fish hatchery project area. Prior to permitting, the results of the delineation would need to be reviewed and approved by this office.

All Clean Water Act DA authorizations are required to be in accordance with the Environmental Protection Agency's 404 (b)(l) Guidelines. Under the Guidelines, the applicant must show that all appropriate and practicable steps to minimize potential impacts of the discharge on the aquatic ecosystem have been considered, and that the current proposal represents the least environmentally damaging practicable alternative. The applicant must summarize the steps that they have taken to avoid, minimize and/or mitigate the unavoidable impacts of their proposed project. The burden of proof to demonstrate compliance with the Guidelines rests with the applicant. We encourage you to engage with this office well in advance to understand how avoidance, minimization and mitigation sequencing can be incorporated into your proposed project.

At this time, there is not enough information to address the 404(b)(1) guidelines for this particular project. In accordance with Regulatory Guidance Letter (RGL) 92-3, the level of documentation and the detail of analysis required should reflect the significance and complexity of the proposed discharge activity. This will include analysis of secondary and cumulative effects to the aquatic environment from the proposed action. Secondary effects “are caused by the [proposed] action and are later in time or farther removed in distance, but are still reasonably foreseeable” (40 CFR Part 1508 Sec. 8). Cumulative effects are those that result “from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR Part 1508, Sec. 7).

Please contact me by telephone at (208) 522-1676, by mail at the address in the letterhead, or via email at james.m.joyner@usace.army.mil if you have any questions or need additional information.

Sincerely,

James M. Joyner

James M. Joyner
Sr. Project Manager, Regulatory Division

## CSHP14 0013 – Somers/U.S. Environmental Protection Agency

See attached document for comment.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

OFFICE OF
ECOSYSTEMS, TRIBAL AND
PUBLIC AFFAIRS

July 7, 2014

Mr. Joe DeHerrera, Project Manager
Bonneville Power Administration
Public Affairs Office -- DKE-7
P.O. Box 14428
Portland, Oregon 97292-4428

Re: Crystal Springs Hatchery Program – Notice of Intent to prepare an Environmental Impact Statement and notice of floodplain and wetlands assessment EPA Region 10 Project Number 14-0025-BPA

Dear Mr. DeHerrera:

The U.S. Environmental Protection Agency has reviewed the Crystal Springs Hatchery Program Federal Register Notice of Intent to prepare an Environmental Impact Statement and notice of floodplain and wetlands assessment. We are submitting scoping comments in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. We appreciate this opportunity to engage in the proposed project.

The Crystal Springs Hatchery Program was recommended to BPA by the Northwest Power and Conservation Council Fish and Wildlife Program. Pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980, the purpose is to support efforts to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the Federal Columbia River Power System in the mainstem Columbia River and its tributaries. BPA's EIS will analyze the potential effects of funding the Shoshone-Bannock Tribes of the Fort Hall Reservation of Idaho proposal to construct and operate a hatchery for spring/summer Chinook salmon in the Salmon River subbasin and Yellowstone cutthroat trout in the Upper Snake River subbasin on Fort Hall Reservation.

The proposed project would involve construction of a hatchery, two fish trapping facilities (weirs), and relocation of a section of Yankee Fork Road and RV pads. The hatchery would be located on Crystal Springs in Bingham County, Idaho; the weirs would be located on U.S. Forest Service land in the Yankee Fork of the Salmon River at the Pole Flat Campground in Custer County, and at Panther Creek in Lemhi County, Idaho. A USFS Special Use Permit would be required to construct and operate the weirs and associated facilities. The EIS will also include a floodplain and wetlands assessment as required by the Department of Energy, geared to avoid or minimize potential harm to any affected floodplains and wetlands.

We support BPA efforts to mitigate impacts to fish and wildlife affected by the Columbia River system dams. The NOI states that proposed project operations would include collection of adult spring/summer Chinook for broodstock from the Sawtooth and Pahsimeroi hatcheries located in Custer and Lemhi Counties, Idaho. When possible, we are in favor of using wild fish native to the target watersheds to establish hatchery broodstock. However, we understand (J. DeHerrara, phone conversation) that wild fish are extirpated from Panther Creek, and that Yankee Fork has been supplemented in the past few years and, therefore, no wild run exists there. The NEPA document should address this issue in relation to each of the focus areas and information needs listed below. To inform decision making regarding the proposed Crystal Springs Hatchery Program, we recommend that BPA provide the following information in the EIS:

- A brief summary of the historical salmonid populations, impacts, current conditions, and recovery plans.
- The basis for the recommendation that this proposed hatchery program is needed for the mitigation and recovery of the target salmon stocks and how it would relate to efforts being taken to mitigate and recover Snake River spring/summer chinook through habitat restoration, harvest limitations, and hydroelectric power operations.
- A clear statement of goals and objectives for the proposed project, including but not limited to program designation as conservation or harvest, and whether hatchery operations are intended to be temporary or permanent.
- The co-managers objectives and how they relate to the overall strategy to promote viable salmonid populations (VSPs).
- Discussion of the linkage between Clean Water Act and Endangered Species Act to support self-sustaining wild populations of Salmon River spring/summer Chinook and Upper Snake River Yellowstone cutthroat trout.
- An explanation of how the proposed project would support the recovery of ESA-listed fish and fish species at risk/in decline -- both those targeted for artificial population enhancement (spring/summer Chinook, Yellowstone cutthroat trout) and non-target species that may be affected by the proposed action (such as, bull trout).
- A discussion of effects from hatcheries, including genetic (diversity, domestication, inbreeding depression), ecological (predation, competition, disease), and facility (water quality, fish passage, intake screening).
- Discussion of how hatchery reforms, per the principles, standards and recommendations of the Hatchery Scientific Review Group (HSRG), are integrated into the proposed project, including but not necessarily limited to: hatchery-related fish passage barriers, hatchery intakes, broodstock management, water quality, and watershed-specific plans to implement hatchery reform.
- Criteria that would be used to evaluate the effectiveness of the proposed hatchery program.
- A description of the hatchery management and monitoring program.

Detailed comments pertaining and in addition to those offered above are enclosed for your use in preparing the EIS. If you need more information or would like to discuss these comments, please feel free to contact me at (206) 553-2966 or via electronic mail at somers.elaine@epa.gov. Thank you for the opportunity to participate in the scoping phase of this project.

Sincerely,

Elaine L. Somers
Environmental Review and Sediment Management Unit

Enclosure

## U.S. Environmental Protection Agency Detailed Scoping Comments for the Crystal Springs Hatchery Program

**Purpose and Need**
The NEPA document should include a clear and concise statement of the underlying purpose and need for the proposed project, consistent with NEPA implementing regulations at 40 CFR 1502.13. The purpose and need should reflect not only BPA's purpose but also the broader public interest and need. A concise statement is important to set up the analysis of alternatives, which could range from too tightly focused to too broad, depending on how the statement is written.

**Artificial Production**
Hatcheries can be a useful part of a comprehensive, integrated approach to restoring sustainable runs of salmonids, but should not be the only solution to restoring salmonid populations. Artificial production should be conducted in a scientifically sound manner and considered in the context of the entire watershed. We acknowledge the unique role hatcheries play in mitigating harvest of diminishing wild populations. However, hatcheries should be operated in a manner that recognizes that they exist within an ecosystem and with a goal to promote healthy habitat that supports wild salmon productivity. Hatchery operations should be coordinated with watershed, subbasin, basin and regional scale efforts to improve habitat characteristics and natural production where possible. Naturally selected populations should provide the model for artificially reared populations. Artificial production should strive to minimize adverse effects on biological diversity and to the extent possible, help reverse declines in biological diversity. Artificial production should include an adaptive management design that evaluates the benefits and adverse effects throughout the ecosystem and over the entire life of the species being propagated.

At present, hatcheries serve an important role in meeting commercial, tribal and public harvest obligations. The goal of hatcheries should be to assist recovery and provide opportunities for naturally spawning populations, not to maximize catch in the near term. While production for harvest is a legitimate hatchery objective, adverse impacts on natural populations associated with harvest management of artificially produced populations should be minimized. The NEPA document should explain how this would be accomplished.

The NEPA document should be clear on whether the artificial production program is intended for augmentation, mitigation, restoration, preservation, or research purposes. Periodic reviews of the program and its purpose should be performed to ensure that the program's purpose is being met and a determination made about whether the program should continue. Preferably, hatchery production should be temporary to recover wild stocks, a strategy that has the additional advantage of promoting habitat and water quality that wild salmon require to successfully reproduce. We realize that the extent and nature of habitat loss may often render permanent hatcheries necessary to mitigate or replace lost wild production but where this may be the case, clear justification should be provided.

Hatchery production has potentially negative impacts, such as, confounding wild stock production through mixed stock harvests (overharvesting smaller wild stocks while targeting harvest on larger hatchery stocks) and other potential genetic and biologic complications such as reduction of brood stock biodiversity or hatchery fish outcompeting wild fish for rearing or food. The challenge of hatchery production is to avoid compromising the goals of self-sustaining production and genetically (or locally) adapted populations, both of which may potentially be negated by the confounding factors. We recommend that the NEPA document discuss the duration of the hatchery program and include the adaptive management plan for changing circumstances in fish production, the need to promote wild stocks, and how the effects of climate change would be factored into the proposed program.

**Water Resources**
The NEPA document should indicate whether water bodies listed on the Clean Water Act Section 303(d) list of impaired water bodies occur in the project area and, if so, list the parameters of concern and any applicable TMDLs. Disclose which water bodies may be affected by the project, the nature of the potential impacts and the specific pollutants likely to affect those waters. In particular, the NEPA document should discuss how the proposed Crystal Springs Hatchery Program would be designed, built, and operated to comply with its NPDES permit wasteload allocations for total phosphorous and suspended sediment. Where affected water bodies are not 303(d) listed, the NEPA analysis should demonstrate that the proposed program would comply with anti-degradation provisions of the Clean Water Act.

Source waters. Watersheds affected by proposed projects may also function as public drinking water supplies and/or their source areas. Source water is water from streams, rivers, lakes, springs or aquifers used as a supply of drinking water. Source water areas are delineated and mapped by the state for each federally regulated public water system. The 1996 amendments to the Safe Drinking Water Act require federal agencies to protect sources of drinking water for communities. The NEPA document should identify:

- Source water protection areas within the project area;
- Activities that could potentially affect source water areas;
- Potential contaminants that may result from the proposed project; and
- Measures that would be taken to protect the source water protection areas.

**Cumulative and Indirect Effects**
Impacts from hatcheries may have cumulative effects on affected ecosystems. The NEPA document must assess impacts over the entire area of impact and consider the effects of other past, present and future projects in the area together with the proposed action, including those by entities other than BPA. EPA has issued guidance on how we are to provide comments on the assessment of cumulative effects, *Consideration of Cumulative Impacts in EPA Review of NEPA Documents,* which can be found on EPA's Office of Federal Activities home page at: http://www.epa.gov/compliance/resources/nepa.html.

The cumulative effects analysis should:

- Identify resources that would be cumulatively affected;
- Determine the appropriate geographic (within natural ecological boundaries) area and the time period over which the effects have occurred and would occur;
- Examine all past, present, and reasonably foreseeable future actions that have affected, are affecting, or would affect resources of concern;
- Describe a benchmark or baseline;
- Include scientifically defensible threshold levels.

**Climate Change**
Effects of climate change may include changes in hydrology, sea level, weather patterns, precipitation, and chemical reaction rates, among others. Cumulative effects analysis in the NEPA document should include changes to resources that can reasonably be anticipated due to climate change that may have bearing on aspects of the project (e.g., changes in hydrology that may increase sediment). The NEPA analysis should consider how fishery resources affected by climate change could potentially influence the proposed program.

**Monitoring**
Monitoring should evaluate the effectiveness of individual hatchery programs in meeting their intended purpose (augmentation, mitigation, restoration, preservation, or research) as well as the overall program in maximizing natural spawning populations throughout the region. The NEPA document should identify clear monitoring goals and objectives, such as:

- Questions to be answered;
- Parameters to be monitored;
- Where and when monitoring would take place;
- Who would be responsible;
- Information that would be evaluated and reported;
- Actions (contingencies, adaptive management, corrections to future actions) that would be taken based on the monitoring information;
- How the public could obtain information on mitigation effectiveness and monitoring results.

**Consultation with Native American Tribes**
The Notice of Intent states that the Crystal Springs Hatchery Program is a Shoshone-Bannock Tribes proposal. Nevertheless, the NEPA document should explain how the proposed project could affect historical or traditional cultural places and treaty rights. Identify historic resources and how treaty rights and privileges are appropriately addressed. The proposed program would affect the Tribes' fishing rights, therefore the NEPA process should be conducted in consultation with all affected tribal governments, consistent with Executive Order 13175, *Consultation and Coordination with Indian Tribal Governments.* EO 13175 states that the U.S. government will continue "to work with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights." Documentation of these consultations should be included in the NEPA document. Consistent with the July 28, 1999 memorandum from the Council on Environmental Quality to Heads of Federal Agencies, we urge BPA to consider inviting affected Tribal governments to participate in the NEPA process as cooperating agencies. This would establish a means to address intergovernmental issues throughout the NEPA process.

## CSHP14 0014 – Colter

See attached document for comment.

Date 6/30/14

BPA Public Affairs DKE7

P.O. Box 14428

Portland, OR 97293-4428

Dear Mr. Rose,

I would like to make some comments on the Crystal Springs Hatchery Program

I attended the Public scoping meeting June 10, 2014 at the Shoshone Bannock Hotel and Event Center at Fort Hall.

I believe that the Shoshone Bannock Tribal Fisheries Department did an excellent job at looking at all the aspects of the environmental studies for this project. Dan Stone's presentation was very clear as to the goals and objectives of this "save the fish for the future generations" project.

My husband and I took our children fishing and enjoyed the wilderness 2 to 3 times a month during the summers when our children were growing up. We participated in Salmon fishing on the Salmon River from Decker Flats to the Yankee Fork. We fished for trout and many other species in many areas of Idaho.

This project could save the fish for future generations of all peoples.

Thank You

Ms. Belma Colter

Ms. Belma Colter

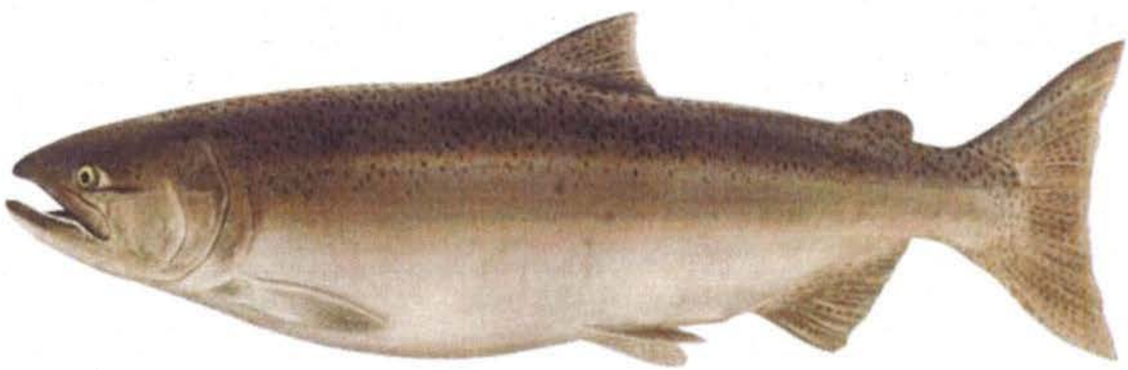
# Appendix B

Shoshone-Bannock Tribes

Tribal Resource Management Plan

# TRIBAL RESOURCE MANAGEMENT PLAN

## For Shoshone-Bannock Tribes' Snake River Spring/Summer Chinook Salmon Fisheries within the Salmon River Sub-Basin



**Prepared for:**

**National Marines Fisheries Service-National Oceanic and Atmospheric Administration**
**Pacific Northwest Region**
**Portland, Oregon**

**December 28, 2010**

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Tribal Resource Management Plan for the Shoshone-Bannock Tribes Snake River Spring/Summer Chinook Salmon Fisheries within the Salmon River Sub-Basin

Responsible Management Agency


| | |
|---|---|
| Agency: | Shoshone-Bannock Tribes |
| Name of Primary Contact: | Lytle Denny, Anadromous Fish Biologist |
| Address: | P.O. Box 306, Bldg. 95, 3rd & B Street |
| City, State, Zip Code: | Fort Hall, Idaho, 83203 |
| Telephone Number: | 208/239-4560 or 208/239-4551 |
| Fax Number: | 208/478-3986 |
| Email Address: | ldenny@shoshonebannocktribes.com |


Date Completed
First draft submitted January 11, 2006
Second draft submitted April 17, 2007
Third draft submitted December 5, 2008
Final copy submitted December 28, 2010

# EXECUTIVE SUMMARY

The Shoshone-Bannock Tribes (Tribes) exercise their right to hunt for Snake River spring/summer Chinook salmon (*Oncorhynchus tshawytscha*) under inherent rights and the Fort Bridger Treaty of July 3, 1868 (15 Stat 673). Section 4(d) Rule (50 CFR 223) allows a tribal government to submit a Tribal Resource Management Plan (TRMP) with the intent of exempting the tribes' harvest of protected species from the Endangered Species Act (ESA). The purpose and scope of this TRMP is to provide the Tribes an exemption under the ESA to harvest listed Chinook salmon in the Salmon River sub-basin, while the species is listed as threatened.

Populations of Chinook salmon decreased substantially coincident with the construction of hydroelectric dams on the lower Snake and Columbia rivers (Raymond 1988; Williams 1989). Water diversions, mining, logging, livestock grazing, agriculture, municipalities, sedimentation, and commercial fisheries all played a significant role in further reducing anadromous fish populations to the point where Chinook salmon were listed under the ESA as threatened on April 22, 1992 (57 FR 14653).

Prior to 1992, the Tribes implemented Chinook salmon fisheries throughout the Salmon River, but in 1992 the dynamics of these fisheries were drastically altered. Tribal Chinook salmon fishing up until 1976 was governed by the Fort Hall Business Council (FHBC), Tribal fisherman harvested only what was necessary for sustenance. In 1975, the FHBC acting as the Fish and Game Commission (Commission) adopted the 1975 Tribal Game Code, as amended (Shoshone-Bannock Tribes 1975). The 1975 Game Code, as amended contained the Chinook salmon fishing regulations and guidelines up until 1992. The annual harvest guidelines change on a yearly basis and are dependent upon escapement forecasts. Since the ESA protections were established, the Tribes were left to adapt their fishing practices to hatchery influenced areas, which resulted in a diminishment of fishing practices in traditional fishing areas.

The TRMP was developed to manage Tribal Chinook salmon harvest in the Salmon River on natural and hatchery-origin Snake River spring/summer Chinook salmon. The Tribes utilized the ICTRT (2007) population designations with some minor modifications to develop fishery management areas (FMA) for twenty-two populations. The Tribes developed three abundance-based sliding-scale harvest management frameworks, forecast methodology, protocol for developing annual harvest guidelines, and a detailed monitoring and evaluation plan.

There are three stocks of Snake River spring/summer Chinook salmon in the Salmon River, known as major population groups (MPG) (Waples 1995); South Fork, Middle Fork, and Upper Salmon River. The South Fork Salmon River includes the mainstem South Fork, Secesh River, East Fork South Fork Salmon River, and the Little Salmon River. The Middle Fork Salmon River includes Big Creek, Bear Valley Creek, Middle Fork Upper Main, Chamberlain Creek, Camas Creek, Loon Creek, Marsh Creek, Middle Fork Lower

Main, and Sulphur Creek. Finally, the Upper Salmon River includes Lemhi River, Salmon River Lower Main, Pahsimeroi River, East Fork Salmon River, Salmon River Upper Main, Panther Creek, Valley Creek, Yankee Fork Salmon River, and North Fork Salmon River.

The Tribes will harvest Chinook salmon in accordance with three proposed abundance-based sliding-scale harvest management frameworks for natural-origin populations, supplemented natural-origin populations, and hatchery mitigation stocks. The harvest framework for natural and supplemented populations incorporate the viable population thresholds (VPT) defined by the ICTRT (2007) for basic, intermediate, large and very large populations. The harvest management frameworks for supplemented populations is essentially the same framework for natural-origin populations with adjusted harvest rates. The harvest management framework for hatchery mitigation stocks uses the same methodology and break-points as natural-origin populations, but used broodstock management goals as viability.

Pre-season adult abundance estimates will be developed annually for each of the 22 populations and hatchery programs. This will be accomplished using the *United States vs. Oregon* Technical Advisory Committee (TAC) forecasts for upriver spring Chinook, Lower Granite Dam, and Salmon River. The Salmon River forecast will include the number of hatchery and natural-origin adult Chinook salmon, of which will be further defined by FMA.

Once abundance estimates are developed for each FMA, we will apply this information to the harvest management frameworks and develop harvest guidelines. Overall, when abundance is high, harvest is moderate, when abundance is moderate, harvest is low, and when abundance is low, the Tribes and NOAA-Fisheries will determine appropriate actions, which may include a minimal fishery and/or implementation of habitat or hatchery actions. In areas where interception harvest persists, biologists will proportion harvest accordingly.

Our direct take harvest guidelines in the Salmon River sub-basin are considered all inclusive. The Tribes will coordinate their fishery intentions with the relevant co-managers and NOAA-Fisheries, with special emphasis and discussion on areas where multiple agencies elect to open fisheries. Through coordination between the Tribes and co-managers we will work towards accomplishing equitable harvest allocation.

In-season abundance estimates will be updated as necessary and harvest rates modified to adaptively manage harvest as more information becomes available. Fishery monitors and enforcement personnel will initiate a harvest monitoring program using creel surveys to estimate total Tribal harvest for each FMA. The Tribes will curtail a fishery when the harvest objectives are achieved or spawning commences in a broad range of FMAs defined as greater than 25% of the populations.

The Tribes will implement additional monitoring and evaluation not only to ascertain harvest, but to determine overall impacts to the populations and adaptively manage Chinook salmon. Monitoring and evaluation will focus on two primary performance indicators: adult and juvenile abundance. Methods used to estimate adult abundance includes using dam counts, fish traps, sonar, spawning ground surveys, and harvest. Rotary screw traps will be used to estimate juvenile abundance and productivity.

All of the above information will be reported in the Chinook Salmon Harvest Management Program annual report submitted to NOAA-Fisheries and relevant co-managers.

## GLOSSARY

Abundance – quantity, number; relative degree of plentifulness.

Conservation Necessity Principles – conservation standards that must all be met in order for the federal government to impose incidental take restrictions under the ESA on tribal treaty rights.

Critical Level – This plan uses 30% of the Viable Population Threshold as an interim definition – level at which a population can no longer naturally sustain itself.

Consultation – the Tribes believe there are at least two levels of consultation: one is under the ESA; and a broader consultation requirement also exists under the Secretarial Order.

Direct Take – either, if the intent is to take listed fish then the take is direct; or, if the population being fished on is comprised mostly of listed fish, the take is direct.

DNA - (deoxyribonucleic acid) nucleic acids that are the molecular basis for heredity.

Endangered Species – An animal or plant species in danger of extinction throughout all or a significant portion of its range.

ESA – Endangered Species Act of 1973 (16 U.S.C. Section 1531, as amended) is federal legislation that is intended to provide a means to conserve the ecosystems upon which endangered and threatened species depend, and provide programs for the conservation of those species, thus preventing extinction of plants and animals.

ESU – Evoluti onarily Significant Unit - the Distinct Population Segment (DPS) of salmon that are listed under the ESA. A pacific salmonid stock that is substantially reproductively isolated from other stocks of the same species and which represents an important part of the evolutionary legacy of the species.

Extirpated – A species that no longer survives in regions that were once part of its range, but that still exists elsewhere in the wild or in captivity. A few individuals still exist but are far below a viable population threshold.

Fishery (Fisheries) – the occupation, industry or season of taking fish (harvest).

FMA - Fishery Management Area, 22 specific geographic areas for each Salmon River population.

Genetic – the biochemical basis of heredity consisting of DNA and RNA that determine the specific amino acid sequence in proteins and appear to be uniform for all known forms of life.

HCSA – Hells Canyon Settlement Agreement – artificial production agreement to mitigate for losses due to the Hells Canyon Complex. Funds the Pahsimeroi and Rapid River hatcheries.

Hatchery-origin – salmon that were born and raised in a hatchery, then released to migrate to the ocean and return as an adult fish.

Incidental Take – Take that results from, but is not the purpose of, carrying out an otherwise legal activity.

IPC – Idaho Power Company – responsible for two hatcheries (Rapid River and Pahsimeroi) in the Salmon River due to the HCSA.

ICTRT – Interior Columbia Basin Technical Recovery Team. Developed recommendations for salmon and steelhead population delineations, viable population thresholds, ESA recovery gaps, and ESA recovery scenarios for listed salmon species.

LSRCP Lower Snake River Compensation Program – U.S. Fish and Wildlife Service branch that administers funding of mitigation hatcheries in Idaho, Oregon, and Washington to mitigate for losses from the four lower Snake River dams.

NOAA Fisheries- National Oceanic and Atmospheric Administration-National Marines Fisheries Service.

Natural-origin - Salmon that were born and raised in the natural environment regardless of parent origin.

Performance Indicator – the actual item being measured in order to determine if the biological objective is being achieved (e.g., dam counts, rack counts, redd counts, harvest counts, effort counts).

Population – (1a) a body of individuals having a quality or characteristic in common; (1b) the organism inhabiting a particular locality; (2) a group of interbreeding organisms that represents the level of organization at which speciation begins.

Productivity – the rate or trend of abundance over time.

Section 4(d) Rule – A regulation (50 CFR 223, July 10, 2000) developed by NOAA-Fisheries establishing prohibitions that apply for a threatened species. Any prohibitions adopted must be those necessary and advisable to provide for the conservation of the species.

Spatial structure – the rate or trend of abundance over space (geographic area).

Subsistence (see Sustenance).

Supplementation – a management strategy that uses artificial propagation for the purpose of attempting to rebuild depressed natural populations of salmon and steelhead.

Surplus – defined by NOAA-Fisheries for purposes of this document as those adipose fin-clipped hatchery-origin fish that are in excess of recovery needs – the Tribes do not believe there are surplus salmon at this time.

Sustenance – means of support, maintenance, or subsistence of life.

Take – To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or to attempt to engage in any such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Threatened Species – An animal or plant species likely to become endangered within the foreseeable future through all or a significant portion of its range.

TRMP – Tribal Resource Management Plan

*U.S. v Oregon* – Civil No. 68-513 KI. Ratifies the role of the district court judge to intervene as a "perpetual fishmaster" of the Columbia River fisheries to prevent denial of Indian rights.

Viable Population Threshold – population level at which the population will sustain itself.

## INTRODUCTION AND PURPOSE

During the past century, human activity resulted in a continued decline of the once robust runs of salmon and steelhead found within the Salmon River sub-basin. Nearly 95% of the total reduction in estimated abundance occurred prior to the mid-1900s. Over the last 30-40 years, the remaining population has been further reduced to about 0.5% of the estimated historical abundance.

Historically, the Shoshone and Bannock peoples harvested anadromous and resident fish throughout the Columbia River Basin (CRB) for subsistence. The annual anadromous fish runs, in what is now presently Oregon, Washington, Idaho, and Nevada provided harvest opportunities in almost every season and every watershed of the CRB. The Tribes continue to harvest andromous fish under rights reserved by the Fort Bridger Treaty of 1868.

50 CFR 223 allows a tribal government to submit a TRMP with the intent of exempting the tribal harvest of protected species from the ESA. Under the guidance of the Snake River Policy and as directed by the Tribes' Fish and Game Commission, the Fish and Wildlife Department developed this TRMP to implement ESA exempt fisheries on Snake River spring/summer Chinook salmon in the Salmon River.

The TRMP will improve upon our long history of conservative harvest management by incorporating population delineations and VPT (ICTRT 2007). The status of the populations and broodstock management goals were already incorporated into the abundance-based sliding-scale harvest management frameworks.

The TRMP establishes three "8%" harvest management framework templates for basic, intermediate, and large natural-origin populations. Each 8% harvest management framework template identifies five breakpoints. Depending upon the annual forecast; 1) the population forecast is ≤ 30% of VPT, the Tribes will meet to determine an applicable level of harvest with an initial proposal of three fish; 2) population forecast is 30.1% - 50% of VPT, then the harvest rate is 3%; 3) population forecast is 50.1% - 75% of VPT, then the harvest rate is 5%; 4) population forecast is 75.1% - 108% of VPT, then the harvest rate is 8%; and, 5) population forecast is ≥ 108.1%, then the harvest rate is 8% of 108.1% of VPT plus 35% on the remaining margin.

There are five active or planned supplementation programs in the Salmon River. The Tribes will adjust the natural-origin harvest management framework templates for basic, intermediate, and large populations from 8% to 12%, if 2-ocean and/or 3-ocean supplementation adults are expected to return from the program. The Tribes and co-managers will develop an annual forecast for the population consisting of both natural-origin and supplementation adults.

Four hatchery mitigation programs operate in the Salmon River (Rapid River Fish Hatchery, McCall Fish Hatchery, Pahsimeroi Fish Hatchery, and Sawtooth Fish Hatchery) that provide state and tribal fishery benefits. The Tribes will work with the relevant co-managers to develop hatchery forecasts, broodstock management goals, and harvest allocation on an annual basis. The Tribes will implement an 8% harvest management framework when the hatchery return is less than ≤ 139.9% of the broodstock goal. If the hatchery return is more than 140% of the broodstock goal, the Tribes will harvest 50% of the remaining adults above the broodstock goals.

Natural-origin, supplementation, and hatchery Chinook salmon forecasts will be made annually and adjusted as appropriate in-season. Tribal fishery regulations and guidelines will be adopted and inter-agency coordination meetings will address co-management harvest concerns. The Tribes will monitor and evaluate the Chinook salmon fisheries to determine overall catch and impacts to the natural populations.

**Goal**

The goal of the TRMP is to provide population specific harvest management of Chinook salmon in a manner that promotes recovery of the listed species while protecting, preserving, and enhancing rights reserved under the Fort Bridger Treaty and any inherent rights.

**Objectives and Tasks**

**Objective 1a. Develop an abundance-based sliding-scale harvest management framework using an 8% table for natural-origin populations categorized as basic, intermediate, and large.**

**Objective 1b. Develop an abundance-based sliding-scale harvest management framework using a 12% table for supplemented natural-origin populations, categorized as basic, intermediate, and large.**

**Objective 1c. Develop an abundance-based sliding-scale harvest management framework for hatchery mitigation programs.**

**Objective 2. Develop a method to estimate adult escapement for natural-origin, supplementation, and hatchery adult Chinook salmon returning to 22 FMAs.**

**Objective 3. Develop adult Chinook salmon escapement estimates for 22 FMAs with.**

*Task 3.1. Develop Columbia River mouth upriver spring Chinook salmon forecast (January).*

*Activity 3.1.1. Assist TAC with development of Columbia River mouth natural and hatchery Snake River spring/summer Chinook salmon forecast (January).*

*Activity 3.1.2. Assist TAC with development of Columbia River mouth natural and hatchery Upper Columbia spring Chinook salmon forecast for (January).*

*Activity 3.1.3. Utilize Zones 1-5 harvest estimates and Bonneville Dam counts to validate Columbia River mouth forecast; update forecast as necessary.*

*Task 3.2. Utilize Columbia River mouth upriver spring Chinook salmon forecast to develop forecast for Lower Granite Dam (February).*

*Activity 3.2.1. Utilize Lower Granite Dam count to validate forecast; update forecast as necessary.*

*Task 3.3. Utilize Lower Granite Dam Chinook salmon forecast to develop forecast for 22 FMAs (March-April).*

*Task 3.4. Utilize PIT data collected at Bonneville and Lower Granite dams to refine forecasts for Snake River spring/summer Chinook salmon.*

**Objective 4. Apply adult forecast to the abundance-based sliding-scale harvest management frameworks and develop population specific harvest guidelines.**

*Task 4.1. Apply natural-origin adult Chinook salmon forecast to the natural-origin harvest management framework and set population specific fishery targets (May).*

*Task 4.2. Apply supplementation adult Chinook salmon forecast to the supplementation harvest management framework and set population specific fishery harvest targets (May).*

*Task 4.3. Apply hatchery adult Chinook salmon forecasts to the hatchery harvest management framework and set population specific fishery harvest targets (May).*

*Task 4.4. Determine harvest levels when run sizes for any given population fall below 30% VPT, through government to government consultation with NOAA-Fisheries (May).*

*Task 4.5.* *Communicate the Tribes fisheries intentions with the relevant co-managers and incorporate harvest allocations, if agreeable to Commission (May).*

*Task 4.6.* *Provide opportunity for Tribal member public comment on proposed fishery guidelines (May).*

*Task 4.7.* *Provide draft Chinook salmon fishing guidelines to Commission for approval (May).*

*Task 4.8.* *Submit annual harvest guidelines to NOAA-Fisheries (May).*

*Task 4.9.* *Notify co-managers, NOAA-Fisheries, and Tribal fishermen of any modifications to the Chinook salmon regulations and guidelines.*

**Objective 5.** **Implement harvest monitoring program to provide accurate and precise estimates of harvest.**

*Task 5.1.* *Develop a protocol for monitoring and evaluation Chinook salmon fisheries.*

*Task 5.2.* *Schedule annual meeting with fishery monitors and enforcement to discuss data collection, analysis, and reporting requirements.*

*Task 5.3.* *Collect efforts, hours per effort, fish caught per effort, fish released per effort, indirect mortality, gear used, area, and time (seasonal).*

*Task 5.4.* *Partition harvest accordingly in FMAs where multiple populations can be intercepted.*

*Task 5.5.* *Estimate total Tribal harvest for each population with statistical valid estimates (May-August).*

*Task 5.6.* *Obtain population specific harvest estimates from other treaty and non-treaty fisheries and determine whether equitable harvest was achieved.*

**Objective 6.** **Determine total adult abundance for each population.**

*Task 6.1.* *Use picket weirs in Yankee Fork, Panther Creek and Lemhi River and sonar in Big, Loon, Marsh, Bear Valley, Valley Creek to obtain adult escapement estimate; request adult data from existing program collected in Little Salmon, Secesh, East Fork South Fork, South Fork, Pahsimeroi, East Fork, and Salmon River Upper Main.*

*Task 6.2.* *Complete spawning ground surveys as necessary to obtain escapement estimates; this will include a detailed summary of existing programs, areas covered, and data limitations.*

**Objective 7. Monitor and evaluate juvenile abundance and productivity.**

*Task 7.1.* *Install and o perate rotary screw traps in Camas, Loon, Bear Valley, North Fork, and Yankee Fork.*

*Activity 7.1.1.* *Estimate emigrating Chinook salmon fry, parr, pre-smolt and smolt.*

*Activity 7.1.2.* *Use mark-recapture method to determine trap efficiency as conditions change.*

*Activity 7.1.3.* *Utilize PIT tags to determine population survival to Lower Granite Dam using SURPH model.*

**Objective 8. Increase non-monetary social benefits.**

*Task 8.1.* *Measure Tribal member participation in fishermen's meetings.*

*Task 8.2.* *Measure Tribal member Chinook salmon fishing efforts.*

**Objective 9. Communicate findings to NOAA-Fisheries.**

*Task 9.1.* *Complete annual report and provide to NOAA-Fisheries and relevant co-managers.*

**Authorities**

The ESA (16 USC 1531-1543) establishes the basic authority for the protection of listed species of plants and animals. Section 4(d) prohibits take without ESA authorization and requires NOAA-Fisheries to issue regulations deemed necessary and advisable to provide for the conservation of the species. If tribal, private, local, state, or federal programs do not interfere with the long-term survival and recovery of a species, they can be authorized under Section 4(d) of the ESA. Section 4(d) is available only for threatened species.

The Tribes reserved the right to hunt anadromous and resident fish under the Fort Bridger Treaty of July 3, 1868. Article IV reserved the right to hunt on the unoccupied land of the United States and was construed to include the right to fish (*State v Tinno,* 94 Idaho 759, Supreme Court of Idaho, June 8, 1972).

*The Indians herein named agree ... they shall have the right to hunt on the unoccupied lands of the United States so long as game may be found thereon, and so long as peace subsists among the whites and Indians on the borders of the hunting districts. (Article IV).*

The 1975 Tribal Game Code provides jurisdiction over Tribal members hunting, fishing, trapping, and gathering resources on and/or off the Fort Hall Indian Reservation under the Fort Bridger Treaty of 1868. Tribal management guidance is provided by annual regulations carried out by the directives of the 1975 Game Code.

**Policy Statement**

The Tribes developed a policy statement to provide for management guidance of Snake River sub-basin resources in 1994 (Shoshone-Bannock Tribes 1994).

*The Tribes will pursue, promote, and where necessary, initiate efforts to restore the Snake River system and affected unoccupied lands to a natural condition. This includes the restoration of component resources to conditions that most closely represent the ecological features associated with a natural riverine ecosystem. In addition, the Tribes will work to ensure the protection, preservation, and where appropriate the enhancement of rights reserved by the Tribes under the Fort Bridger Treaty of 1868 and any inherent aboriginal rights.*

**Treaty Trust Obligations**

The Department of Commerce has a trust obligation to carry out their statutory mission in a manner that harmonizes tribal sovereignty and treaty rights so as to minimize the potential for conflict and ensure tribes do not bear a disproportionate burden for the conservation of listed species. The federal government has a trust responsibility to protect the Tribes right to harvest and/or gather natural resources and protect endangered species. Section 4(d) rule improves Tribal management of natural resources.

Principle 3(c) of the Secretarial Order #3206, "American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act," provides the following Conservation Necessity Principles required by any federal restriction on treaty harvest.

i) The restriction is reasonable and necessary for the conservation of the species at issue;
ii) The conservation purpose of the restriction cannot be achieved by reasonable regulation of non-Indian activities;
iii) The measure is the least restrictive alternative available to achieve the required conservation purpose;

iv) The restriction does not discriminate against Indian activities, either as stated or applied; and,

v) Voluntary tribal measures are not adequate to achieve the necessary conservation purpose.

This TRMP will balance statutory conservation requirements with tribal rights and the federal trust responsibility as directed by Section 4(d). The Tribes are confident the Secretary of Commerce will determine implementation of this TRMP will not appreciably reduce the likelihood of survival and recovery of the listed species; and therefore, exempt the Tribes direct take or harvest from the prohibition of take under the ESA.

## HISTORICAL BACKGROUND

**The Rivers and Fisheries of the Shoshone-Bannock Peoples** – taken from Albers et al. 1998.

In historic times, the Shoshone and Bannock speaking peoples lived at the headwaters of four major river systems in the western United States. They intensively utilized and traveled the rivers and tributaries of the Salmon and Snake, which in turn feed the CRB, but they also spent time on watercourses leading to the Great Basin as well as the Missouri and Colorado Rivers. Many descendents now live on or near the Fort Hall Indian Reservation in southeast Idaho.

The Shoshone and Bannock peoples maintained lifestyles which were closely and continuously adapted to the pulse of the riverine environments where they lived and traveled; clearly indicating that the Shoshone and Bannock peoples were fishers who relied, in one degree or another, on the anadromous fish species of the CRB.

The importance of fishing to the historic Shoshone and Bannock peoples is also corroborated in archeological sources (Holmer 1986, Plew 1983, Swanson et al. 1970), but it was not until 1805 that the first European-American observations of Shoshone and Bannock fisheries and fishing practices appeared in the historic record. From this date until 1879, there is a continuous record of eyewitness accounts which describe the prominence of fishing in Shoshone and Bannock subsistence (Figure 1).

Historic and ethnographic sources reveal that the most intense fishing took place from April to September, when salmon and other anadromous species ascended the Salmon River to its headwaters and the Snake River to Shoshone Falls. On the Lemhi River, where the conditions for fishing were especially favorable, "salmon," according to Sven Liljeblad (1957), were "their principal source of Livelihood." Salmon were taken during the spring, summer, and fall runs on the Lemhi River, and one variety was also caught on the Salmon River in winter and on its tributary streams where they spawned in March (Steward 1970, Thwaites 1959). In addition, the *Newe* of the Salmon River region were reported to procure at least nine other species of fish including lamprey, suckers, and trout.

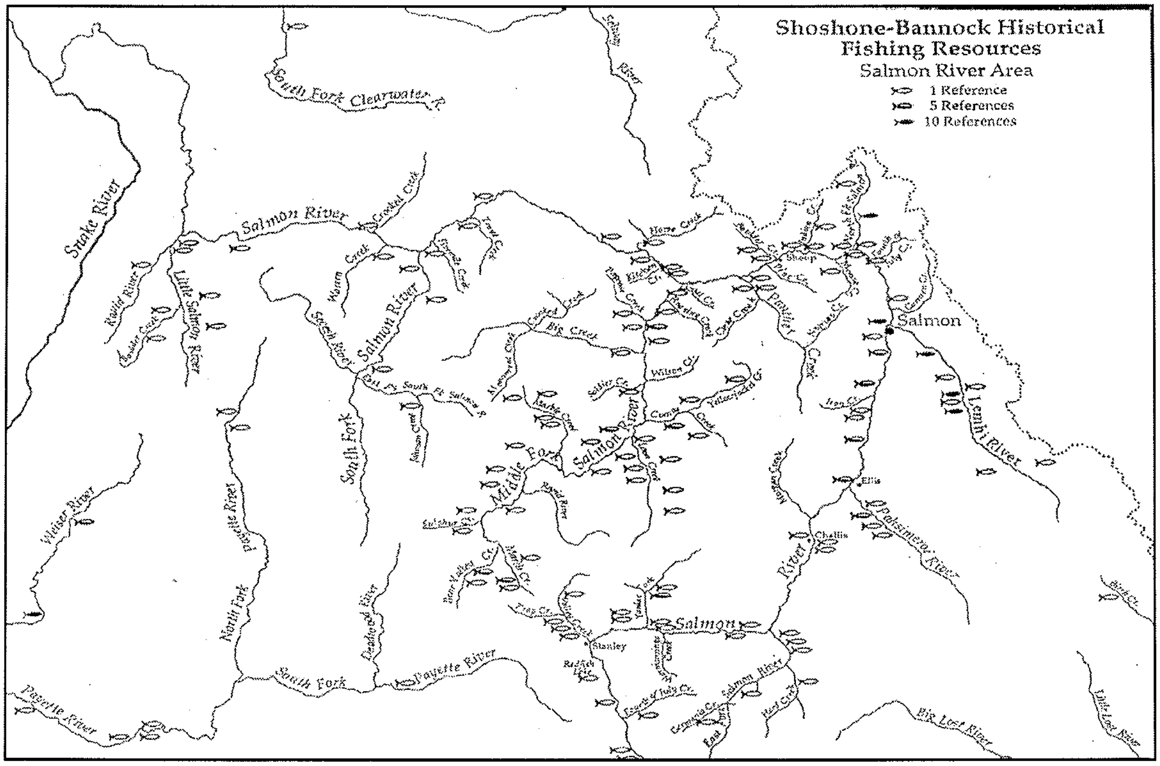


**Figure 1. Shoshone-Bannock fishing locations documented by historical references in central-Idaho (Albers et al. 1998).**

One of their major winter camping grounds was located at *Pa:dai,* and it consisted of a series of sites at the confluence of the Lemhi and Salmon Rivers (modern Salmon, Idaho). In 1805, Shoshone and Bannock encampments and fishing sites were also reported along the Lemhi, and they were regularly noted in the vicinity of the present day town of Tendoy in the 1850s. The journals of the Lewis and Clark Expedition also noted several settlements and fishing locations on tributaries of the main Salmon as far as the North Fork. Another popular area for fishing and occupation was situated along the lower reaches of the Pahsimeroi in an area also called *Pasimadi* (Mink 1997).

The centrality of anadromous fishing to the Shoshone and Bannock subsistence economy persisted much longer on the Salmon and its tributaries than anywhere else in Idaho (Liljeblad 1957 & 1959). This was due, in part, to the presence of a reservation in the Lemhi-Salmon area until 1907, but it was also a consequence of the many Shoshone and Bannock who stayed in this region to work as farm hands on local ranches and to perform various kinds of wage-work in local towns and mines.

In later years, as the upstream return of salmon was obstructed on the Snake River and its tributaries above Hells Canyon, more and more Shoshone and Bannock from Fort Hall turned to the Salmon River drainage as a location to fish. Popular fishing areas noted in oral histories include, among many others, the Salmon River near Ellis, the Lemhi, Yankee Fork, East Fork, Middle Fork, Pahsimeroi, Redfish Lake, and Bear Valley Creek (Cawson 1950). Also, the continuing importance of the Salmon River fisheries to modern day Shoshone-Bannock is clearly evident in the testimony of tribal members who appeared in the trial of the *State of Idaho v. Gerald Tinno.*

**Shoshone-Bannock Reliance on Anadromous Fish Resources** – taken from Walker 1992.

Several methods have been employed by scholars and scientists to estimate both the amount of fish traditionally available and the amounts traditionally harvested by the tribes of Idaho including the Shoshone-Bannock Tribes. It has been estimated by Rostlund, Hewes and Walker, the Shoshone and Bannock people's average annual fish harvest for the Salmon River region was 233,555 fish (range 36,500-604,166). This is based on several methods of estimating historical catch information and assumes 15 pounds per fish.

One of the earliest and most enduring studies of fish populations and harvests in Native North America was completed by Erhard Rostlund in 1952 and published as "Freshwater Fish and Fishing in Native North America." Assuming Rostlund's method is correct, the home territory of the Tribes which includes 10 million square acres or about 15,625 square miles, the Tribal catch derived by Rostland would be 9,062,500 pounds. At an average weight of 15 pounds per fish, this equates to 604,166 total fish.

A different method was used by Hewes in his 1947 "Aboriginal Use of Fishery Resources in Northwestern North America." By this method, a tribal population of 1,000 would consume 1,000 pounds per day or 365,000 pounds per year. The Shoshone and Bannock population of southern and central Idaho probably exceeded 5,000 which would produce an average annual catch of 1,825,000 pounds. By apportioning 1,500 of this 5,000 total Shoshone and Bannock peoples to central-Idaho (Salmon River region), the Hewes method would yield an average annual catch of 547,500 pounds, a figure close to the estimate made by Walker. At an average weight of 15 pounds per fish, this equates to 36,500 total fish.

Another method used for estimating Shoshone and Bannock subsistence harvest, typical of central Idaho during the mid-19$^{th}$ century is the direct comparison of harvest of fish and game in Alaska. The Alaskan research indicates that contemporary hunting and gathering ranged as high as 1,498 pounds of fish and game per person per year with an estimated annual average throughout Alaska of 250 pounds (dressed weight). About 65% of the harvest was found to be fish with such species at salmon, halibut, herring, whitefish, cod, and artic char. Also resembling the Columbia system during the latter nineteenth century, ninety-five percent of the total fish harvest in Alaska is now taken by the commercial harvest.

Although we cannot compare specific Alaska communities with the Shoshone-Bannock, we can use the Alaskan survey data to help validate ranges of historic Shoshone-Bannock fish consumption. For example, 65% of the Alaskan high estimate is 973.7 pounds of fish per person per year, a figure within the range of estimates for tribal groups of the Columbia River system.

Walker (1993) further improved fish consumption estimates for the Shoshone-Bannock. Walker used more empirical methods as a first step in estimating Shoshone-Bannock reliance on fish resources in the Salmon River country. Walker (1993) grouped the Shoshone-Bannock fishing sites into three broad types: fishing sites at natural falls, cascades, or rapids; those constructed as weirs, traps, and fish walls, and the simple fishing site commonly utilized without any such distinguishing features. The first two types are by far the most productive sites and are capable of daily harvests in the hundreds and even thousands of fish during certain peak days of the fish runs. Walker (1993) located about 50 such sites. The third type is not usually employed during peak days of the anadromous fish runs and is used in an opportunistic manner for both anadromous and resident species. Walker estimates Shoshone-Bannock harvest in the Lemhi/Salmon River region to be 200 fish per day, per weir, averaging 15 pounds each. This yields a potential average annual harvest of 900,000 pounds, or about 60,000 fish.

## SUB-BASIN LOCATION – taken from Salmon Subbasin Assessment (NPPC 2004)

### General Description

The Salmon River sub-basin is unique in the CRB as it supports a diverse group of some of the region's more important wild, indigenous salmonid populations. Many of these populations reside in habitat strongholds within the sub-basin's large areas of designated wilderness and roadless areas. These vast protected wilderness areas are a unique feature of the sub-basin. For example, public lands account for over 91% of the land area of the sub-basin, and The Frank Church - River of No Return Wilderness Area, one of the five within the sub-basin, is the largest wilderness area in the contiguous United States. These large protected areas provide refuge not only for wild salmonids, but also serve as habitat strongholds for wildlife, some of which are imperiled or absent across much of their historic range.

Historically, the Salmon River sub-basin provided more spawning area than any other sub-basin in the CRB, producing 39% of the spring Chinook and 45% of the summer Chinook and 25% of the summer steelhead returning to the mouth of the Columbia River (Mallet 1974). A recent broad-scale assessment of the entire CRB ecosystem (ICBEMP 1997) found that the Salmon sub-basin provides a core of remaining connected habitat for five species of salmonids: bull trout, westslope cutthroat trout, redband trout (sympatric with steelhead), stream-type Chinook salmon, and summer steelhead (Thurow et al. 2000). The sub-basin contains critical habitat for Snake River spring/summer Chinook Salmon, Snake River sockeye salmon, Snake River steelhead, and bull trout listed under the ESA and large connected habitats for Pacific lamprey, white sturgeon, and a variety of other native nongame fishes.

## Geographic Area

The Salmon River sub-basin lies within the northern Rocky Mountains of central-Idaho and encompasses 22 major tributaries (Figure 2). The Salmon River flows 410 miles north and west through central-Idaho to join the Snake River in lower Hells Canyon. The sub-basin is one of the largest in the CRB and encompasses some of its most pristine terrestrial and aquatic temperate montane ecosystems.

The sub-basin is characterized by an intricate mosaic of moderate to high elevation mountain ranges combined with deeply cut valleys of the Salmon River Mountains. The western portion of the sub-basin encompasses the northern Seven Devils Mountains and the southern fringe of the Palouse Prairie region. The southeastern portion of the sub-basin is punctuated by the high alpine ridges of the Lost River and Lemhi ranges, parallel block fault ranges characteristic of basin-and-range terrain of the Great Basin. Elevation within the sub-basin ranges from 12, 662 feet on the summit of Mount Borah down to 900 feet at the mouth of the Salmon.

## Physical Description

### *Drainage Area*

The sub-basin covers approximately 14,000 square miles, 16.7 percent of the land area of Idaho, and six percent of the land area of the CRB. The sub-basin has nearly 1,700 named streams with a combined length of nearly 17,000 stream miles. These streams flow from headwaters in the Sawtooth, Lost River, Lemhi, Beaverhead, and Salmon River mountain ranges to the mouth of the Salmon River at its confluence with the Snake River in lower Hells Canyon.

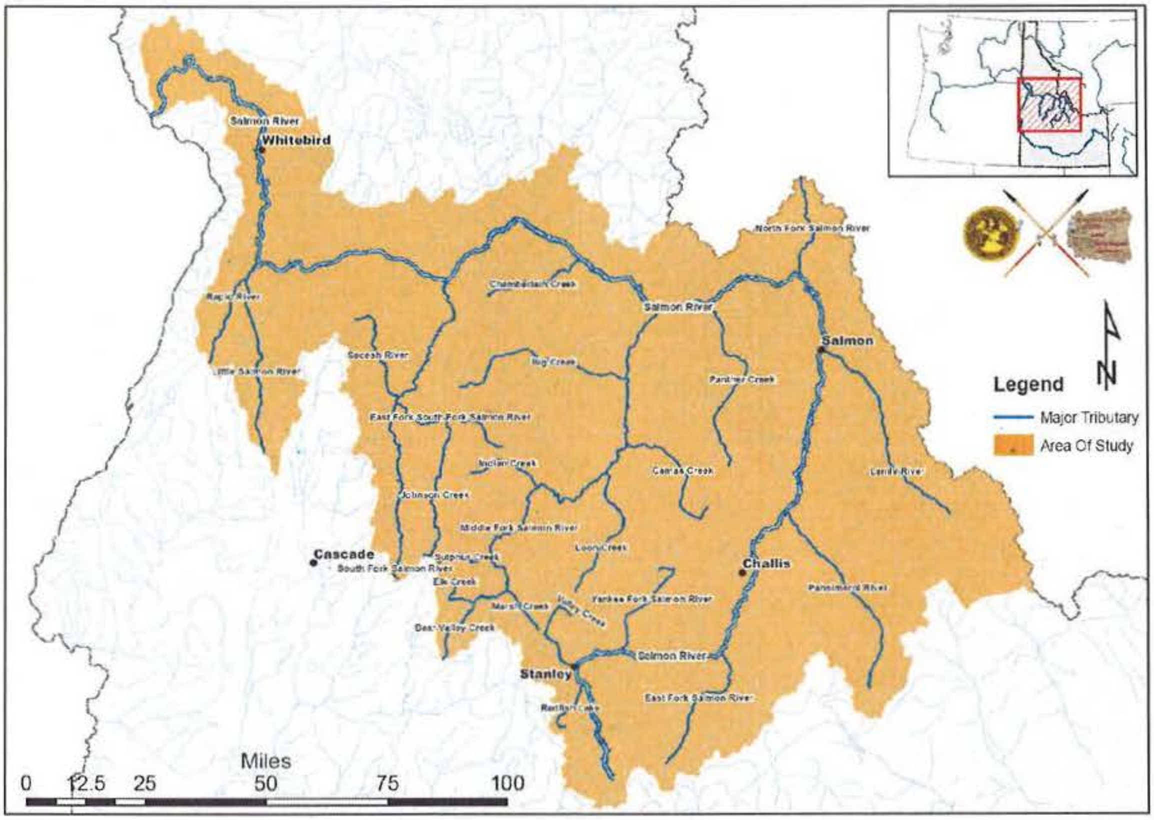


**Figure 2. Major tributaries within the Salmon River basin, Idaho.**

*Geomorphology*

The sub-basin lies within the Northern Rocky Mountain and Columbia Intermontane geomorphic provinces. Key geologic features within the sub-basin are the Idaho Batholith, Challis Volcanics, and the Quaternary alluvial deposits of the Pahsimeroi and Lemhi valleys. Soils derived from these parent materials are typically highly erodible. The combination of these soils, steep topography, and climatic stresses give rise to significant base surface erosion, slumping, and debris avalanche hazards (Megahan 1975).

Quaternary glaciation occurred primarily on isolated high elevation peaks. Major alpine glacier systems formed in the Sawtooth Range, White Cloud Peaks, and Boulder Mountains, and to a lesser extent, the Lost River and Lemhi ranges. Large scale glacially derived physiographic features (e.g., broad U-shaped valleys) are prominent in the upstream portions of the Upper Middle Fork, Upper Salmon, and Lemhi watersheds. Localized evidence of alpine glaciation (e.g., pothole lake systems and glacial cirques) is common and dispersed throughout the sub-basin on upper slope and ridge top positions of higher elevation ridge systems. Stream erosion, however, has played the predominant role in shaping the physiography of the sub-basin. Stream erosion since the Middle Tertiary has given rise to a topography characterized by relatively narrow, V-shaped valleys, steep valley side slopes, and relatively narrow ridge systems. The geomorphology of the eastern Upper Salmon, Pahsimeroi, and Lemhi watersheds is a dramatic exception to the proceeding discussion. The sub-parallel block fault ridges of the Lost River and Lemhi ranges represent the northernmost extent of Basin and Range terrain (so predominant to the south in the Great Basin). In this portion of the sub-basin, high mountain peaks rise rapidly from broad, gentle valleys.

*Climate*

The sub-basin has a broad climatic gradient, from the prevalence of a Pacific maritime regime in the west to a continental regime in the east. The Pacific maritime-influenced climate of the western portion of the sub-basin is primarily affected by the seasonal movement of two opposing weather systems. From the late fall to early spring months, the climate is influenced by cool and moist Pacific maritime air. Periodically, this westerly flow of air is interrupted by outbreaks of cold, dry, continental air from Canada normally blocked by mountain ranges to the east. During the summer months, the westerly winds weaken, and a Pacific high pressure system becomes dominant, resulting in decreased precipitation, and more continental climatic conditions. The region is generally characterized by warm summers and mild or cool winters. Across much of the sub-basin, most precipitation occurs as snow during winter and summers are comparatively dry.

The eastern-most portion of the sub-basin is characterized by warm summers and cold winters. Mean annual precipitation is typically one-half the amount received in the west. The Salmon River Mountains and Sawtooth Range create a rain-shadow effect, allowing only an occasional influx of moisture laden winter air from the Pacific. Precipitation patterns in the rain-shadow, which predominate in the Pahsimeroi and Lemhi watersheds, differ from those found across the rest of the sub-basin. In these areas, precipitation frequently occurs in the early summer when convective showers are common; winters are relatively dry.

Geographic differences in the seasonal distribution of precipitation influence the characteristics of terrestrial and aquatic habitats. When snowpack is low, anadromous fish in irrigated portions of the sub-basin are affected by stream dewatering and elevated summer temperatures. Occasionally, lengthy frontal rain storms can produce as much as 10 inches of precipitation. These events are a critical factor in flooding and landslides during winter and spring (Platts 1974). Some areas are snow covered for more than eight months of the year while other areas receive only minor amounts. Above 4,000 feet, most of the annual precipitation occurs as snow with maximum accumulation occurring by about the first week in April.

*Hydrology*

The mean annual flow of the Salmon River at White Bird, the US Geological Survey gauging station closest to the mouth, is 11,300 cubic feet per second (cfs). The drainage area of the sub-basin upstream from this station is 13,550 $mi^2$, or 97% of the entire area of the sub-basin. This equates to a mean annual discharge from the sub-basin of approximately 0.83 $cfs/mi^2$.

In general, stream flows peak in spring and recede to considerably lower levels in summer, fall, and winter (Figure 3). High flows are strongly dependent on snowmelt in most areas, and peaks are generally reached earliest in lower elevation catchments. Spring-time flows in the lower river reaches of the Lemhi and Pahsimeroi Rivers are different than those found in the other major tributaries, and reflect a high rate of water diversion for irrigation purposes as well as differences in geology and levels of precipitation at the eastern edge of the sub-basin. Flows in the lower Lemhi River reach particularly low levels in the summer and fall.

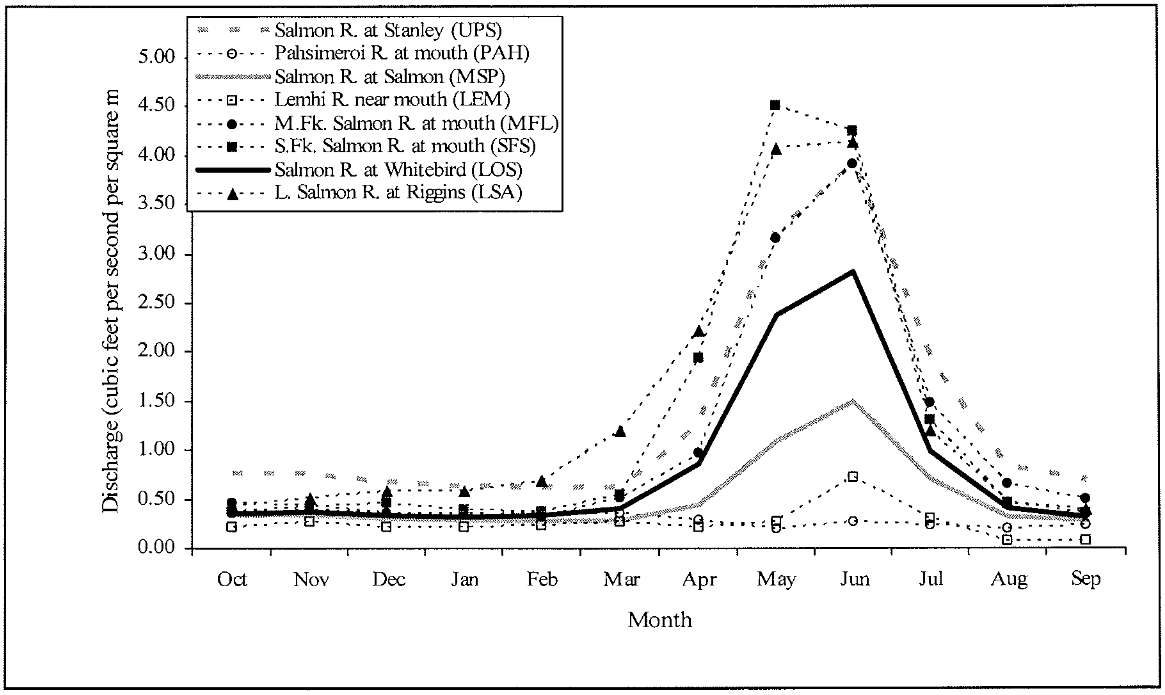


**Figure 3. Seasonal patterns in streamflows for the periods of record at eight gauging stations on rivers within the Salmon River basin, Idaho (data source: USGS). Flows at gauge sites have been normalized to drainage area for comparative purposes.**

### *Ownership and Land Use Patterns*

Public lands account for approximately 91% of the sub-basin, with most of this being in federal ownership and managed by seven National Forests and Bureau of Land Management (Figure 4). Public lands within the sub-basin are managed to produce wood products, forage for domestic livestock, and mineral commodities, and to provide recreation, wilderness, and terrestrial and aquatic habitats. Approximately nine percent of the sub-basin land area is privately owned.

Land management practices within the sub-basin vary among landowners. The greatest proportion of National Forest lands are federally designated Wilderness Areas or are areas with low resource commodity suitability. One third of the National Forest lands in the sub-basin are managed intensively for forest, mineral, or range resource commodity production. Bureau of Land Management lands in the sub-basin are managed to provide domestic livestock rangeland and habitats for native species. State of Idaho endowment lands within the sub-basin are managed for forest, mineral, or range resource commodity production.

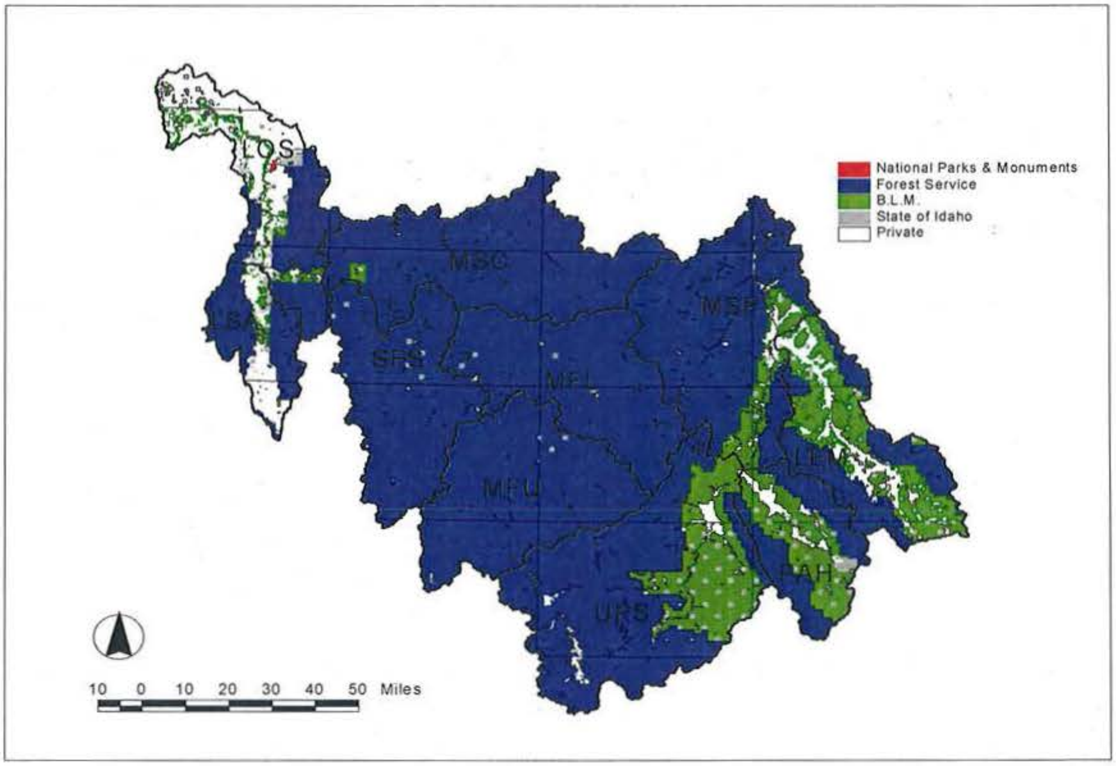


**Figure 4. Land ownership patterns within the Salmon River basin, Idaho.**

## ENDANGERED SPECIES ACT

Under this TRMP, the Tribes will harvest natural-origin Snake River spring/summer Chinook Salmon within the Salmon River sub-basin. Implementation of this TRMP will not likely jeopardize other listed species including Snake River steelhead, Snake River Sockeye salmon, and Bull Trout, but will likely result in incidental impacts. Snake River fall Chinook will not be impacted by this TRMP and warrant no further discussion.

### Snake River Spring/Summer Chinook Salmon

Chinook salmon were listed under the ESA as threatened on April 22, 1992 (57 FR 14653) and this order was corrected June 3, 1992 (57 FR 68543). An emergency reclassification was published on August 18, 1994, (59 FR 42529) and expired twelve months later. In 2005, the status of Snake River spring/summer Chinook salmon was reaffirmed as threatened (50 CFR 223 & 224).

Prior to these rulings, hatchery produced fish were not provided ESA protections. NOAA-Fisheries clarified that hatchery stocks are included in an Evolutionarily Significant Unit (ESU) if it is determined that they are not reproductively isolated from populations in the ESU, and they are representative of the evolutionary legacy of the ESU (70 FR 37160). Hatchery stocks are considered representative of the evolutionary legacy of an ESU, and hence included in the ESU, if it is determined that they are genetically no more than moderately divergent from the natural population. If a hatchery stock is more divergent from the local natural population, this indicates that the hatchery stock is reproductively isolated from the ESU.

For threatened salmon and *O. mykiss* ESUs, Section 4(d) protections are applied to natural and hatchery fish with an intact adipose fin, but not to listed hatchery fish that have had their adipose fin removed prior to release into the wild. Many hatcheries produce fish that are not part of a listed ESU, while others produce fish that are part of a listed ESU but are surplus to conservation and recovery needs, for the purpose of contributing to sustainable fisheries. With their adipose fin removed, non-listed and surplus listed hatchery fish can be visually distinguished from listed fish requiring protection for conservation and/or recovery purposes. Exempted from take prohibitions, adipose-fin-clipped hatchery fish can be harvested in fisheries, including but not limited to mark selective fisheries that have appropriate ESA authorization. In addition to adipose-fin-clipped hatchery fish, other listed hatchery fish (with intact adipose fins) that are surplus to the recovery needs of an ESU and that are otherwise distinguishable from naturally spawned fish in the ESU (*e.g.*, by run timing, location, or other marking methods) may be exempted from the section 4(d) protections under the available limits (70 FR 37160) (Table 1).

**Table 1. List of all active Salmon River basin artificial propagation programs and whether they are included in Evolutionary Significant Units (ESUs) of West Coast Salmon.**

| ESU and Artificial Propagation Program | Included | Location (Idaho) |
|---|---|---|
| Snake River Sockeye salmon ESU | | |
| *Redfish Lake Captive Propagation Program* | *Yes* | *Stanley Basin Lakes* |
| Snake River Spring/summer Chinook Salmon ESU | | |
| *McCall Fish Hatchery* | *Yes* | *South Fork Salmon River* |
| *Johnson Creek Artificial Propagation Enhancement* | *Yes* | *East Fork South Fork Salmon River* |
| *Pahsimeroi Fish Hatchery* | *Yes* | *Pahsimeroi River* |
| *Yankee Fork Chinook Salmon Supplementation Program* | *Undetermined* | *Yankee Fork Salmon River* |
| *East Fork Captive Rearing Experiment* | *Yes* | *East Fork Salmon River* |
| *West Fork Yankee Fork Captive Rearing Experiment* | *Yes* | *Yankee Fork Salmon River* |
| *Sawtooth Fish Hatchery* | *Yes* | *Upper Salmon River* |
| *Rapid River Fish Hatchery* | *No* | *Little Salmon River* |

**Snake River Steelhead**

Snake River steelhead adults are generally not present in the Salmon River during the Tribes' Chinook salmon fisheries. Snake River steelhead were listed on October 17, 1997 (50 CRF 222 and 227). No legal distinctions were made between A-run and B-run summer steelhead. Resident rainbow trout are not protected under this rule. Tribal biologists estimate that steelhead by-catch is less than 10 adults per year and occurs in Yankee Fork, East Fork and Salmon River Upper Main FMAs. However, we will initiate a creel census and reporting system to estimate incidental impacts to steelhead. Incidental impacts to steelhead will be included in our annual report to the NOAA-Fisheries.

**Snake River sockeye salmon**

In November 1991, Snake River sockeye salmon were listed as endangered under the ESA (56 FR 58619). The listing was in response to the Shoshone-Bannock Tribes' petition submitted to NMFS in March of 1990. This petition was seen as the last chance to stimulate a positive change to the otherwise doomed population of the sockeye salmon.

The Tribes harvest monitors have not recorded any sockeye salmon harvest by tribal members since initiation of monitoring in 1979. Sockeye salmon are not a target species of the Tribes' TRMP. The Tribes will manage Chinook salmon harvest to minimize incidental impacts to sockeye salmon to the greatest extent possible.

Mainstem Columbia River tribal fisheries impact Snake River sockeye salmon. The Tribes recognize the unique situation of Snake River sockeye salmon and will ensure proper monitoring and evaluation, information and education occurs whenever the potential for incidental take exists. The Tribes will estimate the number of returning adult sockeye salmon and determine an incidental impact rate limit of 1% of the expected return.

Snake River sockeye salmon typically cross Lower Granite Dam from as early as June 22 through August 27 (Figure 5). Sockeye salmon are destined for the Sawtooth Valley Lakes in central Idaho in early August and migrate through nine Chinook salmon FMAs. The run-timing of sockeye salmon will overlap with late-time returning adult spring/summer Chinook salmon. Tribal harvest of Chinook salmon may not be curtailed while Snake River sockeye are returning and we expect the only area where sockeye salmon may be incidentally taken may occur in the Salmon River Upper Main FMA.

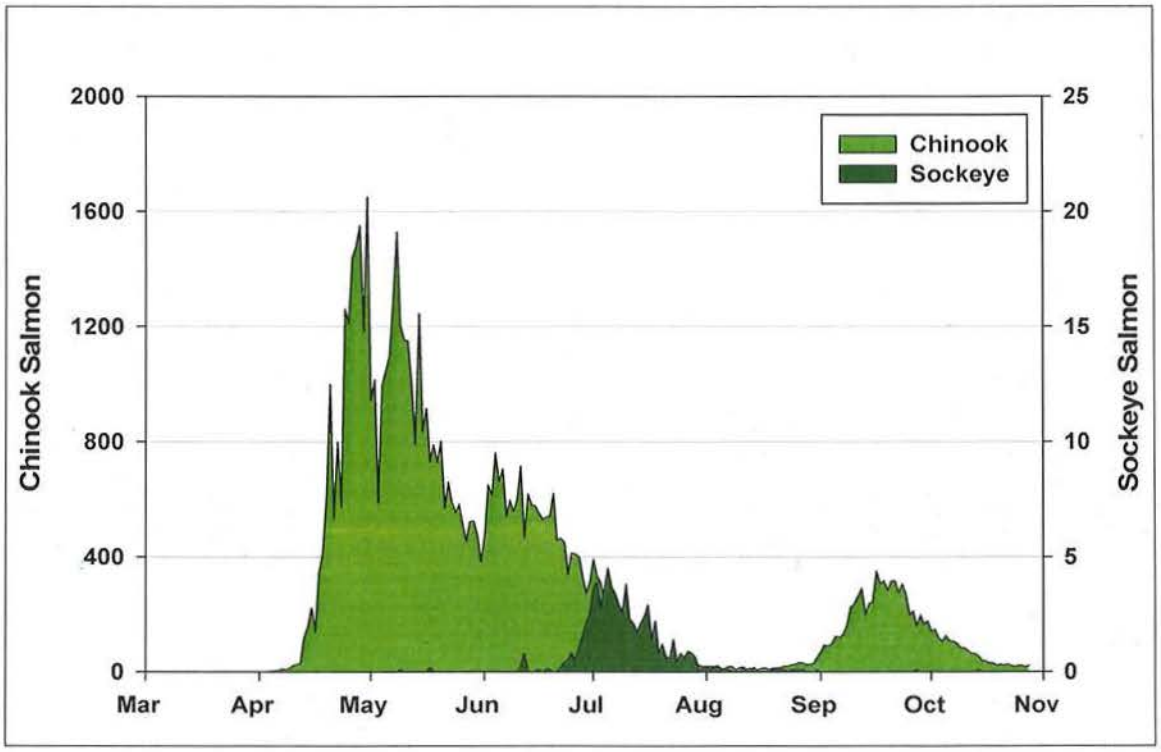


**Figure 5.** **Run timing from 1998-2008 for Chinook and sockeye salmon crossing Lower Granite Dam (data provided by Fish Passage Center).**

### Critical Habitat

Critical habitat was designated on December 28, 1993 for Snake River spring/summer and fall Chinook and Snake River sockeye salmon (58 FR 68543). Critical habitat for Snake River spring/summer Chinook salmon was revised on October 25, 1999 (64 FR 57399). Critical habitat was designated on February 16, 2000 for the Snake River Steelhead ESU (65 FR 7764). Bull trout critical habitat was designated on June 10, 1998 (63 FR 31647).

The activities considered in this consultation (i.e. fishing, camping, monitoring and evaluation) will not result in the destruction or adverse modification of any of the essential features of the critical habitat designations listed above. Tribal management of the fisheries is intended to protect, preserve and enhance natural resources.

### Bull Trout

Columbia River bull trout were federally listed as a threatened species on June 10, 1998 (63 FR 31647). Bull Trout are not a target species of the TRMP. Tribal fishermen may incidentally harvest adult bull trout in the Salmon River, while fishing for Chinook salmon. Tribal biologists estimate that bull trout catch is less than 20 adults per year. We will initiate a creel census and reporting system to estimate incidental impacts to Bull Trout.

Incidental take of bull trout by SBT fishermen will require consultation with the USFWS. Because bull trout are not a target species during the Chinook salmon fishery, SBT will seek exception to prohibition of take under a different process with the USFWS (Section 6 Agreement). The bull trout consultation will have to be coordinated with NOAA Fisheries review of the TRMP, and the result of consultation will be included as a component of the annual Fishery Implementation Plan (FIP). Incidental impacts to Bull Trout will be included in our annual report and submitted to the USFWS and NOAA-Fisheries.

## HATCHERY PROGRAMS

The fisheries proposed under this TRMP include hatchery stocks located in the Salmon River sub-basin. The mitigation hatcheries include the Rapid River Fish Hatchery, McCall Fish Hatchery/South Fork Salmon River satellite facility, Pahsimeroi Fish Hatchery, and Sawtooth Fish Hatchery. The supplementation programs include Johnson Creek Artificial Propagation Enhancement (JCAPE), Yankee Fork Chinook Salmon Supplementation (YFCSS) Program, and Salmon River Captive Rearing Initiative. Hatchery-origin Chinook salmon produced by the Rapid River Fish Hatchery are not listed and warrant no ESA protections. All other hatchery-origin fish are listed, but surplus to recovery.

The Tribes plan to address hatchery reform, sub-basin plans, salmon and steelhead recovery plans, and the Columbia Basin Fish Accords in this TRMP and will consult with NOAA-Fisheries and the co-managers to address any modifications to artificial propagation in the Salmon River basin.

### Lower Snake River Compensation Plan

The Lower Snake River Compensation Plan (LSRCP) program was authorized by the Water Resources Development Act of 1976 and 1986 to mitigate for losses to fish and wildlife caused by construction and operation of the four Lower Snake River dams; Ice Harbor, Lower Monumental, Little Goose and Lower Granite Dam (LWG). The LSRCP programs expected basin wide fishery benefits for spring/summer Chinook salmon in areas below and above LWG. The commercial harvest expectation is 176,000 spring/summer Chinook, with a project area goal of 58,700 adults over Lower Granite Dam.

*McCall Fish Hatchery/South Fork Salmon River Satellite Facility*

The McCall Fish Hatchery (McCall) is located in McCall, Idaho near the North Fork Payette River which collects, holds, and spawns adult Chinook salmon at a satellite facility located 66 miles up the South Fork Salmon River. McCall was the first LSRCP facility constructed in 1979 with an adult return goal of 8,000 summer Chinook over LWG. The production target for McCall is 1 million smolts released at Knox Bridge on the South Fork Salmon River and 300,000 eggs released in Dollar Creek (IDFG et. al. 2008). This requires the collection of 1,360 adult Chinook salmon for broodstock. Adult returns are variable and are highly dependent upon migration conditions and ocean productivity.

*Sawtooth Fish Hatchery*

Sawtooth Fish Hatchery (SFH) is located 2 miles upstream of Redfish Lake Creek near the town of Stanley, Idaho. SFH was constructed in 1985 to contribute approximately 19,445 adult spring Chinook salmon to the LSRCP goal. The SFH adult return goal is based on a return of 11,310 Chinook salmon to the SFH, 6,090 to the East Fork Salmon River, and 2,045 to Valley Creek (all based on a smolt-to-adult return rate (SAR) of 0.87%). The Valley Creek component of the program was never implemented and the East Fork component was terminated in 1998. The current smolt production objective for SFH is 1.5 million smolts (IDFG et .al. 2008), which takes 350 males and 350 females for broodstock. Adult returns are variable and are highly dependent upon migration conditions and ocean productivity.

**Idaho Power Company**

The Hells Canyon Settlement Agreement (HCSA) provided offsite mitigation for lost fisheries from the construction and operation of the Hells Canyon Complex. Rapid River and Pahsimeroi Fish Hatcheries were developed under the HCSA and funded by Idaho Power Company.

*Pahsimeroi Fish Hatchery*

The mitigation goal for Pahsimeroi Fish Hatchery is to release 1 million summer Chinook salmon smolts annually into the Pahsimeroi River. Approximately 300 pair of adult summer Chinook are required to meet this mitigation when considering pre-spawning mortality and culling of disease positive adults (IDFG et .al. 2008).

*Rapid River Fish Hatchery*

Approximately, 2,500 spring Chinook salmon are needed annually for broodstock for the Rapid River Fish Hatchery spring Chinook salmon program. This number includes jacks and accounts for pre-spawning mortality at the 20-year average as well as average female culling required by disease management constraints and average fecundity. This brood level will provide 3.4 million green eggs and 3.0 million smolts at an average of 88% eye egg-to-smolt survival to meet the smolt release goal. Release sites and numbers will vary between the Little Salmon and Snake River, with the majority of production being released in Rapid River (IDFG et .al. 2008).

**Bonneville Power Administration**

The Pacific Northwest Electric Power Planning and Conservation Act of 1980 authroized Montana, Idaho, Oregon, and Washington to create the Northwest Power and Conservation Council, which created the Fish and Wildlife Program to protect, mitigate, and enhance fish and wildlife impacted by the construction of the Federal Columbia River Power System. Several supplementation programs are currently funded through the Council's Fish and Wildlife Program to increase natural production in the Salmon River sub-basin.

*Johnson Creek Artificial Propagation Enhancement*

The JCAPE program is operated on Johnson Creek, a tributary to the East Fork South Fork Salmon River in conjunction with McCall. The primary objective of the program is to supplement adult returns in Johnson Creek by collecting and propagating adults through a traditional hatchery smolt program. A maximum of 40 natural-origin adults will be collected at the Johnson Creek weir to provide broodstock for up to 100,000 smolts, annually (IDFG et .al. 2008). The progeny are reared at McCall and released as 1+ yearling smolts in Johnson Creek during April.

*Salmon River Chinook Captive Rearing Program*

IDFG and NOAA-Fisheries operate an adult Chinook salmon captive rearing supplementation program in the West Fork Yankee Fork and East Fork Salmon River. The goal of this program is to release approximately 20 pairs of adult Chinook salmon for natural spawning in each tributary.

*Yankee Fork Chinook Salmon Supplementation (YFCSS) Program*

The Tribes are developing a supplementation program in the Yankee Fork Salmon River. Adults will be collected at a weir in Yankee Fork and their progeny will be reared to smolt and released into Yankee Fork. The goal of the YFCSS program is yet to be defined, but will emphasize releasing adults and smolts to develop a locally adapted broodstock. The YFCSS will provide natural production benefits and additional harvest opportunities for Tribal members within Yankee Fork Salmon River.

*Idaho Supplementation Studies (ISS)*

The Pahsimeroi, Sawtooth, and McCall hatchery programs are scheduled to initiate supplementation starting in 2009 to increase natural production. Supplementation will provide natural production benefits and additional harvest opportunities. The *US v. Oregon* parties commit to planning in 2008 in order to implement supplementation in 2009.

## CHINOOK SALMON HARVEST MANAGEMENT

The Tribes will manage all Chinook salmon fisheries to achieve escapement or broodstock goals as the first priority using the harvest management framework discussed below. We defined 22 FMAs under this TRMP, recognizing that each population is unique and must be managed separately. The Tribes use the Lower Granite Dam prediction and counts to estimate abundance to each of the natural-origin FMAs. The harvest management frameworks are established for three groups of returning adults; natural-origin, supplementation, or hatchery-origin. If fish abundance is below 30% of VPT, NOAA-Fisheries will engage the Tribes in formal government to government consultation, consistent with all executive orders regarding consultation. The Tribes will cooperate with NOAA-Fisheries to determine resource management strategies and implement recovery plans.

The Tribes' harvest guidelines are considered maximum harvest for the Salmon River sub-basin. The Tribes will coordinate their fishery intentions with the relevant co-managers and NOAA-Fisheries, with special emphasis and discussion on areas where multiple agencies elect to open fisheries. Coordination between the Tribes, co-managers, and NOAA-Fisheries will occur throughout the fishery.

### Fishery Management Areas

According to the ICTRT (2007), there are three major population groups (MPG) of Chinook salmon within the Salmon River; South Fork Salmon River, Middle Fork Salmon River, and Upper Salmon River (Figure 6). The South Fork Salmon River contains four extant populations, the Middle Fork Salmon River contains nine extant populations, and the Upper Salmon River contains nine populations, of which eight are extant and one is extirpated (Panther Creek). The Tribes adopted twenty-two well defined harvest locations within the Salmon River sub-basin, specifically for Chinook salmon harvest management. We define the geographic area for each FMA as the area described by the ICTRT (2007) or as modified by the Tribes.

***Little Salmon River (SRLSR).*** This area includes the Little Salmon River and Rapid River and their tributaries as well as the main Salmon River and tributaries (including Whitebird and Slate creeks) downstream of the Little Salmon River to the confluence with the Snake River (Figure 7). The ICTRT population designation does not include the main Salmon River downstream from Whitebird Creek, but the Tribes include the lower main Salmon River as part of this FMA. This spring run population is classified as intermediate with a VPT of 750 adult spawners. The spawning areas include the mainstem Little Salmon River, Slate and Yellowbird creeks.

***South Fork Salmon River (SFMAI).*** This area includes the South Fork Salmon River mainstem and tributaries (except the Secesh and East Fork South Fork) extending the full length of the South Fork. The area also includes the mainstem Salmon River and tributaries between the South Fork and the Little Salmon River (Figure 7). This summer run population is classified as large with a VPT of 1,000 adult spawners. The spawning area includes the mainstem South Fork Salmon River Poverty Flats and Stolle Meadows, Warren and Crooked creeks.

***Secesh River (SFSEC).*** This area includes the entire Secesh River and its tributaries, including Lake and Lick creeks (Figure 7). This summer run population is classified as intermediate with a VPT of 750 adult spawners. The spawning areas include the mainstem Secesh River above Chinook Campground and Lake Creek.

***East Fork South Fork Salmon River (SFEFS).*** This area includes the entire East Fork South Fork Salmon River sub-basin (Figure 7). This summer run population is classified as large with a VPT of 1,000 adult spawners. The primary spawning area is located in Johnson Creek.

***Chamberlain Creek (SRCHA).*** This area includes Chamberlain Creek and its tributaries and the mainstem Salmon River and its tributaries (including Bargamin Creek) from Chamberlain Creek downstream to the South Fork Salmon River (Figure 8). This spring run population is classified as intermediate with a VPT of 750 adult spawners. The spawning areas included mainstem Chamberlain, Bargamin, McCalla, and Sabe creeks.

***Middle Fork Lower Main (MFLMA).*** This area includes the mainstem Middle Fork Salmon River and its minor tributaries from the mouth of Indian Creek to the confluence with the main Salmon River and continuing downstream to include the Salmon River and its tributaries to the confluence with Chamberlain Creek (does not include major tributaries Big, Marble, Indian, Loon, and Camas creeks which are included in separate FMAs) (Figure 8). This spring/summer run population is classified as basic with a VPT of 500 adult spawners. There are no major spawning areas identified in this FMA, but most of the documented spawning occurs in Horse Creek.

***Big Creek (MFBIG).*** This area includes the entire Big Creek Sub-basin. (Figure 8). This spring/summer run population is classified as large with a VPT of 1,000 adult spawners. There are three major spawning areas located in upper and lower Big Creek as well as Monumental Creek.

***Camas Creek (MFCAM).*** This area includes the entire Camas Creek Sub-basin (Figure 8). This spring/summer run population is classified as basic with a VPT of 500 adult spawners. The spawning areas include Camas and Yellowjacket creeks.

***Loon Creek (MFLOO).*** This area includes the entire Loon Creek Sub-basin (Figure 8). This spring/summer run population is classified as basic with a VPT of 500 adult spawners. The spawning areas are located in Loon Creek near Falconberry Meadows and Tincup campground and additional spawning occurs in East Fork Mayfield Creek.

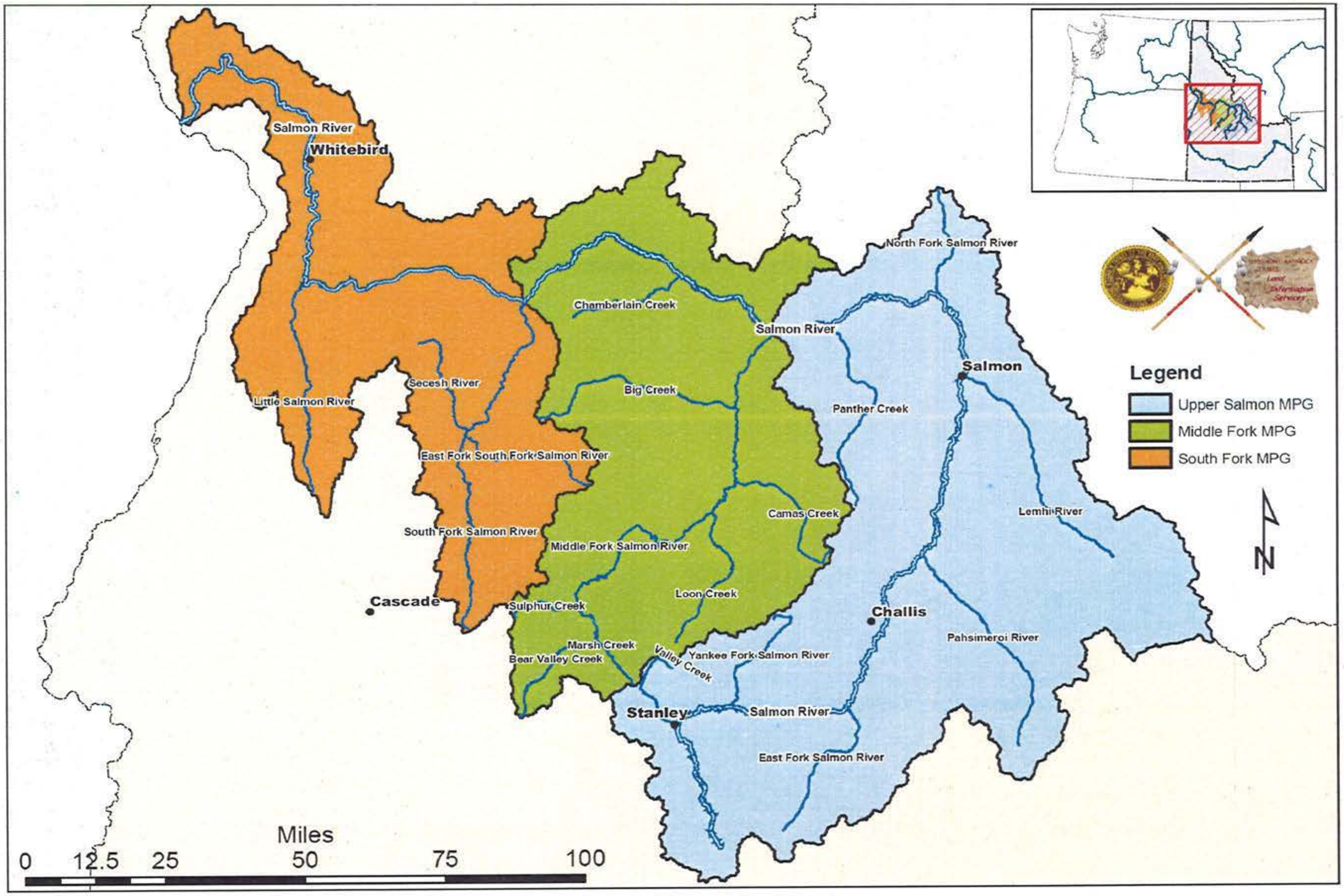


**Figure 6.** **Snake River spring/summer Chinook salmon Major Populations Groups.**

***Middle Fork Upper Main (MFUMA).*** This area includes the mainstem Middle Fork Salmon River from Indian Creek upstream to the confluence of Bear Valley and Marsh creeks, including tributaries except Sulphur Creek (does include major tributaries Marble, Indian, Pistol creeks and Rapid River and minor tributaries Soldier, Elkhorn and Dagger creeks) (Figure 8). This spring/summer run population is classified as intermediate with a VPT of 750 adult spawners. The spawning areas are scattered across the large tributaries listed above. Some spawning does occur in the mainstem Middle Fork Salmon River.

***Sulphur Creek (MFSUL).*** This area includes the entire Sulphur Creek Sub-basin (Figure 8). This spring run population is classified as basic with a VPT of 500 adult spawners. The spawning area is located in Sulphur Creek meadows located one mile above the confluence with the Middle Fork Salmon River.

***Bear Valley Creek (MFBEA).*** This area includes the entire Bear Valley Creek Sub-basin including Elk and Bear creeks, from the headwaters to the confluence with Marsh Creek (Figure 8). This spring run population is classified as intermediate with a VPT of 750 adult spawners. The spawning area includes the entire watershed from Fir Creek to the headwaters in Elk and Bear creeks.

***Marsh Creek (MFMAR).*** This area includes the entire Marsh Creek drainage, including Knapp, Beaver, Capehorn creeks, from the headwaters to the confluence with Bear Valley Creek (Figure 8). This spring run population is classified as basic with a VPT of 500 adult spawners. Spawning occurs in Marsh Creek from Capehorn Creek upstream to Knapp Creek and lower reaches of Beaver and Capehorn creeks.

***North Fork Salmon River (SRNFS).*** This area includes the entire North Fork Salmon River system, the mainstem Salmon River and its tributaries from the North Fork downstream to the confluence with Panther Creek (Figure 9). This spring/summer run population is classified as basic with a VPT of 500 adult spawners. The majority of spawning in the North Fork Salmon River occurs in the mainstem.

***Lemhi River (SRLEM).*** This area includes the entire Lemhi River drainage and the mainstem Salmon River from the Lemhi River downstream to the confluence with the North Fork Salmon River (Figure 9). This spring run population is classified by the Tribes as large with a VPT of 1000 adult spawners. The spawning areas include the main Lemhi River near Hayden Creek and in Eightmile, Texas, and Carmen creeks.

***Salmon River Lower Mainstem (SRLMA).*** The area as defined by the Tribes includes the mainstem Salmon River and its tributaries from Valley Creek downstream to the Lemhi River (expect for the Pahsimeroi, East Fork, and Yankee Fork Salmon Rivers) (Figure 9). The Tribes classify this spring/summer run population as large with a VPT of 2000 adult spawners. The spawning areas include the mainstem Salmon River with tributary spawning.

***Pahsimeroi River (SRPAH).*** This area includes the entire Pahsimeroi River sub-basin (Figure 9). This summer run population is classified as large with a VPT of 500 adult spawners. The spawning areas include the mainstem Pahsimeroi River, Patterson, and Goldberg creeks.

***East Fork Salmon River (SREFS).*** This area includes the entire East Fork Salmon RiversSub-basin (Figure 9). This spring/summer run population is classified as large with a VPT of 1000 adult spawners. The spawning areas occur in the mainstem East Fork from Big Boulder Creek to the headwaters and in tributaries Herd, Germania, and East Pass creeks.

***Yankee Fork Salmon River (SRYFS).*** This area includes the entire Yankee Fork Salmon River sub-basin (Figure 9). The spring/summer run population is classified as basic with a VPT of 500 adult spawners. The spawning areas are distributed broadly throughout the mainstem of Yankee Fork with tributary spawning in West Fork, Eightmile and Jordan creeks.

***Valley Creek (SRVAL).*** This area includes the entire Valley Creek sub-basin (Figure 9). This spring/summer run population is classified as basic with a VPT of 500 adult spawners. The spawning areas are distributed broadly throughout Valley Creek with tributary spawning in Elk Creek.

***Salmon River Upper Mainstem (SRUMA).*** The area as defined by the Tribes includes the mainstem Salmon River and its tributaries from Valley Creek upstream to the headwaters (Figure 9). This spring/summer run population is classified as large with a VPT of 1000 adult spawners. The spawning areas include the main Salmon River above Valley Creek to the headwaters, Alturas Lake, Pole, Beaver and Frenchman creeks.

***Panther Creek (SRPAN).*** This area includes the entire Panther Creek sub-basin and the mainstem Salmon River and tributaries from Panther Creek downstream to the Middle Fork Salmon River (including Colson and Owl creeks) (Figure 9). The Tribes classify this population as a spring/summer run and basic with a VPT of 500 adult spawners. The major spawning areas include Panther Creek pstream of Deep Creek and tributary spawning in Woodtick, Musgrove, Porphyry and Moyer creeks.

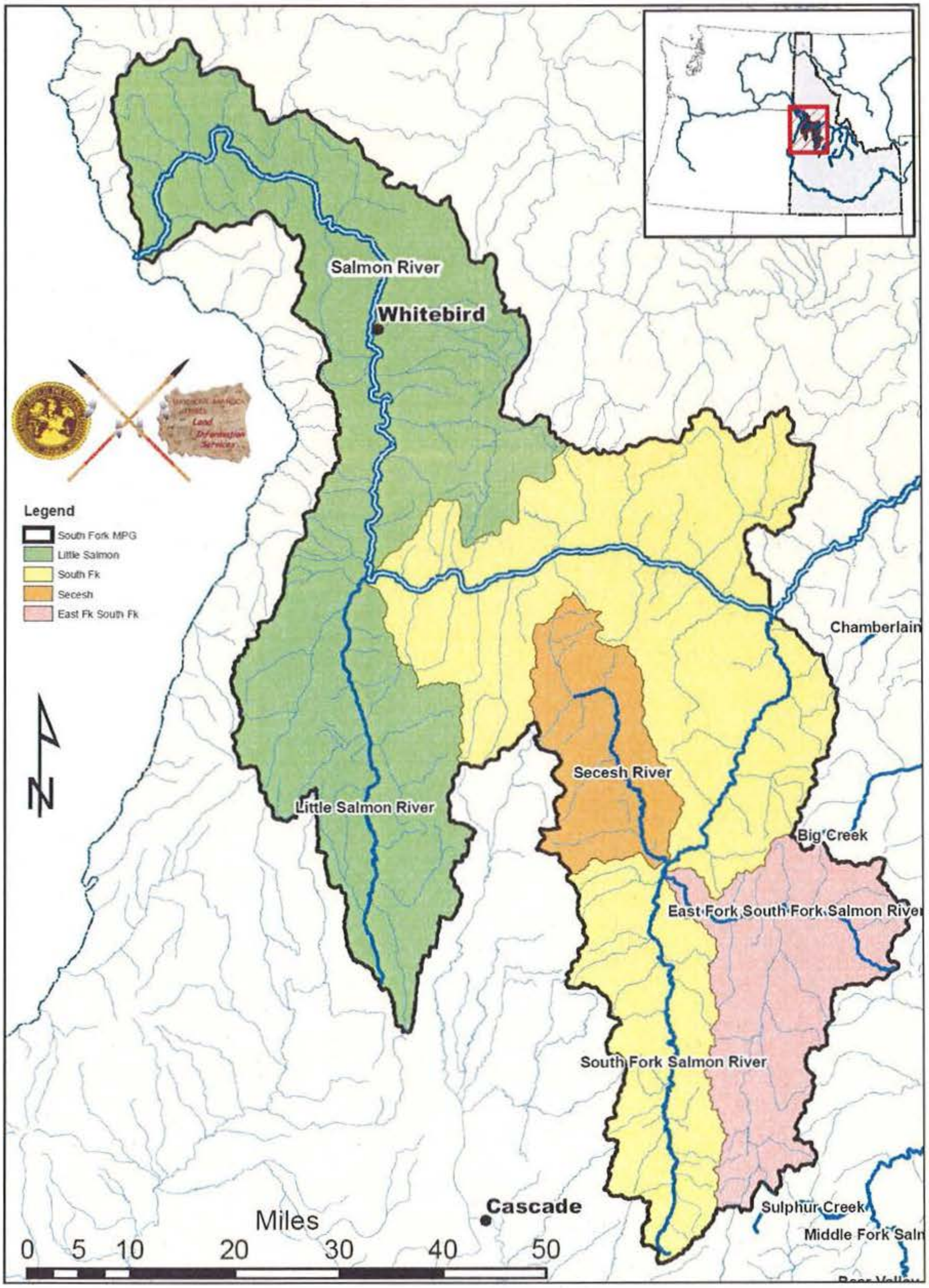


**Figure 7.** **South Fork Salmon River MPG and four respective Chinook salmon populations; Little Salmon, South Fork, Secesh, and East Fork South Fork.**

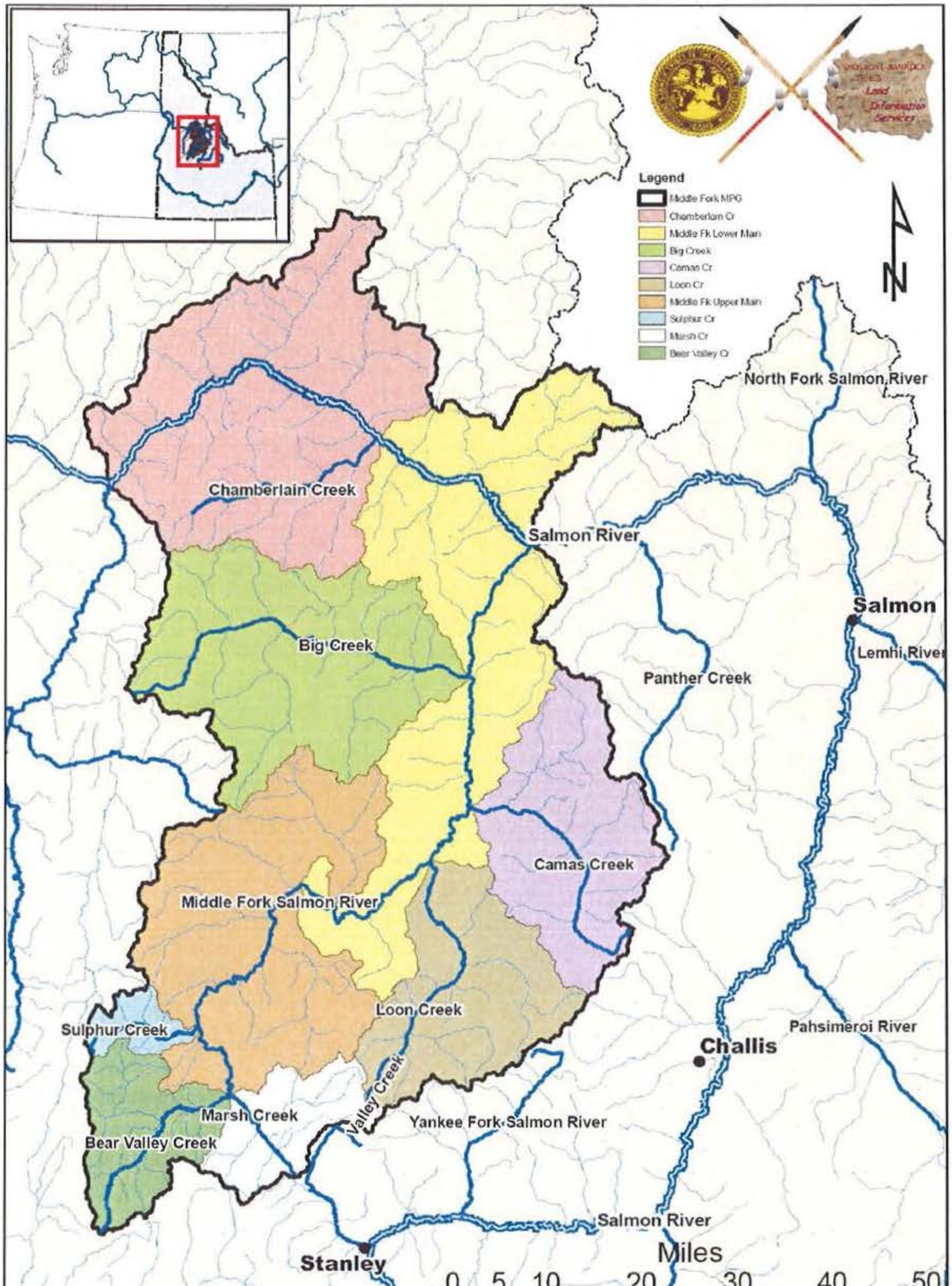


**Figure 8.** **Middle Fork Salmon River MPG and nine respective Chinook salmon populations; Chamberlain, Middle Fork Lower Main, Big, Camas, Loon, Middle Fork Upper Main, Sulphur, Marsh, and Bear Valley.**

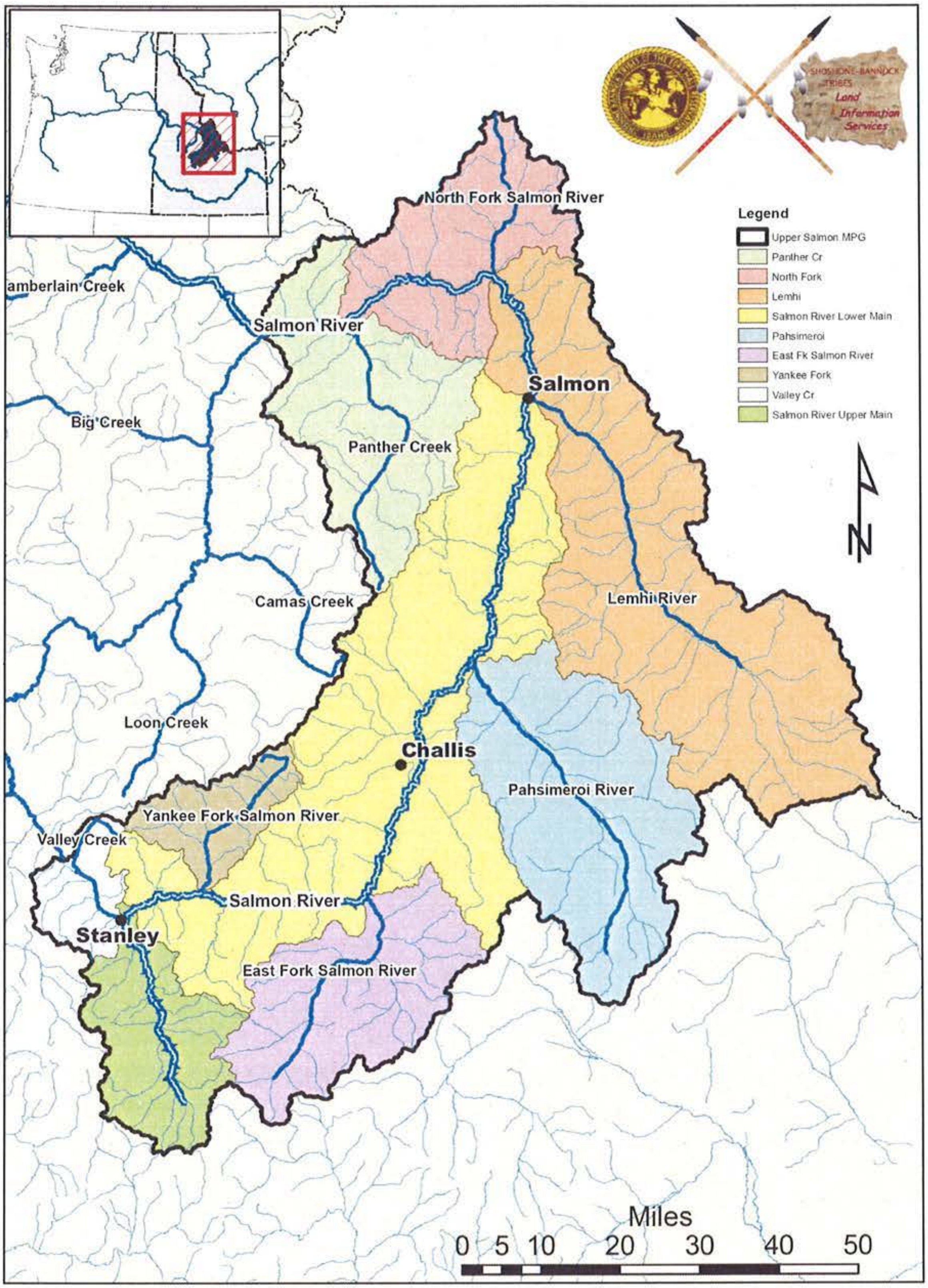


Figure 9. Upper Salmon River MPG and nine respective Chinook salmon populations; Panther, North Fork, Salmon River Lower Main, Lemhi, East Fork, Yankee Fork, Valley, and Salmon River Upper Main.

## Escapement Goals

The Tribes utilized the VPT identified by the ICTRT as escapement goals for twenty-two natural-origin Chinook salmon populations (Table 3). We further used the VPT to develop abundance-based sliding-scale harvest management frameworks for basic, intermediate, and large populations. The Tribes adopted a critical level at 30% of VPT recognizing the extreme risks associated with extinction. The Lemhi population is classified by the ICTRT as a very large population; similarly the ICTRT classifies Panther Creek as an Intermediate population. The Tribes reclassified these populations because they do not function at a level relative to their ICTRT recommendation. If supporting information becomes available that demonstrates these populations are behaving according to ICTRT recommendations (if habitat/carrying capacity can sustain abundance, productivity, spatial distribution, and genetic diversity), the Tribes will reconsider switching to using the TRT threshold in consultation with NOAA-Fisheries.

**Table 2. List of the FMAs, name, critical level, viable population thresholds, and associated hatchery stocks included in this TRMP.**

| FMA code | Name | Critical Level | Viable Population Threshold | Associated hatchery stock(s) |
|---|---|---|---|---|
| SRLSR | Little Salmon River | 225 | 750 | Rapid River Fish Hatchery |
| SFMAI | South Fork Salmon River | 300 | 1,000 | McCall Fish Hatchery |
| SFSEC | Secesh River | 225 | 750 | |
| SFEFS | East Fork South Fork Salmon River | 300 | 1,000 | JCAPE |
| SRCHA | Chamberlain Creek | 225 | 750 | |
| MFLMA | Middle Fork Lower Main | 150 | 500 | |
| MFBIG | Big Creek | 300 | 1,000 | |
| MFCAM | Camas Creek | 150 | 500 | |
| MFLOO | Loon Creek | 150 | 500 | |
| MFUMA | Middle Fork Upper Main | 225 | 750 | |
| MFSUL | Sulphur Creek | 150 | 500 | |
| MFBEA | Bear Valley Creek | 225 | 750 | |
| MFMAR | Marsh Creek | 150 | 500 | |
| SRPAN | Panther Creek [1] | 150 | 500 | |
| SRNFS | North Fork Salmon River | 150 | 500 | |
| SRLEM | Lemhi River [2] | 300 | 1,000 | |
| SRLMA | Salmon River Lower Main | 300 | 2,000 | |
| SRPAH | Pahsimeroi River[1] | 300 | 500 | Pahsimeroi Fish Hatchery |
| SREFS | East Fork Salmon River | 300 | 1,000 | Captive Rearing |
| SRYFS | Yankee Fork Salmon River | 150 | 500 | Captive Rearing, YFCSS |
| SRVAL | Valley Creek | 150 | 500 | |
| SRUMA | Salmon River Upper Main | 300 | 1,000 | Sawtooth Fish Hatchery |

1/ The Tribes define this FMA as basic populations.
2/ The Tribes define these FMAs as large populations.

The Tribes summarized the population assessments developed by the ICTRT (2007) to describe the current status of each population (Table 4). Low escapement estimates result in all of the populations being classified at high risk for both abundance and productivity. Thirty-two percent of the populations are at low risk for spatial structure and genetic diversity, 36% at moderate risk, and 32% at high risk.

**Table 3. List of fishery management areas and associated VSP risk levels from the ICTRT (2007).**

| FMA | Name | Abundance/ Productivity Risk | | | | Spatial Structure/ Diversity Risk | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Very Low* | *Low* | *Mod* | *High* | *Very Low* | *Low* | *Mod* | *High* |
| SRLSR | Little Salmon River[1] | | | | X | | | | X |
| SFMAI | South Fork Salmon River | | | | X | | | X | |
| SFSEC | Secesh River | | | | X | | X | | |
| SFEFS | East Fork South Fork | | | | X | | X | | |
| SRCHA | Chamberlain Creek | | | | X | | X | | |
| MFLMA | Middle Fork lower main | | | | X | | | X | |
| MFBIG | Big Creek | | | | X | | | X | |
| MFCAM | Camas Creek | | | | X | | | X | |
| MFLOO | Loon Creek | | | | X | | | X | |
| MFUMA | Middle Fork upper main[1] | | | | X | | | | X |
| MFSUL | Sulphur Creek | | | | X | | | X | |
| MFBEA | Bear Valley Creek | | | | X | | X | | |
| MFMAR | Marsh Creek | | | | X | | X | | |
| SRPAN | Panther Creek[1] | | | | X | | | | X |
| SRNFS | North Fork Salmon River | | | | X | | X | | |
| SRLEM | Lemhi River | | | | X | | | | X |
| SRLMA | Salmon River lower main | | | | X | | X | | |
| SRPAH | Pahsimeroi River | | | | X | | | | X |
| SREFS | East Fork Salmon River | | | | X | | | | X |
| SRYFS | Yankee Fork Salmon River | | | | X | | | | X |
| SRVAL | Valley Creek | | | | X | | | X | |
| SRUMA | Salmon River upper main | | | | X | | | X | |

[1] Risk levels classified by Shoshone-Bannock Tribes.

## Forecasting

TAC will develop pre-season upriver spring Chinook forecasts for the Columbia River mouth. This forecast will be used by the *US v. Oregon* parties to develop harvest guidelines for Snake and Upper Columbia River Chinook salmon. The Columbia River forecast is validated with Bonneville Dam counts and harvest estimates in Zones 1-5. If the forecast is not correct after 50% of the run has passed Bonneville Dam, (usually if harvest and/or dam counts are low) TAC will review the current data and update the forecast.

Once the upriver spring Chinook forecast is developed, TAC will forecast escapement to Lower Granite Dam. Zone 6 harvest rates are determined by the upriver spring Chinook salmon forecast. The Lower Granite Dam forecast assumes harvest will occur in the Zone 6 fishery and inter-dam mortality is representative of historical estimates.

The Lower Granite Dam forecast is then used to forecast escapement into the Snake River Basin as defined by five major rivers; Salmon, Clearwater, Grande Ronde, Imnaha, and Snake rivers. This forecast consists of the escapement estimate for hatchery and natural-origin adult Chinook salmon. The natural-origin escapement estimate is derived by dividing the percent of production from each river. The percent of production is determined by the sum of the total redds recorded above Lower Granite Dam divided by the number of redds located in each system from the two adult brood years (2-3 ocean adults). Once escapement estimates are developed for each major river, we can further refine the forecast for each population using the same methodology.

The Tribes long-term goal is to develop accurate and precise methods to estimate escapement and will research other methods to forecast escapement at the population level. The use of long-term data series of redds counts can be regressed against Lower Granite Dam counts of unclipped Chinook salmon. Forecasts of hatchery fish will be accomplished primarily through use of PIT tags. Groups of up to 50,000 hatchery smolts are released at Rapid River, Sawtooth, Pahsimeroi, and South Fork, which will allow managers the ability to predict escapement and run-timing.

**Annual Implementation of the Fisheries**

The Tribes will use standard methodology agreed upon by the co-managers to develop population-specific pre-season forecasts. The methodology to develop pre-season forecasts can be modified at any time in a coordinated fashion, provided that all parties use the same methodology from that point forward. The Tribes will use the population-specific preseason forecast and either the natural-origin harvest rate schedule (Table 5), the supplemented population harvest rate schedule (Table 7), or the hatchery-origin harvest rate schedule (Table 8) - as appropriate - to determine the year-specific allowable ESA take limit by population. The Tribes will develop and share with co-managers and NOAA Fisheries a yearly FIP prior to promulgation of yearly fishery regulations.

The Tribes will work in-season with other co-managers to update pre-season forecast as needed and will use the same updated inseason updates as other co-managers and will adjust the FIP accordingly. The Tribes will report weekly harvest impacts by population to co-managers and NOAA-Fisheries.

Fisheries' curtailment procedures have been established by the Tribes' Fish and Wildlife Department and Fort Hall Business Council and will be described in the FIP and fisheries regulations. Fisheries curtailment will be triggered when the total population-specific ESA limit is reached on any given year or by any other provision described in the FIP. The Fish and Wildlife Department will post curtailments at the tributaries, mailed letters to fisherman, and through weekly Tribal fishing updates as needed. The Tribes will use the Snake Basin Harvest Forum, along with co-managers to share harvest information, take of ESA-listed fish information, adult trapping information, spawning ground survey data and to develop post-season escapement estimates. The post-season escapement estimates and information about the take of ESA-listed fish will be used by the Tribes, along with other co-managers, to determine post-season total ESA impacts by population and reported in the Chinook Salmon Harvest Management Program annual report submitted to NOAA-Fisheries and other co-managers.

**Natural-origin Framework**

The Tribes will manage all Chinook salmon fisheries to achieve escapement objectives. As the number of predicted adults increase towards the VPT, the number of fish escaping to the spawning grounds will also increase. The overall percent of the total run escaping will be lower in high escapement years, with the actual escapement value being higher. This will allow harvest opportunities to increase accordingly. The natural-origin management framework is used to determine the total allowable harvest for any given population or hatchery program. If other co-managers propose fisheries above and beyond our harvest rates, we will coordinate our best effort to negotiate equitable harvest allocation.

Harvest will be no lower than 1% and no higher than 35% in any given year. As population abundance increases to 30.1 – 50% of the VPT, the Tribes escapement objective is 97% and the harvest rate is 3%. As population abundance increase to 50.1 – 75% of the VPT, the Tribes escapement objective is 95% and the harvest rate is 5%. As populations increase to 75.1 – 108% of the VPT, the Tribes escapement objective is 92% and the harvest rate is 8%. When abundance exceeds 108.1% of the VPT, the Tribes escapement objective will range from 65% – 92% and the harvest rate will range from 8% – 35% (Table 5).

The Tribes will utilize the harvest management frameworks located below to develop annual harvest guidelines. We developed harvest management frameworks for basic, intermediate, large and very large Chinook salmon populations (Table 6). Basic populations include the Middle Fork Lower Main, Camas, Loon, Marsh, Sulphur, Panther, North Fork, Pahsimeroi, Yankee Fork, and Valley Creek. Intermediate populations include the Little Salmon, Secesh, Chamberlain, Middle Fork Upper Main, and Bear Valley. Large populations include South Fork, East Fork South Fork, Big, Lemhi, East Fork, and Salmon River Upper Main. The only very large population is Salmon River Lower Main.

Table 4. **Percent escapement objective and harvest rate for natural-origin populations of Snake River spring/summer Chinook salmon.**

| Percent of Viable Population Threshold | Percent Escapement Objective | Harvest Rate |
|---|---|---|
| 0 – 30% | 99% | 3 fish |
| 30.1 – 50% | 97% | 3% |
| 50.1 – 75% | 95% | 5% |
| 75.1 – 108% | 92% | 8% |
| > 108.1% | 65 – 92% | 35% of the margin |

Table 5. **Abundance-based sliding-scale harvest management framework for natural-origin populations of Snake River spring/summer Chinook salmon.**

| Population Category | Viable Population Threshold | Percent of VPT | Forecast | Harvest Rate | Harvest |
|---|---|---|---|---|---|
| Basic [1] | 500 | 0 - 30% | <150 | | 3 |
| | | 30.1% - 50% | 151 - 250 | 3% | 5 - 8 |
| | | 50.1% - 75% | 251 - 375 | 5% | 13 - 19 |
| | | 75.1% -108% | 376 - 540 | 8% | 30 - 43 |
| | | ≥ 108.1% | ≥ 541 | 35% [5] | ≥ 44 |
| Intermediate [2] | 750 | 0 - 30% | <225 | | 3 |
| | | 30.1% - 50% | 226 - 375 | 3% | 7 - 11 |
| | | 50.1% - 75% | 376 - 563 | 5% | 19 - 28 |
| | | 75.1% -108% | 564 - 810 | 8% | 45 - 65 |
| | | ≥ 108.1% | ≥ 811 | 35% [5] | ≥ 66 |
| Large [3] | 1000 | 0 - 30% | < 300 | | 3 |
| | | 30.1% - 50% | 301 - 500 | 3% | 9 - 15 |
| | | 50.1% - 75% | 501 - 750 | 5% | 25 - 38 |
| | | 75.1% -108% | 751 - 1080 | 8% | 60 - 86 |
| | | ≥ 108.1% | ≥ 1081 | 35% [5] | ≥ 87 |
| Very Large[4] | 2000 | 0 – 30% | < 600 | | 3 |
| | | 30.1% - 50% | 601 - 1000 | 3% | 18 - 30 |
| | | 50.1% - 75% | 1001 - 1500 | 5% | 50 - 75 |
| | | 75.1% - 108% | 1501 - 2160 | 8% | 120 - 173 |
| | | ≥ 108.1% | ≥ 2161 | 35%[5] | ≥ 174 |
| 1/ | Basic areas include Middle Fork Lower Main, Camas, Loon, Marsh, Sulphur, Panther, North Fork, Pahsimeroi, Yankee Fork, Valley | | | | |
| 2/ | Intermediate areas include Little Salmon, Secesh, Chamberlain, Middle Fork Upper Main, Bear Valley | | | | |
| 3/ | Large areas include South Fork, East Fork South Fork, Big, Lemhi, East Fork, Salmon River Upper Main | | | | |
| 4/ | Very Large areas include Salmon River Lower Main | | | | |
| 5/ | The 35% harvest rate applies only to portion of return greater than 108% of viability abundance objective. If R = return and E = viability population threshold, then catch = 0.08(1.08 E) + (0.35(R-1.08 E)). | | | | |

## Supplementation Framework

The Tribes will adjust the natural-origin harvest framework in FMAs that contain natural-origin adults and an active supplementation program (Table 7). The supplemented population framework will be used under the following circumstances: (1) there has been a juvenile or adult release program designed to supplement natural production; (2) returns from the supplementation program include 4 and 5 year-old fish; and (3) co-managers have the ability to forecast the returning number of fish from the supplementation program. The supplementation management framework is used to determine the total allowable harvest for any given population or hatchery program. If other co-managers propose fisheries above and beyond our harvest rates, we will coordinate our best effort to negotiate equitable harvest allocation.

**Table 6. Modified abundance-based sliding-scale harvest management framework for supplemented populations of Snake River spring/summer Chinook salmon.**

| Percent of Viable Population Threshold | Percent Escapement Objective | Harvest Rate |
|---|---|---|
| 0 – 30% | 99% | 1% |
| 30.1 – 50% | 96% | 4% |
| 50.1 – 75% | 91% | 9% |
| 75.1 – 108% | 88% | 12% |
| > 108.1% | 65 – 92% | 42% of the margin |

## Hatchery-origin Framework

The majority of the Tribes' harvest is anticipated to come from hatchery-origin stocks, as these populations are generally in higher abundance than natural-origin populations. The Tribes' harvest management framework is designed to achieve hatchery broodstock goals and uses an 8% table with modifications. The harvest management framework is used to determine the total allowable harvest for any given population or hatchery program. If other co-managers propose fisheries above and beyond our harvest rates, we will coordinate our best effort to negotiate equitable harvest allocation.

The Tribes recognize hatchery broodstock goals are necessary to keep programs operating. We will continue to utilize the existing harvest management framework consistent with current management strategies. Harvest will be no lower than 1% and no higher than 50% in any given year. If forecasts are less than 29.9% of the broodstock goal, the Tribes will implement a fishery for 3 fish. As hatchery returns increase to 30 – 49.9% of the broodstock goal, the Tribes harvest rate is 3%. As hatchery returns increase to 50 – 74.9% of the broodstock goal, the Tribes harvest rate is 5%. As hatchery returns increase to 75 – 107.9% of the broodstock goal, the Tribes harvest rate is 8%. When abundance exceeds 108% of the broodstock goal, the Tribes will harvest 8% of the run of to 108% of the broodstock goal and an additional 35% of the run above

108% - 139.9% of the broodstock goal. When hatchery returns are above 140% of the broodstock goal, the Tribes will harvest 50% of the available surplus (Table 8).

Hatchery-origin adult Chinook salmon can be intercepted in natural-origin FMAs located downstream from hatchery facilities. Understanding that hatchery fish will migrate through multiple FMAs, the Tribes will partition harvest accordingly, depending upon location of take. Additional details on proportioning harvest are discussed under harvest monitoring.

**Table 7. Harvest management framework for hatchery programs in Salmon River basin.**

| Hatchery Program | Broodstock Goal [1] | % of Goal | Forecast | Harvest Rate | Harvest |
|---|---|---|---|---|---|
| Rapid River | 2500 | 0 - 29.9% | < 748 | | 3 |
| | | 30% - 49.9% | 749 - 1248 | 3% | 22 - 37 |
| | | 50% - 74.9% | 1249 - 1873 | 5% | 62 - 94 |
| | | 75% -107.9% | 1874 - 2698 | 8% | 150 - 216 |
| | | 108% - 139.9% | 2699 - 3498 | 35% [2] | 217 - 496 |
| | | ≥ 140% | ≥ 3499 | 50% [3] | ≥ 497 |
| South Fork/ McCall | 1360 | 0 - 29.9% | < 407 | | 3 |
| | | 30% - 49.9% | 408 - 679 | 3% | 12 - 20 |
| | | 50% - 74.9% | 680 - 1019 | 5% | 34 - 51 |
| | | 75% -107.9% | 1020 - 1467 | 8% | 82 - 117 |
| | | 108% - 139.9% | 1468 - 1903 | 35% [2] | 118 - 270 |
| | | ≥ 140% | ≥ 1904 | 50% [3] | ≥ 271 |
| Pahsimeroi | 600 | 0 - 29.9% | < 179 | | 3 |
| | | 30% - 49.9% | 180 - 299 | 3% | 5 - 9 |
| | | 50% - 74.9% | 300 - 449 | 5% | 15 - 22 |
| | | 75% -107.9% | 450 - 647 | 8% | 36 - 52 |
| | | 108% - 139.9% | 648 - 839 | 35% [2] | 53 - 119 |
| | | ≥ 140% | ≥ 840 | 50% [3] | ≥ 120 |
| Sawtooth | 700 | 0 - 29.9% | < 209 | | 3 |
| | | 30% - 49.9% | 210 - 349 | 3% | 6 - 10 |
| | | 50% - 74.9% | 350 - 524 | 5% | 18 - 26 |
| | | 75% -107.9% | 525 - 755 | 8% | 42 - 60 |
| | | 108% - 139.9% | 756 - 979 | 35% [2] | 61 - 139 |
| | | ≥ 140% | ≥ 980 | 50% [3] | ≥ 140 |
| 1/ | Broodstock goals were developed by the Salmon River co-managers and incorporated in the 2008 Salmon River Annual Operating Plan. | | | | |
| 2/ | The 35% harvest rate applies only to portion of return greater than 108% of viability abundance objective. If R = return and E = viability abundance objective, then catch = 0.08(1.08 E) + (0.35(R-1.08 E)). | | | | |
| 3/ | When abundance reaches ≥ 140% of the broodstock goal, the Tribes elect to harvest 50% of the available surplus. Available surplus is defined by the number of adults not necessary to meet broodstock goals. | | | | |

## Regulations and Guidelines

Once the run predictions are established, the Tribes apply the abundance estimate to the abundance-based sliding-scale harvest management framework. As run updates occur, the Tribes re-apply the updated abundance estimate to the framework and update the corresponding harvest guideline. The Fish and Game Commission establishes annual salmon hunting regulations and harvest guidelines. Harvest regulations and guidelines are set and mailed to Tribal fisherman, NOAA-Fisheries, and co-managers. As dam counts progress and adult abundance predictions are updated, harvest guidelines may be modified and re-distributed.

Tribal fisherman will be allowed to fish for Chinook salmon with a spear, net, hook and line, or other traditional and contemporary methods. Fishing occurs throughout the day and night wherever there is opportunity to harvest fish. The Tribes reserve the opportunity to implement fishing selectively for hatchery-origin fish with the release of natural-origin fish.

Interception harvest will occur on returning adult salmon migrating through mainstem river reaches in the Salmon, South Fork and Middle Fork. In-season harvest of fish in mixed stock FMAs will be proportioned according to the expected escapement in preliminary reports. Our final harvest estimates in mixed stock FMAs will be based on actual escapement, post fishery.

Harvest in each FMA will be curtailed when either the natural-origin or hatchery-origin guideline is reached, or spawning commences in > 25% of the FMAs, whichever comes first. If there are surplus hatchery-origin fish, we will request that they are used for recovery and conservation purposes, or distributed to the Tribes or food banks, appropriately.

## Enforcement

Specific enforcement authorities are contained in the Tribes' Constitution and Bylaws; 1975 Game Code; and annual salmon hunting regulations and guidelines enacted by the Tribes' Fish and Game Commission. The Tribes' Fish and Game Department provides enforcement, protection and education of the annual salmon hunting regulations and guidelines. When the Tribes enact the annual salmon hunting regulations and guidelines, a copy is provided to IDFG and NOAA-Fisheries. Tribal enforcement personnel may meet with State and other federal law enforcement officers in order to exchange information and coordinate enforcement activities where multiple agencies are conducting fisheries.

Violations of the 1975 Game Code and annual salmon hunting regulations and guidelines are prosecuted in Tribal Court. Incident reports made by State and Federal enforcement personnel are communicated to the Tribes enforcement personnel for

Tribal investigation. Monitors and enforcement personnel are given the authority and responsibility to conduct creel surveys and curtail fisheries once harvest guidelines are reached or spawning begins.

**Public Outreach**

Information is sent to Tribal fishermen and Sho-Ban News regarding preliminary assessments of run strength, recent issues, and future meetings. Summaries of "Joint Staff Report Concerning Commercial Seasons for Spring Chinook, Steelhead, Sturgeon, Shad, Smelt, and other Species and Miscellaneous Regulations" are mailed to the Tribal Fishermen prior to the January Columbia River Compact Hearing. Joint State reports pertaining to Columbia River sport fisheries are also provided to the Tribal Fishermen at this time. Tribal fishermen and staff attend the January Columbia River Compact Hearing to provide testimony concerning Columbia River mainstem fisheries and harvest allocation pertaining to Snake River spring/summer Chinook salmon.

Tribal fishermen meetings are held to discuss the forecasts, run-timing, and proposed regulations and guidelines. Tribal concerns are considered in the final salmon hunting regulations and guidelines. Updates are provided to fishermen on run strength, trap counts, flows, harvest, modifications to guidelines, curtailments, and additional information.

## MONITORING AND EVALUATION

The Tribes developed two performance indicators used to determine harvest, abundance, productivity, spatial structure, and genetic diversity. The performance indicators are adult and juvenile abundance. Adult abundance will be measured by mainstem harvest, dam counts, Tribal harvest monitoring, fish counting stations and spawning ground surveys. Juvenile abundance will be measured by rotary screw traps and survival will be monitored at Lower Granite Dam.

**Adult Abundance**

Accurate estimates of escapement are essential for effective management and conservation of salmonids (Busby et al. 1996; McElhany et al. 2000). For this TRMP, we will utilize five performance indicators to estimate Chinook salmon adult abundance; mainstem harvest, dam counts, weir counts, redd counts, and harvest.

*Mainstem Harvest*

The Tribes will utilize mainstem harvest estimates provided by TAC to determine total abundance of Snake River spring/summer Chinook salmon. Mainstem Columbia River harvest monitoring does not provide accounting of impacts at the population level. Impacts are reported at the ESU level, which is not conducive to effect management and recovery of listed species. The Tribes will continue to advocate for increased monitoring and evaluation to validate the current assumption that harvest impacts are spread evenly across the Snake River spring/summer Chinook salmon populations.

Genetic Stock Identification (GSI) methods have proven to be effective in determining the proportion of stock origin in several mixed stock fisheries (Shaklee et al. 1999, Beacham et al. 2006). Population genetic methods and statistical assignment models taking advantage of the power of microsatellite techniques which have advanced dramatically in recent years, and estimates of stock composition is now possible using Bayesian or Maximum Likelihood methods (Kalinowski 2003). This methodology could be used to evaluate mainstem fishery impacts at the population level and provide greater accountability.

*Dam Counts*

The two primary adult Chinook salmon counts used in this TRMP are collected at Bonneville and Lower Granite dams. Bonneville Dam is located 146 miles from the mouth of the Columbia River and Lower Granite Dam, the last of eight dams is located 432 miles from the mouth. The Tribes use dam counts for pre-season, in-season, and post-season fisheries management. This data is important for tracking adult counts throughout the season to determine if forecasts are accurate.

There are three primary runs of Chinook salmon migrating into the Columbia River above Bonneville Dam; they include upriver spring Chinook, summer Chinook, and fall Chinook. Upriver spring Chinook, which includes Snake River spring/summer Chinook and Upper Columbia Spring Chinook are counted from March 15 – May 31. Summer Chinook are counted from June 1 – July 31 and fall Chinook from August 1 – November 15. There are also three runs of Chinook salmon migrating above Lower Granite Dam; they include spring, summer, and fall Chinook. Spring Chinook are counted from March 17 – June 17, summer Chinook are counted from June 18 – August 17, and fall Chinook are counted from August 18 – December 15.

Jack salmon counts are primarily used to forecast four year old salmon returns in the following year. Jack salmon counts are used to determine overall catch composition. Jack salmon do not count towards the harvest guidelines, but will be noted in the overall catch estimate. If Tribal members report harvest and include jack salmon as total catch, the actual harvest estimate will be highly biased, in terms of adult salmon.

All of the Columbia River dams are capable of detecting Passive Integrated Transponder (PIT) tags. PIT tags are typically injected into a proportional amount of migrating salmon and give researchers insight into survival and migration timing. We will utilize PIT tag interrogations at Bonneville and Lower Granite dam to refine our forecasts and develop run-timing (i.e. early, average, or late) predictions. Run-timing information is useful in updating forecasts, which typically occurs when approximately 50% of the run has passed a dam.

At Lower Granite Dam, the data is collected on the composition of clipped (hatchery) and un-clipped (natural) Chinook salmon. This information is available upon request and will be used to validate the Lower Granite Dam forecast, which includes the number of hatchery and natural Chinook salmon.

The U.S. Army Corps of Engineers (USCOE) provides daily and annual estimates for all migrating species that cross their dams. PIT tag data and composition data is also collected and available at the following websites. We will use this information to adaptively manage the Chinook salmon harvest management program.

www.cbr.washington.edu/dart/
www.fpc.org/

*Harvest Monitoring*

The Fish and Wildlife Department will develop a Harvest Monitoring Program to provide accurate and precise estimates of Chinook salmon harvest in all FMAs open to salmon fishing. Each year, the biologists will develop a harvest monitoring and evaluation plan developed with the best available science, current harvest guidelines, and anticipated funding. This will allow the Department to maximize monitoring effort throughout the Salmon River sub-basin.

The Tribes began harvest monitoring in 1981 and documented the majority of harvest in the following FMAs: South Fork; Salmon River Upper Main; Yankee Fork, Bear Valley Creek; East Fork; and Marsh Creek. Minimal harvest has occurred in Secesh, East Fork South Fork, Big, Camas, Loon, Pahsimeroi, Valley and Lemhi. As we initiate this TRMP, harvest monitoring will be focused in the areas listed above, with development of creel surveys in the Little Salmon River, Chamberlain Creek, Middle Fork Upper Main, Middle Fork Lower Main, Sulphur Creek, Panther Creek, North Fork, and Salmon River Lower Main.

The primary objective of harvest monitoring is to ascertain catch per unit effort (CPUE), with effort recorded as catch/fishermen/day. Harvest monitors and enforcement personnel frequently patrol high effort fishing areas and record date, time, catch, location, name of fisherman, hours fished, species, external and internal marks, length, gender, and other miscellaneous information. This information is used to generate harvest estimate by FMA and reported to NOAA-Fisheries and relevant co-managers. Fishery monitors also collect tissue and scale samples from willing fisherman for population genetics and age structure.

Fishermen are typically concentrated in areas accessible to vehicles with camping in close proximity. We receive few reports of fishermen accessing FMAs via drift boats, rafts, or other water crafts. Creel surveys include an initial count of the total efforts with key information recorded including vehicles and camp locations. Coordination between monitors and enforcement personnel occurs frequently to share information. Biologists will develop a harvest summary regarding available fish for harvest in each FMA. Biologists will also use CPUE to determine when harvest guidelines will be achieved. This information is shared with fishermen and staff to increase knowledge of fish abundance and implement curtailments. Enforcement personnel will continue to patrol the curtailments as necessary.

To accurately report harvest impacts by population, the Tribes will develop a protocol to proportion harvest accordingly in FMAs where multiple populations are likely to be harvested (Table 9). The populations at the head-end of the MPGs are subjected to interception harvest in fisheries downstream. For example, fish from the Salmon River Upper Main population can be harvested in any of the lower FMAs that contain mainstem river reaches. The Tribes mainstem Salmon River, Middle Fork, and lower South Fork (below the confluence with the East Fork South Fork) harvest is minimal at best, until the river approaches levels conducive to tribal gear and techniques. Mainstem harvest will be proportioned to downstream FMA's based the expected escapement.

**Table 8. List of populations intercepted in downstream Salmon River fisheries.**

| Fishery Management Area | Number of Populations This FMA Intercepts | Number of FMAs this Population is Intercepted In |
|---|---|---|
| Little Salmon River | 22 | 0 |
| South Fork Salmon River | 21 | 1 |
| Secesh River | 0 | 2 |
| East Fork South Fork | 0 | 2 |
| Chamberlain Creek | 18 | 2 |
| Middle Fork Lower Main | 17 | 3 |
| Big Creek | 0 | 4 |
| Camas Creek | 0 | 4 |
| Loon Creek | 0 | 4 |
| Middle Fork Upper Main | 3 | 4 |
| Sulphur Creek | 0 | 5 |
| Bear Valley Creek | 0 | 5 |
| Marsh Creek | 0 | 5 |
| Panther Creek | 8 | 4 |
| North Fork Salmon River | 7 | 5 |
| Lemhi River | 6 | 6 |
| Salmon River Lower Main | 5 | 7 |
| Pahsimeroi River | 0 | 8 |
| East Fork Salmon River | 0 | 8 |
| Yankee Fork Salmon River | 0 | 8 |
| Valley Creek | 1 | 8 |
| Salmon River Upper Main | 0 | 9 |

*Fish Counting Stations*

Determination of adult spawner abundance is a critical aspect of a viable population management strategy (Foose et al. 1995, Botkin et al. 2000), which is recognized within the scientific community for listed species recovery planning (NMFS 2000, NMFS 2002, McElhaney et al. 2000), and for effective resource management. Several methods of counting adult Chinook salmon are employed in Idaho, they include picket or permanent weirs associated with fish traps, videography or sonar. Picket weirs operated in conjunction with fish traps provide more information about migrating salmon than any other method. All of these methods allow accurate and precise estimation of run-timing and total escapement. The use of adult fish counting stations will validate preseason forecasts by population and allow us to determine harvest impacts with higher resolution.

Fish counting stations should be operated from May – September each year, as conditions allow. Most temporary picket weirs and fish traps are not installed until the hydro-graph recedes past the spring high water event; typically in late June – early July. Permanent weirs and traps are usually installed/operated one week prior to the first anticipated trapping event. All methods usually cease after seven consecutive days of no fish encountered in late August –September.

Multiple agencies operate fish traps, videography, and sonar stations in the South Fork and Upper Salmon River MPGs, with 4/4 and 4/9 FMAs covered, respectively. There are no fish counting stations in the Middle Fork MPG (Figure 10). Data collected at fish counting stations may include date, number of fish trapped, length, gender, age, mark, scale/tissue samples, PIT tags, CWTs, and other external marks. This information is now available to the co-managers at an IDFG website.

We will request fish count data collected by co-managers at existing fish traps, videography, and sonar sites to assess accuracy of forecasts and run-timing predictions while we develop our M & E program. Hatchery and natural-origin adult escapement data is used to assess performance at the population level and provide evaluations on distribution within and between years.

Our long-term goal is to implement adult fish counting stations in several populations located in the Middle Fork and Upper Salmon MPGs to provide necessary data on run-timing and escapement (Figure 10). Our plan includes continuing use of a weir located in Yankee Fork. We also plan to operate adult fish counting stations using sonar in Valley, Big, Loon, Marsh, and Bear Valley creeks and weirs located in the Panther Creek and Lemhi River.

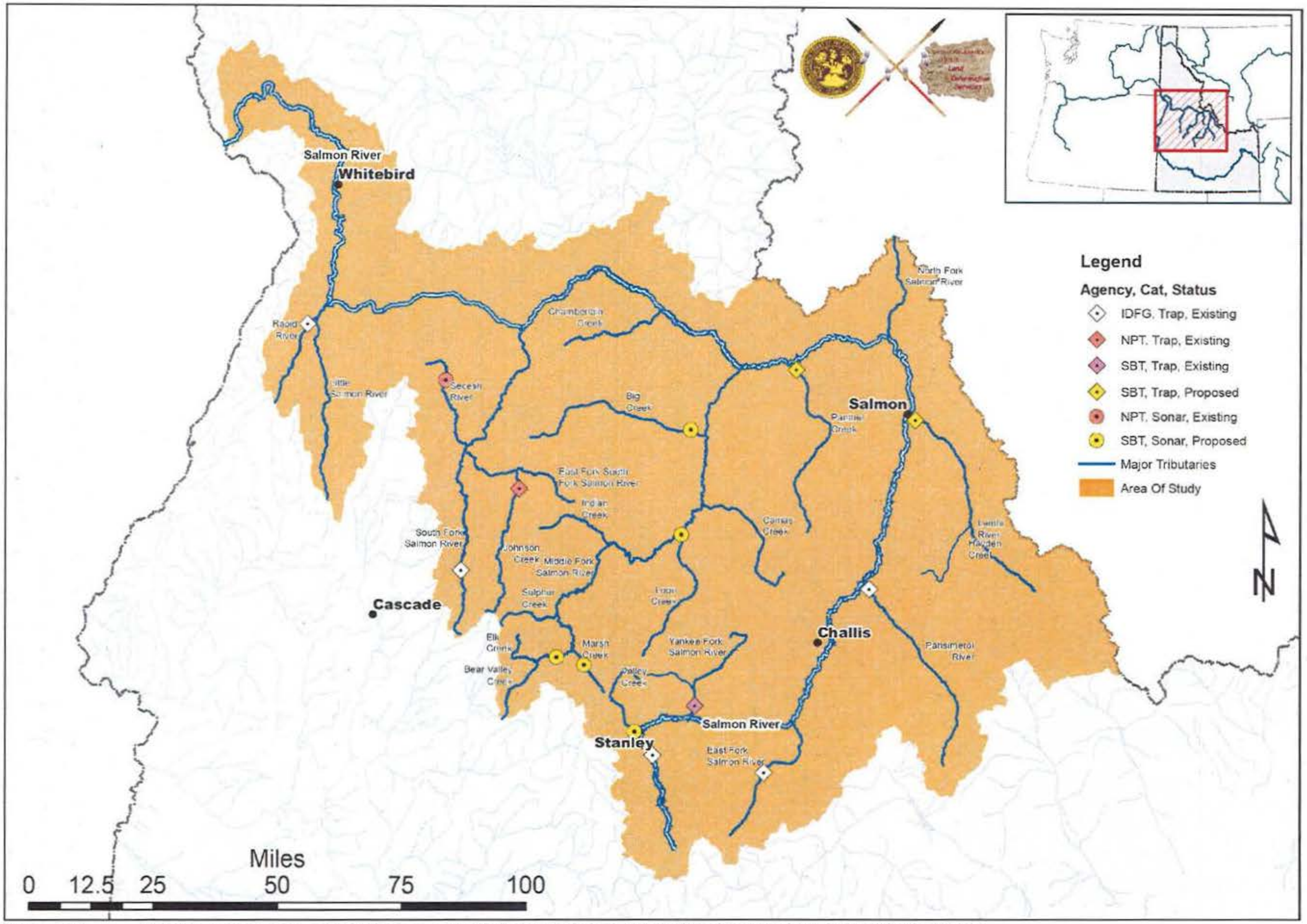


**Figure 10.** **Existing and proposed spring/summer Chinook salmon adult abundance monitoring sites in Idaho.**

*Spawning Ground Surveys*

As the product only of reproductive adults, redd counts provide an index of effective population size (Meffe 1986). While redd counts are commonly used to index adult escapement and assess population trends (Beland 1996; Rieman and Myers 1997; Isaak et al. 2003), their accuracy as a measure of abundance has rarely been evaluated (Dunham et al. 2001). Maxwell (1999) suggests that the sources of counting errors involved in redd counts be identified and reduced before they will be useful for long-term monitoring. The Tribes propose to initiate multiple-pass spawning ground surveys for estimating adult escapement and identifying harvest impacts, followed by secondary use for forecasting and assessing productivity.

In Idaho, managers implement three methods of spawning ground surveys; one-pass, multiple-pass, or intensive, conducted either on the ground or by air. Data collected includes the number of redds observed on each date, total number of redds observed over the entire spawning season, location of redds, and carcass information which includes location, gender, otolith, tissue, scale, number of carcasses, length, internal or external mark, and percent spawned.

Timing of spawning ground surveys vary depending upon the method employed. Spawning ground surveys for spring/summer Chinook salmon typically occur from August through late-September, usually with one week variance. One-pass ground and/or aerial surveys are typically completed during the last week of spawning after the majority of redds have been constructed and are still visible. Multiple ground surveys are conducted bi-weekly with one survey conducted during the first, middle, and last weeks of spawning. Intensive ground surveys are conducted on a weekly basis or more. Each method may produce variable results, usually depending upon spawn timing and surveyor experience. Tribal biologist agree that intensive spawning ground surveys provide the most accurate and precise estimate of total escapement, followed by multiple-pass ground, single-pass ground, and aerial surveys; the same is true for information from carcass recoveries.

Multiple agencies implement spawning ground surveys in the Salmon River sub-basin. Single-pass aerial redd counts have been conducted by the IDFG since 1957, following the spatial and temporal design. Since 1992, the ISS project (BPA#1989098) collaborators have conducting multiple-pass spawning ground surveys within transects in the following major tributaries: Slate Creek (tributary near Riggins, Idaho); Secesh River; Johnson Creek; Lake Creek; South Fork Salmon River; Upper Salmon River; Bear Valley Creek; Marsh Creek; Lemhi River; North Fork Salmon River; Pahsimeroi River; Valley Creek; East Fork; Herd Creek; and, West Fork Yankee Fork. The Tribes perform multiple-pass spawning ground surveys in conjunction with ISS in West Fork Yankee Fork, East Fork Salmon River, Valley Creek, and Bear Valley Creek. In addition, the Salmon River Habitat Enhancement Program conducts multiple pass spawning ground surveys in Yankee Fork, Smiley, Slate, Elk (Valley Creek tributary), and Herd creeks.

Single-pass aerial surveys are conducted over 95% of suitable spawning habitat in Idaho. Spawn timing is highly variable between years and this method is not highly rated for estimating abundance within years. The Tribes utilize this data in areas where multiple-pass ground surveys are not feasible.

Multiple-pass spawning ground surveys provide accurate and precise estimates of redds. Our goal is to work with the co-managers to identify, on an annual basis, where multiple-pass spawning ground surveys will be conducted. We will assess whether we will need to supplement these surveys and/or implement new surveys to estimate total redds by FMA. In areas where adult fish counting stations are present we will use the fish count data, with redd count data to develop fish per redd values. This information will be used to assess escapement in areas without fish counting stations using an appropriate fish per redd value.

**Juvenile Abundance and Productivity**

Abundance will be estimated for juvenile Chinook salmon yearly and will provide information for assessing abundance and productivity. Estimation of Chinook salmon smolt numbers is an important component for managing Chinook salmon fisheries (Newcomb and Coon 2001). It is also important to estimate fish production for all stages of migrants, which in Idaho includes fry, parr, pre-smolt, and smolt. The abundance of the smolting cohort, coupled with expected or observed survival rates, aid in forecasting recruitment and give indices of expected returns for escapement and stock recruitment (Raymond 1988). The number of smolts produced annually may provide a relative index of the overall health of a watershed for coldwater species (Karr 1998).

Smolt survival studies have been a cornerstone of salmonid research in the Snake–Columbia River basin for more than three decades (Bickford and Skalski 2000). PIT tag (passive integrated transponder tag) release–recapture techniques (Skalski et al. 1998) used in the Snake–Columbia River basin are well suited to providing estimates of smolt survival through river reaches and entire hydroprojects (Muir et al. 2001). At some dams, smolts can be collected at turbine intake or juvenile bypass systems and survival can be estimated by SURvival under Proportional Hazards (SURPH) (Lady et al. 2001).

Methods used to sample emigrating smolts vary in their degree of success at accurately estimating numbers of emigrants (Newcomb and Comb 2001). Smolts are difficult to monitor because they migrate at night and during the spring when high flows from spring snowmelt and rain can be problematic for sampling. Methods used to monitor emigration and estimate smolt abundance include trapping with fyke nets, box traps, weirs and counting fences, screw traps, or inclined-screen smolt traps (fixed and floating; Wagner et al. 1963; Lister et al. 1969; Davis et al. 1980; Seelbach et al. 1984; DuBois et al. 1991; Seelbach and Miller 1993; Kennen et al. 1994; Orciari et al. 1994; Thedinga et al. 1994; Whalen et al. 1999); through mark-recapture to test for trapping efficiency (Seelbach 1987; Dempson and Stansbury 1991; Orciari et al. 1994; Whalen et al. 1999) and to estimate total smolt numbers (MacDonald and Smith 1980; Peven and

Hay 1989). Other methods include counting with electronic fish counters or PIT tag readers (Appleby and Tipping 1991; Beckman et al. 1998), hydroacoustics (Moore and Potter 1994; Vehanen et al. 1998), and observing with a camera or other imaging system device (Cousens et al. 1982).

*Rotary Screw Traps*

In Idaho, fry, parr, pre-smolt, and smolt outmigration data is achieved primarily through rotary screw traps, mark-recapture experiments, and PIT tags. Data is currently available for the South Fork and Upper Salmon River MPGs, with very little representation in the Middle Fork MPG. Multiple agencies collect this information in various tributaries (Figure 11), with 100% representation in the South Fork, 22% in the Middle Fork, and 44% in the Upper Salmon River.

Rotary screw traps provide a comprehensive approach to evaluating juvenile abundance and productivity. To fill data gaps in the Upper Salmon and Middle Fork MPGs, the Tribes propose to install and operate rotary screw traps in Camas Creek, Loon Creek, and Bear Valley Creek for the Middle Fork MPG in addition to Panther Creek, North Fork Salmon River, and Yankee Fork Salmon River within the Upper Salmon MPG (Figure 10).

**Spatial Structure and Genetic Diversity**

The geographic distribution and frequency of redds can provide an indicator of spatial structure. The dynamics of multiple, potentially interacting local populations, often described as "metapopulations" (Hanksi 1999), has emerged as a key consideration in conservation planning for salmonid fishes. Although understanding metapopulation dynamics in salmonid fishes is limited (Rieman and Dunham 2000), all models of spatially structured populations are characterized by some degree of synchrony, or correlation, among populations (Harrison and Taylor 1996). A low level correlation is often regarded as beneficial because habitat vacated by local extirpations can be recolonized by dispersal from nearby populations that were fluctuating out of phase . Conversely, a high level of correlation among populations can result in simultaneous extirpations when abundances are low and is predicted to decrease the probability of metapopulation persistence (Heino et al. 1997). Many aspects of reserve design and effective conservation thus hinge on understanding the level of synchrony that exist among local populations (e.g., Pickett and Thompson 1978; Moyle and Sato 1991; McElhaney et al. 2000).

The Tribes will work collectively with the relevant co-managers to determine overall spatial structure of redds recorded in annual spawning ground surveys. In addition, DNA will be collected and archived on carcasses recovered in spawning ground surveys, emigrating smolts collected at rotary screw traps, and adults sampled in Tribal harvest.

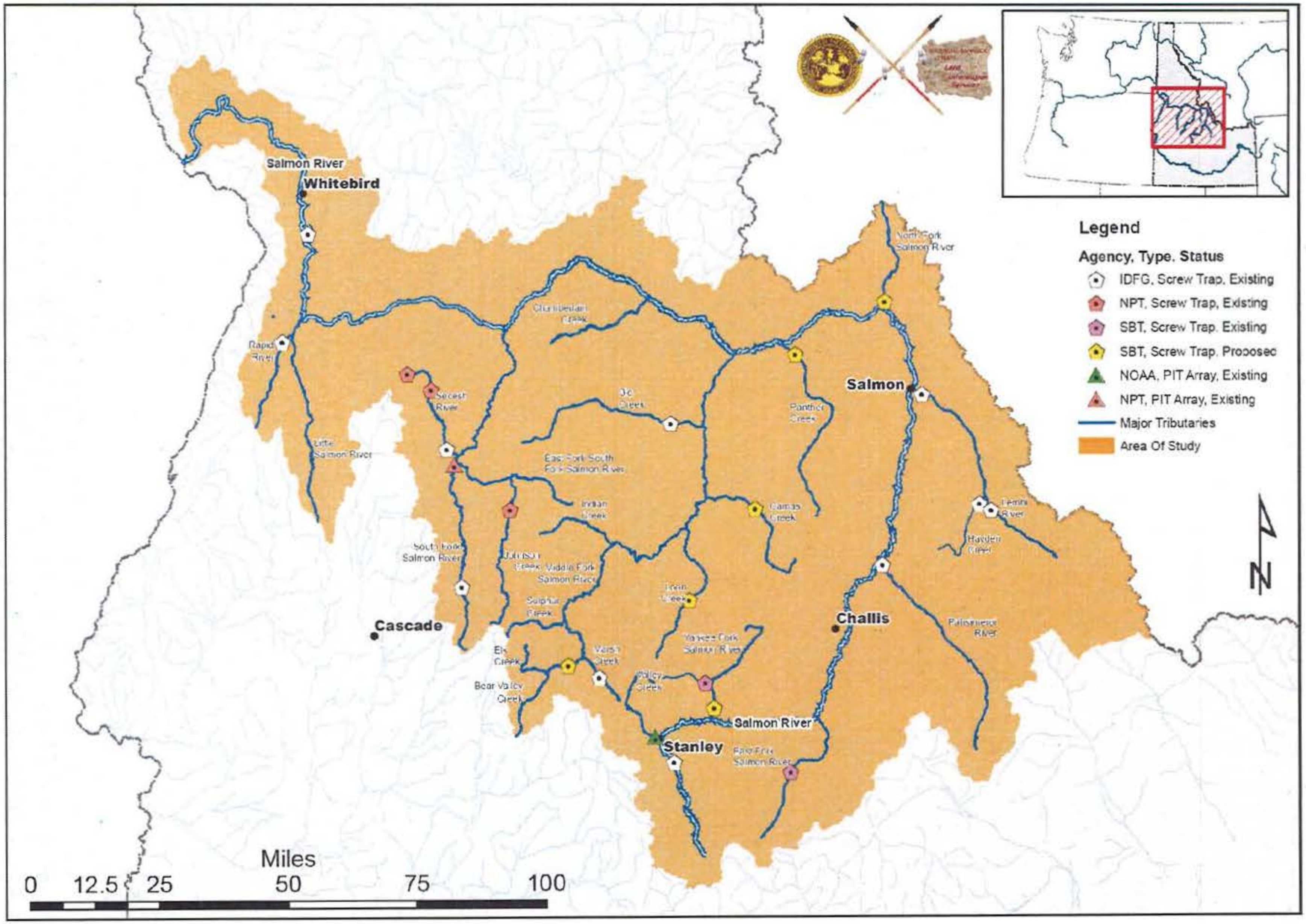


**Figure 11. Existing and proposed spring/summer Chinook salmon juvenile abundance monitoring locations in Idaho.**

## Summary

The M & E component will assess abundance, productivity, spatial structure, and genetic diversity within 22 FMAs. Performance metrics that include mainstem Columbia River harvest, dam counts, and harvest monitoring will be completed for each FMA and allow us to assess harvest monitoring at a minimum level. We will adaptively manage our harvest program and developed a Tier three M & E approach to collect additional data necessary for harvest management, but conditional upon funding. The conditional methods implemented under our M & E plan include fish counting stations, spawning ground surveys, and operation of rotary screw traps.

*Tier 1*

This category includes data collection from fish counting stations, spawning ground surveys, and rotary screw traps. FMAs included are Little Salmon River, South Fork Salmon River, Secesh River, East Fork South Fork Salmon River, Big Creek, Loon Creek, Bear Valley Creek, Marsh Creek, Panther Creek, Lemhi River, Pahsimeroi River, East Fork Salmon River, Yankee Fork Salmon River, Valley Creek, and Salmon River Upper Main (Table 10).

*Tier 2*

This category includes data collection from two of the following categories: fish counting stations; spawning ground surveys; and, rotary screw traps. FMAs included are Camas Creek and North Fork Salmon River (Table 10).

*Tier 3*

This category includes only data collection from spawning ground surveys. FMAs included are Chamberlain Creek, Middle Fork Lower Main, Middle Fork Upper Main, Sulphur Creek, Salmon River Lower Main (Table 10).

Table 9. Evalution of each FMA using the Three-tier management system.

| Code | Name | Tier # | Performance Indicators |
|---|---|---|---|
| | **South Fork Salmon River** | | |
| SRLSR | Little Salmon River | 1 | 1, 2, 3 |
| SFMAI | South Fork Salmon River | 1 | 1, 2, 3 |
| SFSEC | Secesh River | 1 | 1, 2, 3 |
| SFEFS | East Fork South Fork Salmon River | 1 | 1, 2, 3 |
| | **Middle Fork Salmon River** | | |
| SRCHA | Chamberlain Creek | 3 | 2 |
| MFLMA | Middle Fork Lower Main | 3 | 2 |
| MFBIG | Big Creek | 1 | 1, 2, 3 |
| MFCAM | Camas Creek | 2 | 2, 3 |
| MFLOO | Loon Creek | 1 | 1, 2, 3 |
| MFUMA | Middle Fork Upper Main | 3 | 2 |
| MFSUL | Sulphur Creek | 3 | 2 |
| MFBEA | Bear Valley Creek | 1 | 1, 2, 3 |
| MFMAR | Marsh Creek | 1 | 1, 2, 3 |
| | **Upper Salmon River** | | |
| SRNFS | North Fork Salmon River | 2 | 2, 3 |
| SRLEM | Lemhi River | 1 | 1, 2, 3 |
| SRLMA | Salmon River Lower Main | 3 | 2 |
| SRPAH | Pahsimeroi River | 1 | 1, 2, 3 |
| SREFS | East Fork Salmon River | 1 | 1, 2, 3 |
| SRYFS | Yankee Fork Salmon River | 1 | 1, 2, 3 |
| SRVAL | Valley Creek | 1 | 1, 2, 3 |
| SRUMA | Salmon River Upper Main | 1 | 1, 2, 3 |
| SRPAN | Panther Creek | 1 | 1, 2, 3 |

**Performance indicators**

1. Fish Counting Station
2. Spawning Ground Survey
3. Rotary Screw Trap

## EFFECTS ON ESA-LISTED SALMONIDS

Other fisheries exist outside the direct regulatory control of the Shoshone-Bannock Tribes that harvest the same populations of Snake River spring/summer Chinook in this TRMP. The State of Idaho and the Nez Perce Tribe conduct fisheries in the South Fork Salmon River, and the State of Idaho plans to conduct fisheries below Pahsimeroi and Sawtooth. IDFG and the NPT fisheries target hatchery-origin fish, and use catch-and-release methods to limit the harvest of natural-origin fish. Idaho harvests these same populations in interception fisheries that target the unlisted Rapid River hatchery-origin population in the main Salmon River below Riggins, Idaho. The Nez Perce Tribe also harvest on these same populations in the main Salmon River and in the Snake and Columbia rivers.

The states of Oregon and Washington conduct sport fisheries in the main Columbia River from the mouth up to the confluence with the Snake River. The states of Washington and Oregon also conduct commercial fisheries that intercept these populations in Zones 1-5 of the main Columbia River (from the mouth upriver to Bonneville Dam). The Nez Perce, Umatilla, Yakama, and Warm Springs tribes conduct ceremonial, subsistence, and commercial fisheries on these populations in Zone 6 (between Bonneville and McNary dams).

Ocean interception harvest of Snake River Spring/summer Chinook Salmon also occurs in the U.S. and in Canada. The ocean fisheries are both commercial and sport fisheries. Although these impacts have been reduced due to more conservative harvest rates inflicted on the fisheries due to the ESA listings, counter effects of larger and larger hatchery-origin populations, mass marking of hatchery-origin fish, new gear and selective fishing techniques, and decreased enforcement potentially mask some of the savings due to lower harvest rates. Increased monitoring of these interception fisheries is greatly needed in order to ascertain the level of impact these fisheries are actually having on the recovery and survival of the listed Snake River spring/summer Chinook salmon.

The Tribes expect NOAA-Fisheries to ensure harvest impacts in other specified fisheries listed above do not jeopardize the survival and recovery of the listed species, and, therefore, expect increased precision in harvest monitoring efforts to determine impacts.

**TRMP Revision Process**

The TRMP was developed to adaptively manage harvest of Snake River spring/summer Chinook salmon. The TRMP will be revised or modified accordingly to incorporate recommendations from recovery plans, harvest management plans, hatchery reviews, data reviews, FCRPS Biological Opinion, and amendments to the NPCC Fish and Wildlife Program.

The Tribes expect formal written notification by NOAA-Fisheries of any new technical information related to this TRMP or proposed harvest plans. With any new information, the Tribes and NOAA-Fisheries, in a government to government consultation, will determine whether modifications to this TRMP are necessary. Revisions will be developed and approved by the Fish and Game Commission.

**Five-Year Evaluation**

A comprehensive assessment of this TRMP will be conducted every five years (starting in 2014) in order to evaluate the efficacy of the plan. Adult and juvenile abundance data will be compiled and used to track population performance over time. The overall assessment will focus on whether the populations are trending to viability. If VPT is not being achieved then the Tribes plan to continue consultations to achieve sustainable recovery of the spring/summer Chinook salmon, while the Tribes continue to harvest.

The Tribes view the TRMP framework as a conservative harvest. The Tribes expect the federal government to reduce all other sources of mortality in order to ensure VPT is achieved. The Tribes will promote recovery of the species by: 1) initiating nutrient enrichment supplementation; 2) using artificial propagation; 3) restoring Snake River hydrograph to conditions closely representing natural riverine ecosystem; 4) promoting policies which reduce ocean and Columbia River harvest of Snake River spring/summer Chinook salmon.

## CONSISTENCY OF TRMP WITH COURT PROCEEDINGS

The Tribes' harvest guidelines are considered maximum harvest for the Salmon River sub-basin. The Tribes will coordinate their fishery intentions with the relevant co-managers and NOAA-Fisheries, with special emphasis and discussion on areas where multiple agencies elect to open fisheries. Coordination between the Tribes, co-managers, and NOAA-Fisheries will occur throughout the fishery.

The Tribes are full parties to the *U.S. v Oregon* (Civil No. 68-513 KI) proceeding and are affected by the long-term management agreement. In FMAs that are jointly shared with other co-managers, the *U.S. v Oregon* dispute resolution process may be used in order to achieve an equitable sharing of harvest allocation.

## AUTHORS

Lytle Denny, Shoshone-Bannock Tribes Anadromous Fish Program Manager/Biologist
Kurt Tardy, Shoshone-Bannock Tribes Anadromous Fish Biologist
Keith Kutchins, Shoshone-Bannock Tribes Anadromous Fish Biologist
Scott Brandt, Shoshone-Bannock Tribes Anadromous Fish Biologist

## REVIEWERS

Chad Colter, Claudeo Broncho, Dan Stone, Bill Bacon, Andy Kohler, Doug Taki, Heather Ray, Andrew Ray, Hunter Osborne, Mike Haddix

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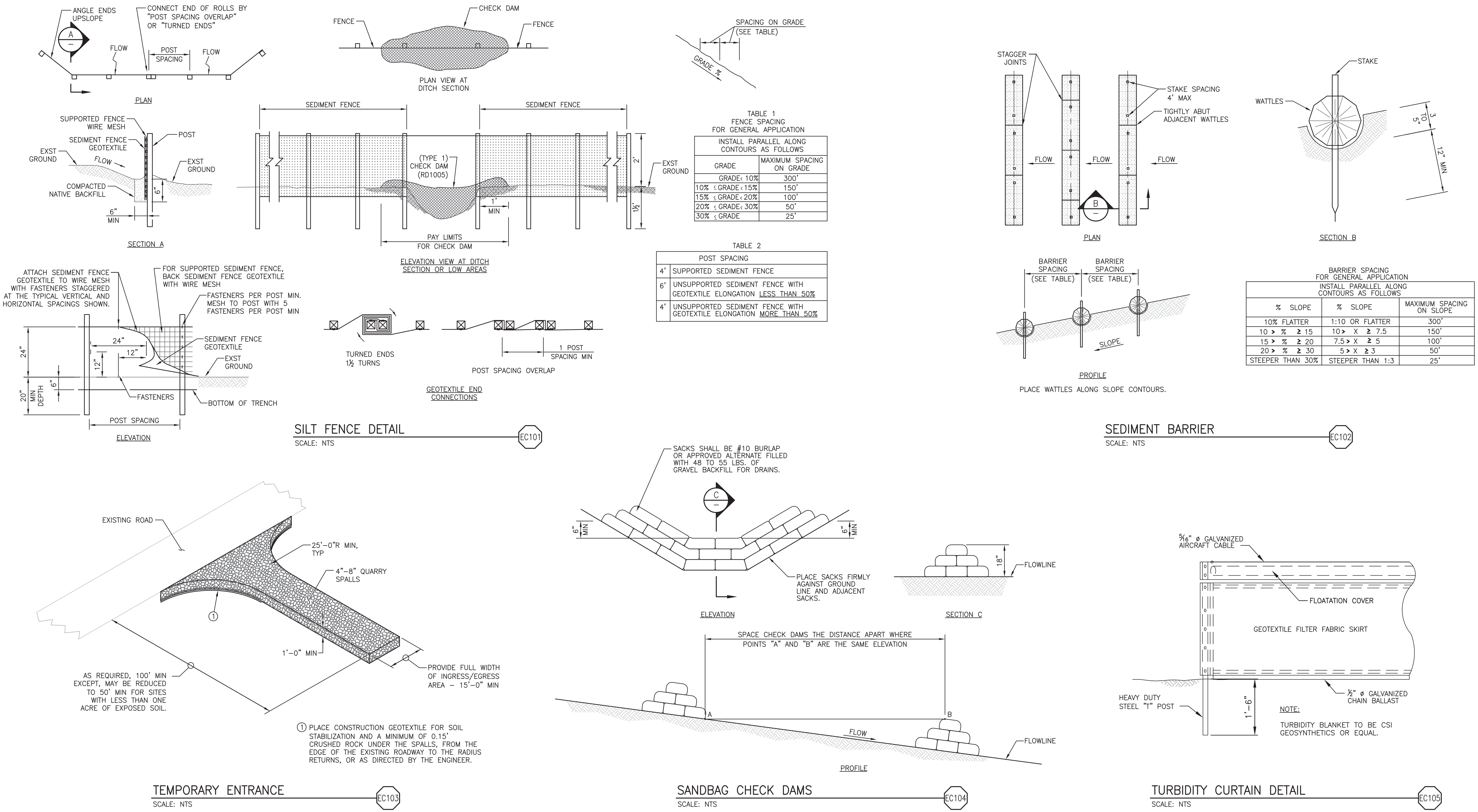



TABLE 1
FENCE SPACING
FOR GENERAL APPLICATION

| INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS | |
|---|---|
| GRADE | MAXIMUM SPACING ON GRADE |
| GRADE < 10% | 300' |
| 10% ≤ GRADE < 15% | 150' |
| 15% ≤ GRADE < 20% | 100' |
| 20% ≤ GRADE < 30% | 50' |
| 30% ≤ GRADE | 25' |

TABLE 2

| POST SPACING | |
|---|---|
| 4' | SUPPORTED SEDIMENT FENCE |
| 6' | UNSUPPORTED SEDIMENT FENCE WITH GEOTEXTILE ELONGATION LESS THAN 50% |
| 4' | UNSUPPORTED SEDIMENT FENCE WITH GEOTEXTILE ELONGATION MORE THAN 50% |

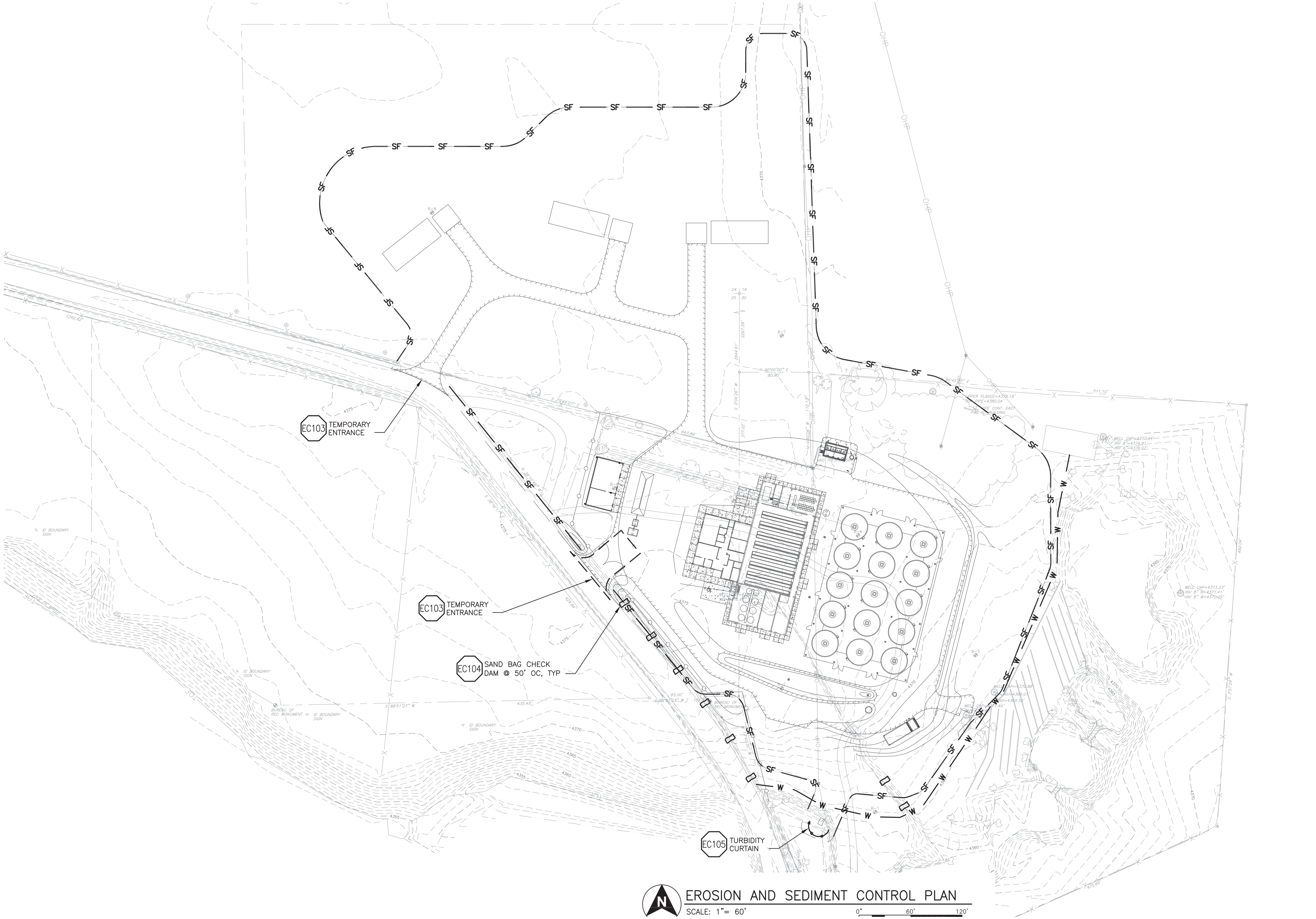
BARRIER SPACING
FOR GENERAL APPLICATION

| INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS | | |
|---|---|---|
| % SLOPE | % SLOPE | MAXIMUM SPACING ON SLOPE |
| 10% FLATTER | 1:10 OR FLATTER | 300' |
| 10 > % ≥ 15 | 10 > X ≥ 7.5 | 150' |
| 15 > % ≥ 20 | 7.5 > X ≥ 5 | 100' |
| 20 > % ≥ 30 | 5 > X ≥ 3 | 50' |
| STEEPER THAN 30% | STEEPER THAN 1:3 | 25' |

Source: McMillan LLC 2013.

Graphics …00269.14 (2/15/16) AB

**Figure C-1a**
**Erosion and Sediment Control Plan and Details for the Crystal Springs Hatchery**




EROSION CONTROL NOTES:

1. THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN FOR WORK DURING CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION, THAT MEETS ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
   A. ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER.
   B. ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.
   C. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (HYDROSEEDING, MULCHING OF STRAW, SAND DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS TO EXISTING PUBLIC OR PRIVATE ROADWAY OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS. SPECIAL ATTENTION SHALL BE GIVEN TO ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES NOTED ABOVE.
   D. THE GENERAL EROSION AND SEDIMENT CONTROL PLAN ON THIS DRAWING IS PROVIDED TO AID THE CONTRACTOR IN DEVELOPING THE EROSION AND SEDIMENT CONTROL PLAN ACCORDING TO CONTRACTOR SCHEDULE AND PHASING OF THE PROJECT.
2. CONTRACTOR SHALL INSTALL SILT FENCE AS INDICATED AND IN ANY ADDITIONAL LOCATIONS WHERE MATERIAL COULD LEAVE THE CONSTRUCTION SITE, AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
4. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES, FENCING, AND STAGING AREA MATERIALS WHEN CONSTRUCTION IS COMPLETE. NO CONSTRUCTION DEBRIS, DEMOLITION MATERIALS, OR EXCESS EQUIPMENT SHALL BE LEFT ON SITE.
5. CONTRACTOR SHALL REGRADE AND VEGETATE DISTURBED SLOPES TO NEAR EXISTING CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE. ALL FINISHED CONSTRUCTED SLOPES SHALL HAVE BIO-DEGRADABLE FIBER WATTLES INSTALLED AT THE TOE OF THE FINISHED SLOPE. IDEQ BMP-21.
6. ALL RUNOFF FROM SITE CONSTRUCTION ACTIVITIES AND FROM RAINFALL EVENTS SHALL BE DETAINED ON SITE AND FILTERED PRIOR TO DISCHARGE.
7. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT:
   A. TRACKING OF MUD AND DIRT ONTO ROADS. ROAD SWEEPING IS REQUIRED IF TRACKING OCCURS.
   B. ACCUMULATION OF CONSTRUCTION WASTE AND LITTER ON SITE.
   C. NO GRADING OR CONSTRUCTION ACTIVITIES SHALL OCCUR OUTSIDE OF THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS FOR THE PROJECT.
9. STOCKPILED EXCAVATION MATERIALS SHALL BE PROTECTED FROM WATER AND WIND EROSION BY COVERING AS APPROPRIATE.
10. THE SILT FENCE AND/OR WATTLES SHALL BE CONSTRUCTED PRIOR TO ANY CONSTRUCTION ACTIVITIES.
11. CONTRACTOR SHALL PROVIDE DUST ABATEMENT OVER ALL DISTURBED AREAS BY WATER SPRAY.
12. MINIMIZE DISTURBANCES TO EXISTING VEGETATION – UTILIZE AS NATURAL BUFFER STRIPS.
13. CONTRACTOR SHALL HAVE ONSITE AT ALL TIMES SPILL PREVENTION AND CONTROL MEASURES AS PER IDEQ BMP-10.

LEGEND:

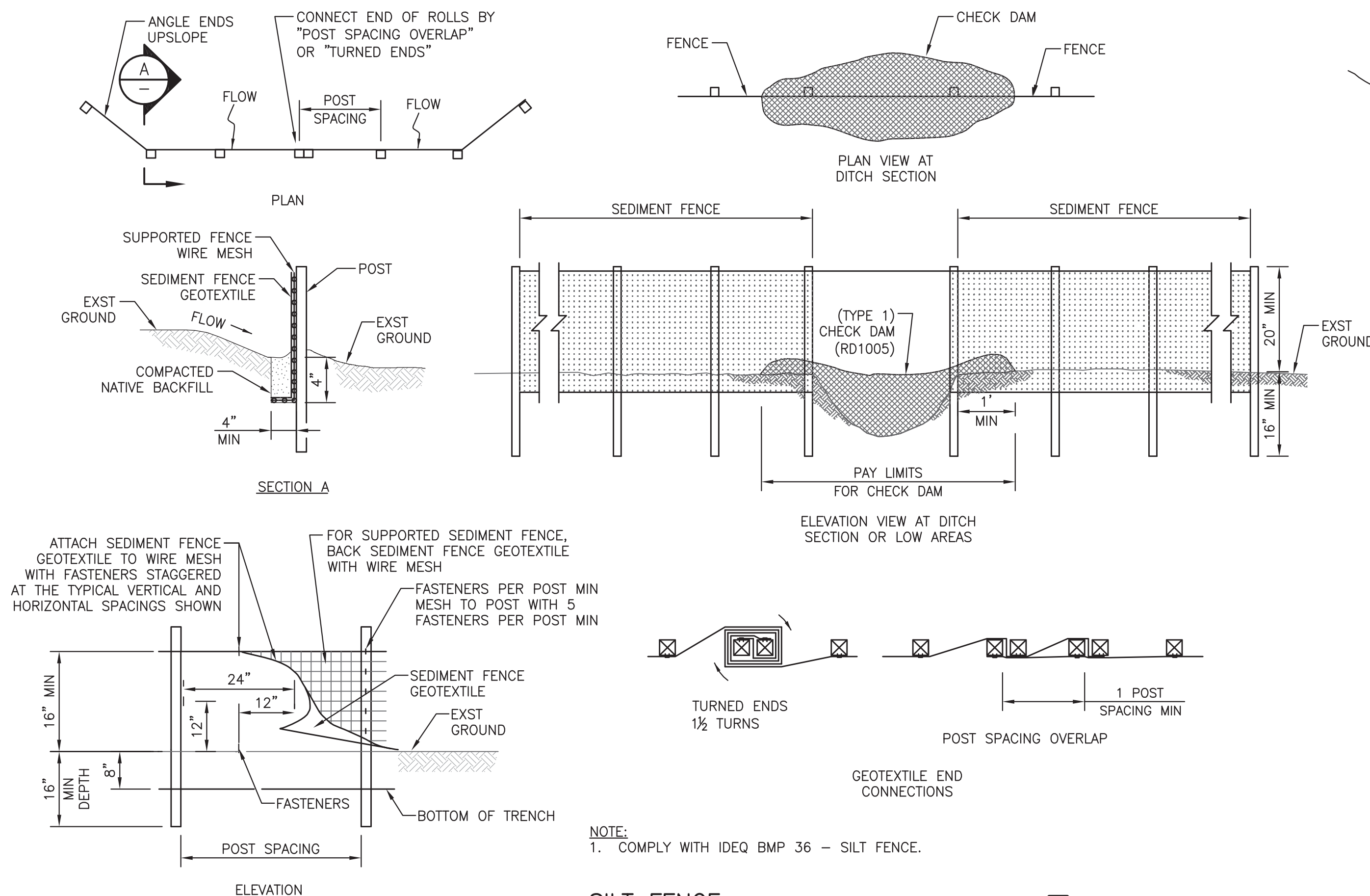
—— SF —— SILT FENCE EC101

—— W —— SEDIMENT BARRIER EC102

Source: McMillan LLC 2013.

Graphics ...00269.14 (2/15/16) AB

**Figure C-1b**
**Erosion and Sediment Control Plan and Details for the Crystal Springs Hatchery**



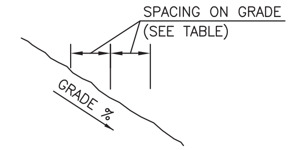




TABLE 1
FENCE SPACING
FOR GENERAL APPLICATION

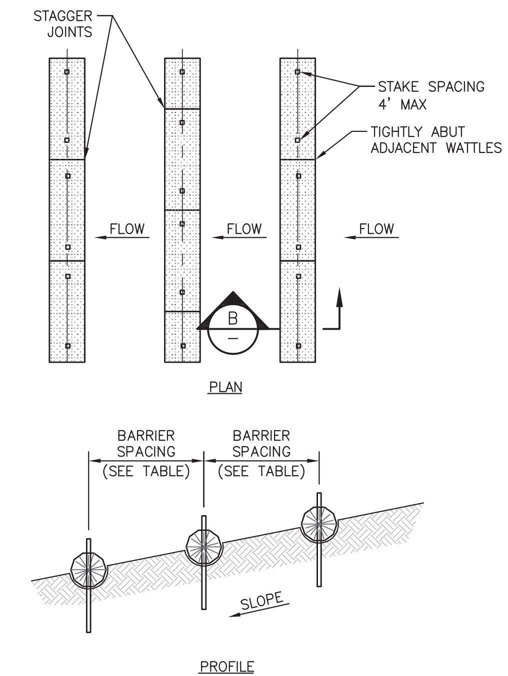
| INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS | |
|---|---|
| GRADE | MAXIMUM SPACING ON GRADE |
| GRADE< 10% | 300' |
| 10% ≤ GRADE< 15% | 150' |
| 15% ≤ GRADE< 20% | 100' |
| 20% ≤ GRADE< 30% | 50' |
| 30% ≤ GRADE | 25' |

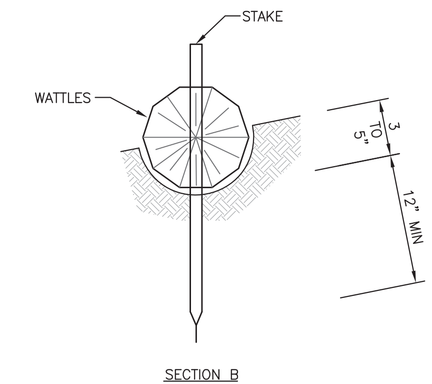
TABLE 2

| POST SPACING | |
|---|---|
| 10' | WIRE MESH SUPPORT FENCE |
| 6.5' | EXTRA STRENGTH GEOTEXTILE (WITHOUT WIRE FENCE) |

NOTE:
1. COMPLY WITH IDEQ BMP 36 – SILT FENCE.

SILT FENCE
SCALE: NTS
EC101



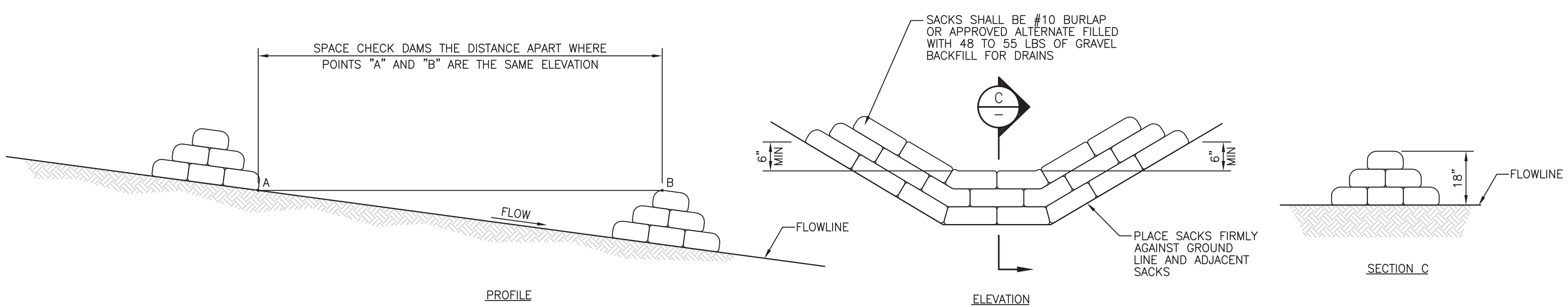

BARRIER SPACING
FOR GENERAL APPLICATION

| INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS | |
|---|---|
| SLOPE | MAXIMUM SPACING ON SLOPE |
| 4:1 OR FLATTER | 20' |
| 4:1 TO 2:1 | 15' |
| 2:1 OR GREATER | 10' |

PLACE WATTLES ALONG SLOPE CONTOURS

NOTE:
1. COMPLY WITH IDEQ BMP 35 – FIBER ROLLS.

SEDIMENT BARRIER
SCALE: NTS
EC102



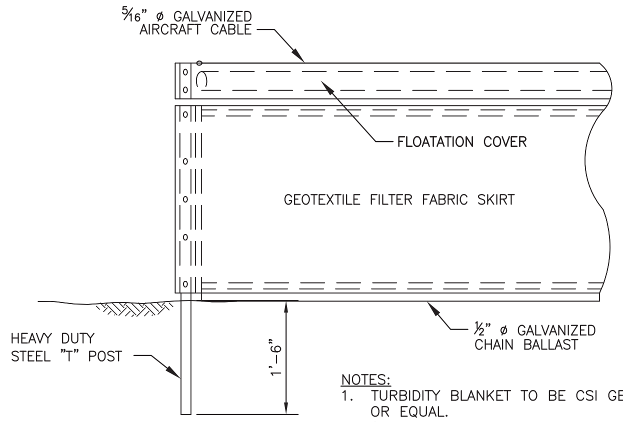

NOTE:
1. COMPLY WITH IDEQ BMP 32 – CHECK DAMS.

SANDBAG CHECK DAMS
SCALE: NTS
EC104

Source: McMillan LLC 2013.

Graphics ...00269.14 (2/15/16) AB

**Figure C-2a**
**Erosion and Sediment Control Plan and Details for the Yankee Fork Facility**



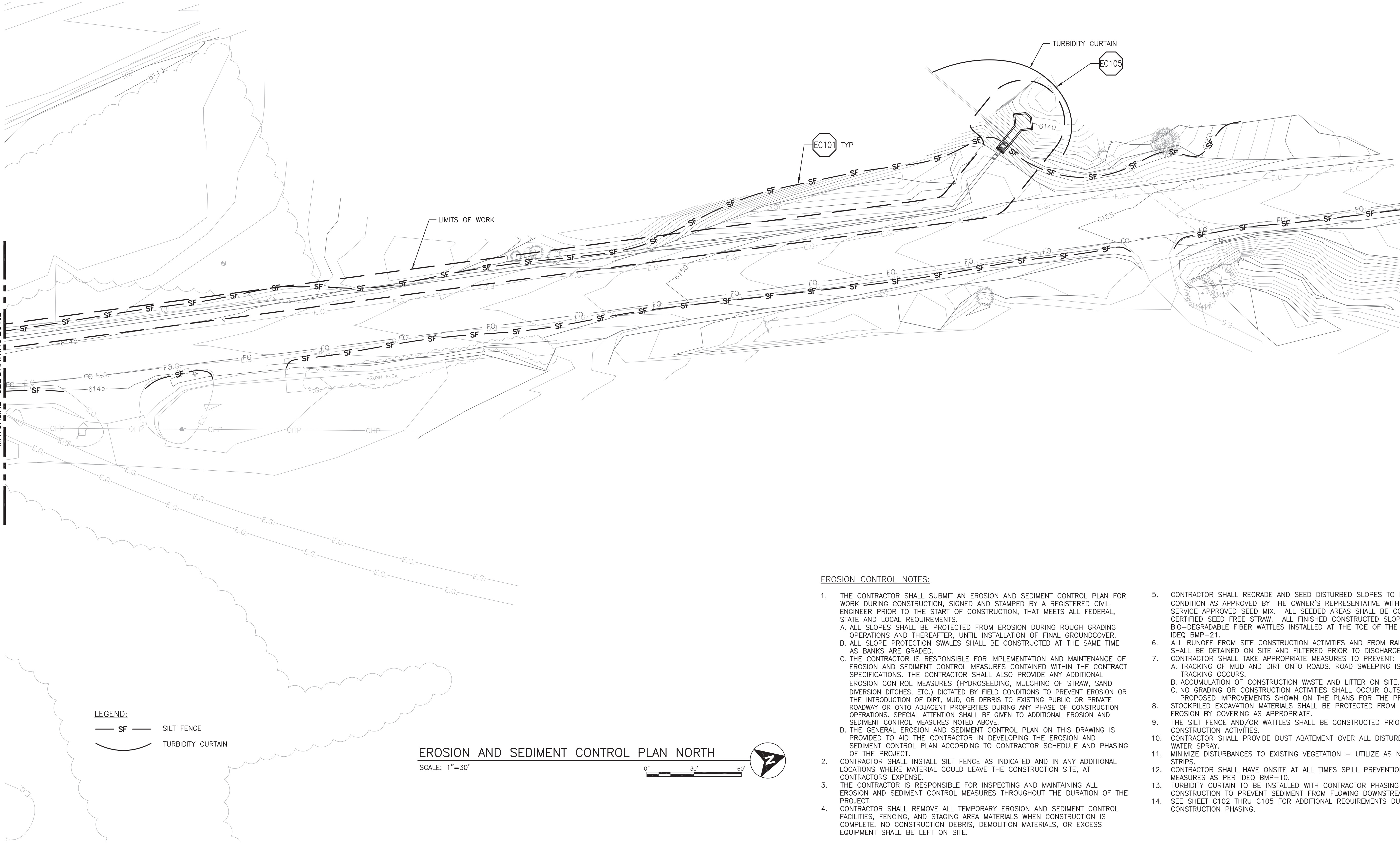

NOTES:
1. TURBIDITY BLANKET TO BE CSI GEOSYNTHETICS OR EQUAL.
2. COMPLY WITH IDEQ BMP 45 – INSTREAM SEDIMENT TRAPPING DEVICES.

TURBIDITY CURTAIN
SCALE: NTS
EC105

Source: McMillan LLC 2013.

Graphics ...00269.14 (2/15/16) AB

**Figure C-2b**
**Erosion and Sediment Control Plan and Details for the Yankee Fork Facility**




## EROSION AND SEDIMENT CONTROL PLAN NORTH

SCALE: 1"=30'

0' 30' 60'

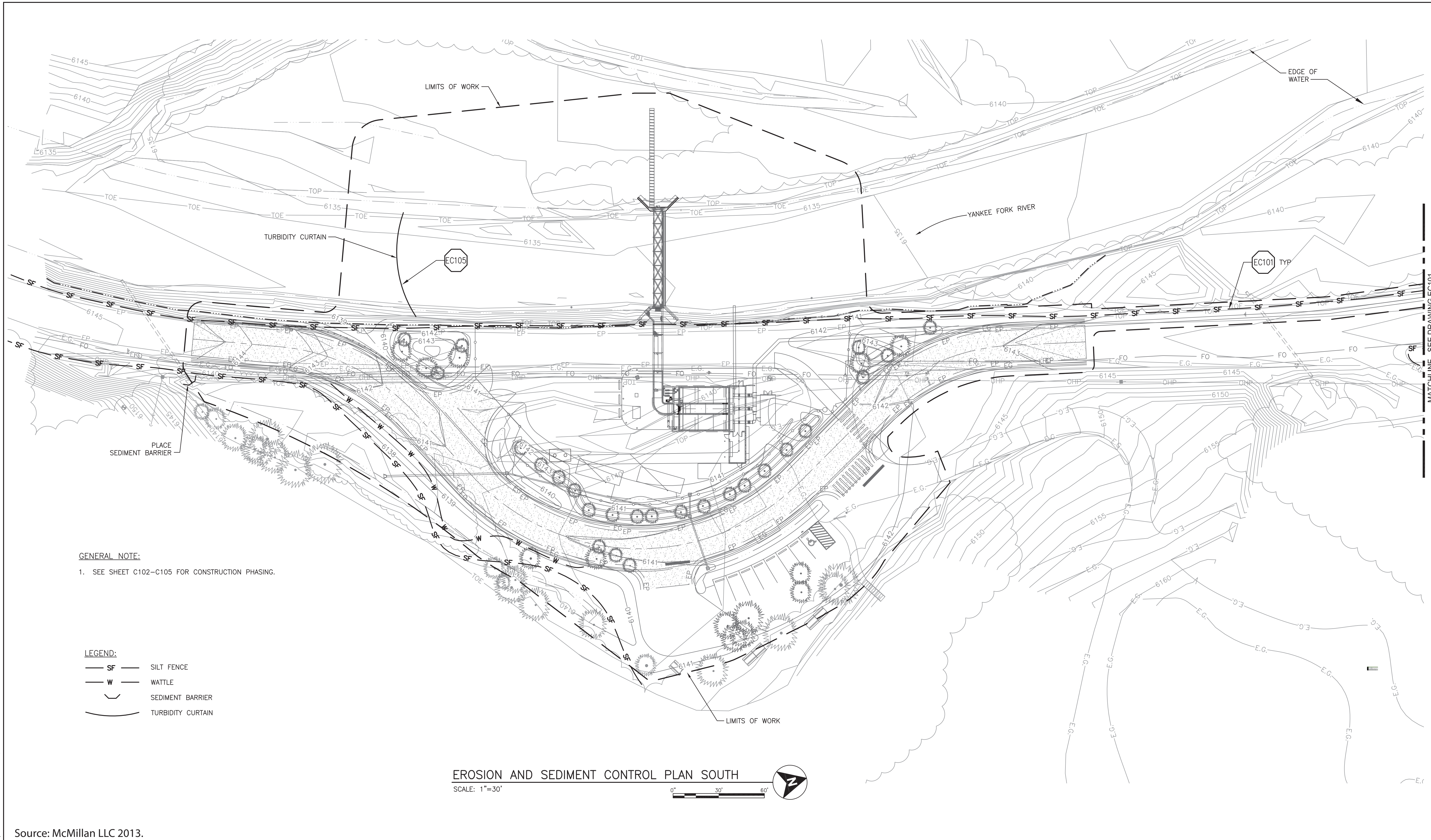
EROSION CONTROL NOTES:

1. THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN FOR WORK DURING CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION, THAT MEETS ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
   A. ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER.
   B. ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.
   C. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (HYDROSEEDING, MULCHING OF STRAW, SAND DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS TO EXISTING PUBLIC OR PRIVATE ROADWAY OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS. SPECIAL ATTENTION SHALL BE GIVEN TO ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES NOTED ABOVE.
   D. THE GENERAL EROSION AND SEDIMENT CONTROL PLAN ON THIS DRAWING IS PROVIDED TO AID THE CONTRACTOR IN DEVELOPING THE EROSION AND SEDIMENT CONTROL PLAN ACCORDING TO CONTRACTOR SCHEDULE AND PHASING OF THE PROJECT.
2. CONTRACTOR SHALL INSTALL SILT FENCE AS INDICATED AND IN ANY ADDITIONAL LOCATIONS WHERE MATERIAL COULD LEAVE THE CONSTRUCTION SITE, AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
4. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES, FENCING, AND STAGING AREA MATERIALS WHEN CONSTRUCTION IS COMPLETE. NO CONSTRUCTION DEBRIS, DEMOLITION MATERIALS, OR EXCESS EQUIPMENT SHALL BE LEFT ON SITE.
5. CONTRACTOR SHALL REGRADE AND SEED DISTURBED SLOPES TO NEAR EXISTING CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE WITH A US FOREST SERVICE APPROVED SEED MIX. ALL SEEDED AREAS SHALL BE COVERED WITH A CERTIFIED SEED FREE STRAW. ALL FINISHED CONSTRUCTED SLOPES SHALL HAVE BIO-DEGRADABLE FIBER WATTLES INSTALLED AT THE TOE OF THE FINISHED SLOPE. IDEQ BMP-21.
6. ALL RUNOFF FROM SITE CONSTRUCTION ACTIVITIES AND FROM RAINFALL EVENTS SHALL BE DETAINED ON SITE AND FILTERED PRIOR TO DISCHARGE.
7. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT:
   A. TRACKING OF MUD AND DIRT ONTO ROADS. ROAD SWEEPING IS REQUIRED IF TRACKING OCCURS.
   B. ACCUMULATION OF CONSTRUCTION WASTE AND LITTER ON SITE.
   C. NO GRADING OR CONSTRUCTION ACTIVITIES SHALL OCCUR OUTSIDE OF THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS FOR THE PROJECT.
8. STOCKPILED EXCAVATION MATERIALS SHALL BE PROTECTED FROM WATER AND WIND EROSION BY COVERING AS APPROPRIATE.
9. THE SILT FENCE AND/OR WATTLES SHALL BE CONSTRUCTED PRIOR TO ANY CONSTRUCTION ACTIVITIES.
10. CONTRACTOR SHALL PROVIDE DUST ABATEMENT OVER ALL DISTURBED AREAS BY WATER SPRAY.
11. MINIMIZE DISTURBANCES TO EXISTING VEGETATION – UTILIZE AS NATURAL BUFFER STRIPS.
12. CONTRACTOR SHALL HAVE ONSITE AT ALL TIMES SPILL PREVENTION AND CONTROL MEASURES AS PER IDEQ BMP-10.
13. TURBIDITY CURTAIN TO BE INSTALLED WITH CONTRACTOR PHASING OF NEW WEIR CONSTRUCTION TO PREVENT SEDIMENT FROM FLOWING DOWNSTREAM.
14. SEE SHEET C102 THRU C105 FOR ADDITIONAL REQUIREMENTS DURING CONSTRUCTION PHASING.

Source: McMillan LLC 2013.

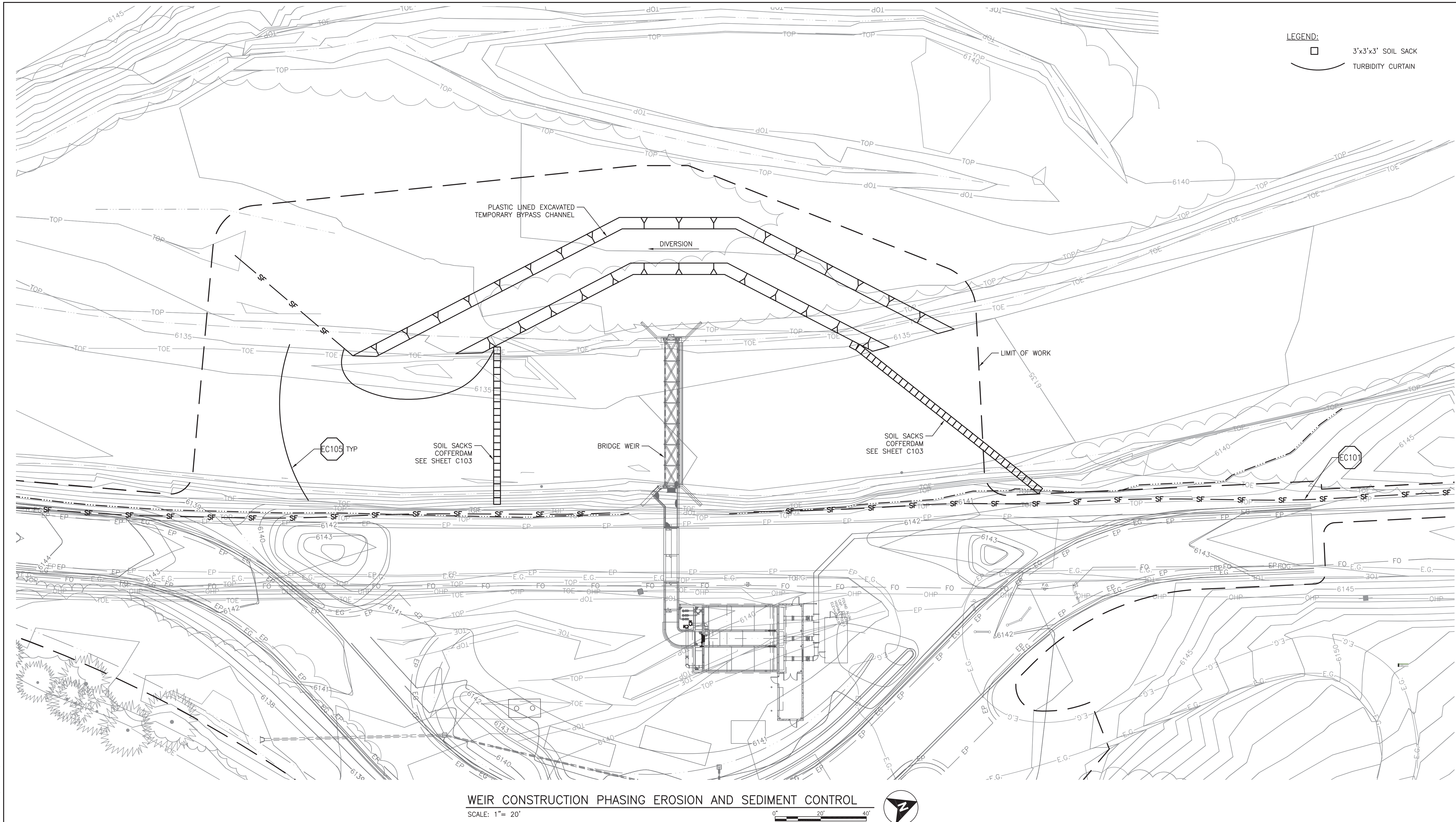
Graphics ...00269.14 (2/15/16) AB

**Figure C-2c**
**Erosion and Sediment Control Plan and Details for the Yankee Fork Facility**




Graphics ...00269.14 (2/15/16) AB

**Figure C-2d**
**Erosion and Sediment Control Plan and Details for the Yankee Fork Facility**




Source: McMillan LLC 2013.

Graphics ...00269.14 (2/15/16) AB

**Figure C-2e**
**Erosion and Sediment Control Plan and Details for the Yankee Fork Facility**

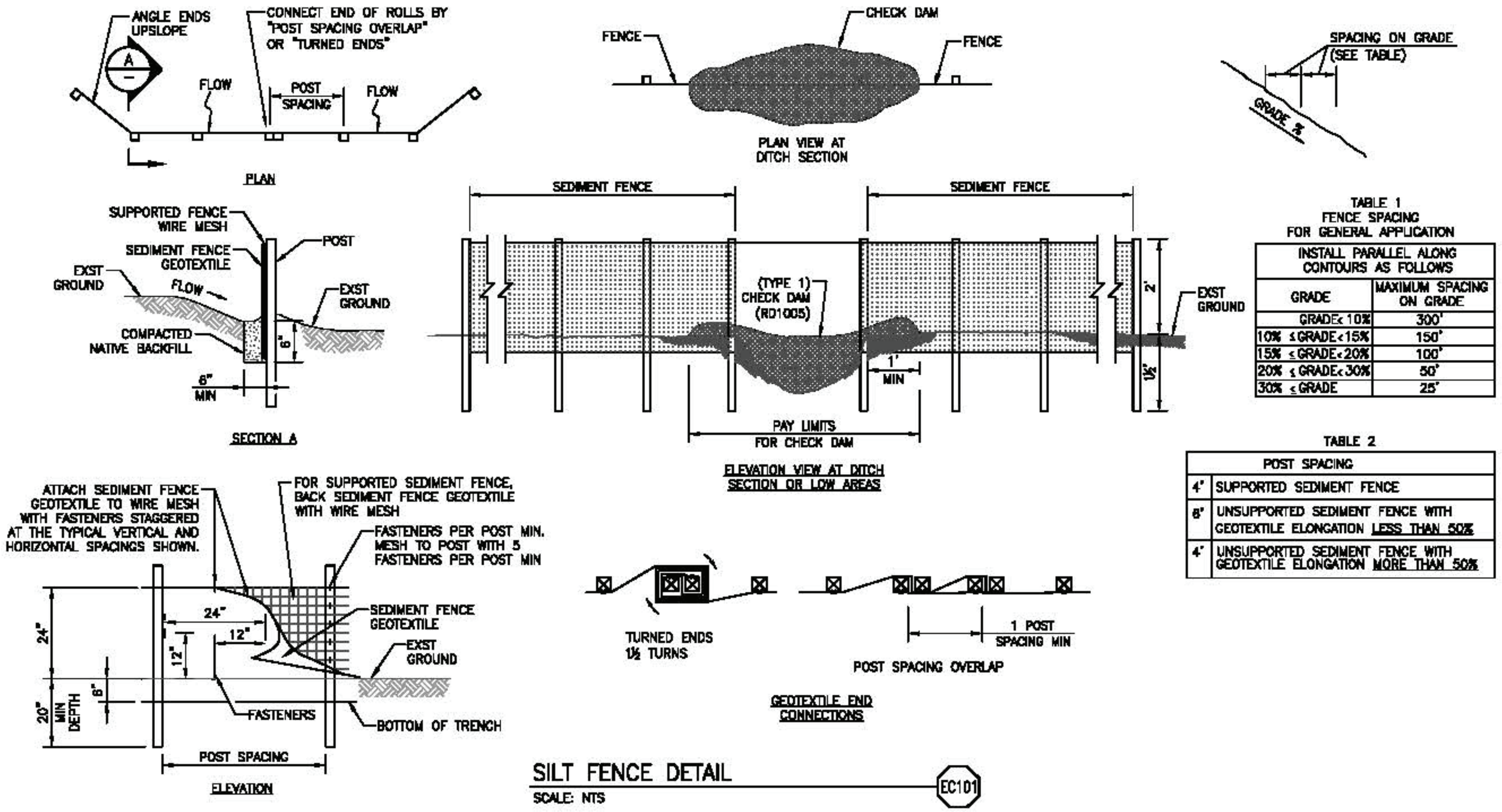


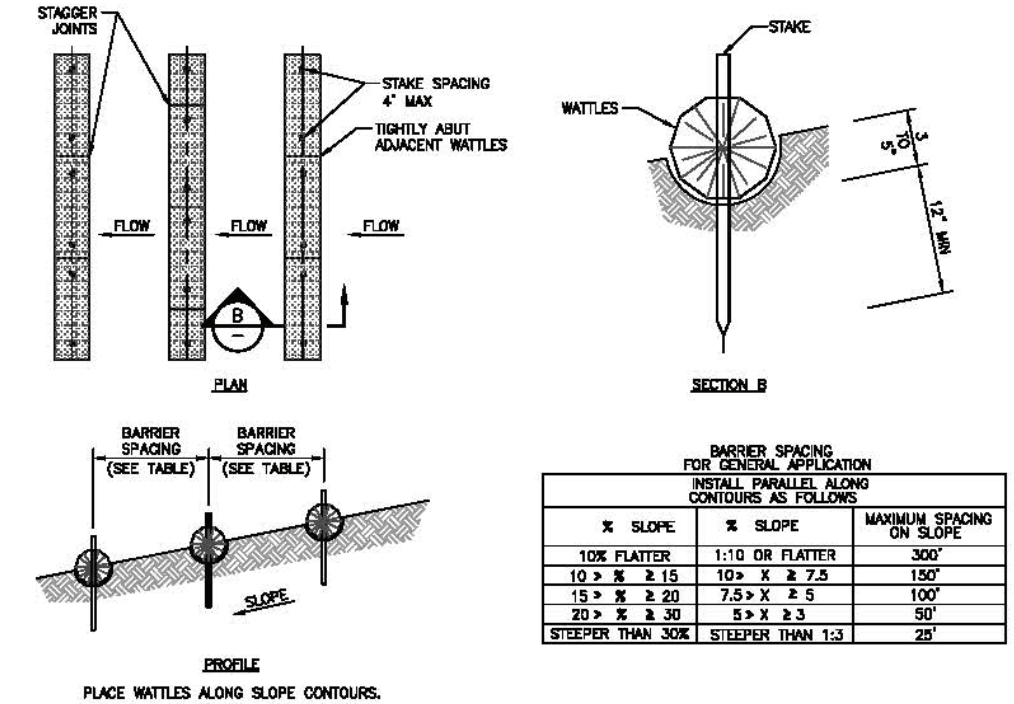

TABLE 1
FENCE SPACING
FOR GENERAL APPLICATION

| INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS | |
|---|---|
| GRADE | MAXIMUM SPACING ON GRADE |
| GRADE< 10% | 300' |
| 10% ≤ GRADE < 15% | 150' |
| 15% ≤ GRADE < 20% | 100' |
| 20% ≤ GRADE < 30% | 50' |
| 30% ≤ GRADE | 25' |

TABLE 2

| POST SPACING | |
|---|---|
| 4' | SUPPORTED SEDIMENT FENCE |
| 8' | UNSUPPORTED SEDIMENT FENCE WITH GEOTEXTILE ELONGATION LESS THAN 50% |
| 4' | UNSUPPORTED SEDIMENT FENCE WITH GEOTEXTILE ELONGATION MORE THAN 50% |

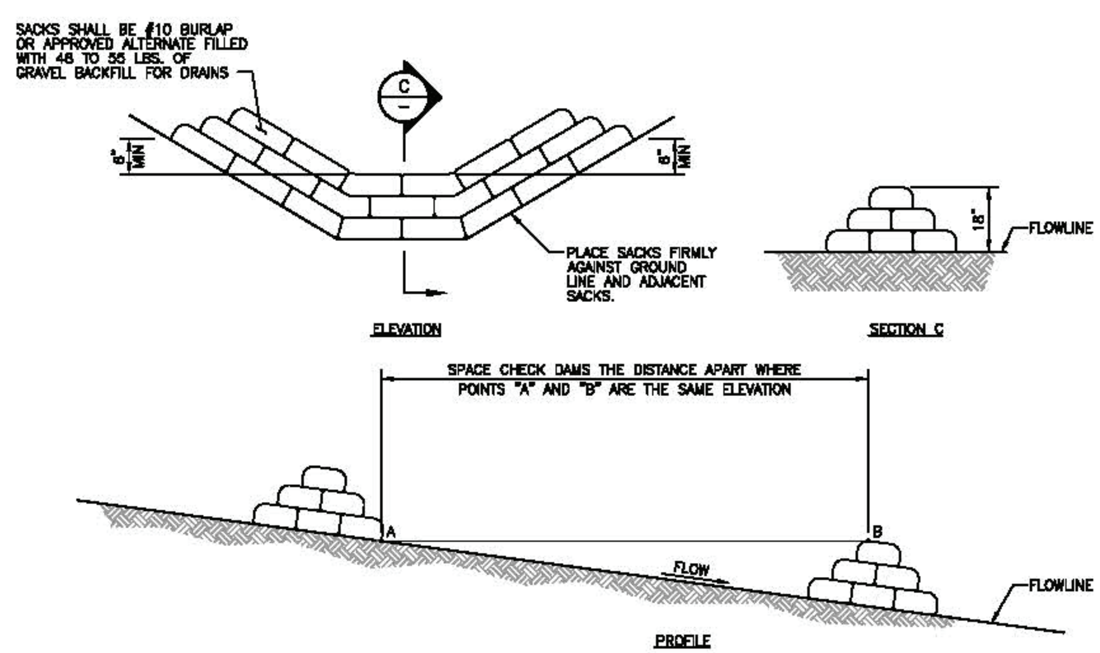
SILT FENCE DETAIL
SCALE: NTS
EC101



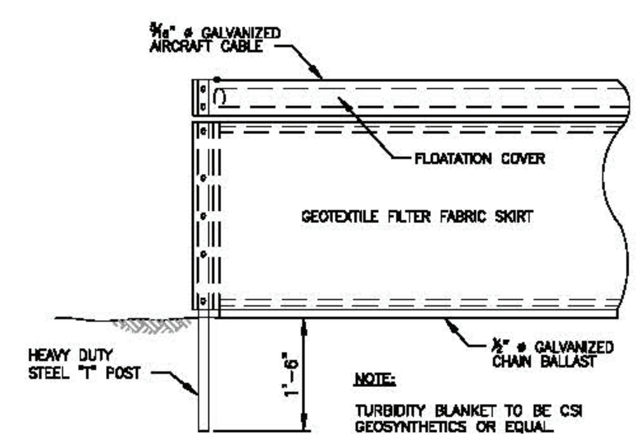

BARRIER SPACING
FOR GENERAL APPLICATION

| INSTALL PARALLEL ALONG CONTOURS AS FOLLOWS | | |
|---|---|---|
| % SLOPE | % SLOPE | MAXIMUM SPACING ON SLOPE |
| 10% FLATTER | 1:10 OR FLATTER | 300' |
| 10 > % ≥ 15 | 10> X ≥ 7.5 | 150' |
| 15 > % ≥ 20 | 7.5> X ≥ 5 | 100' |
| 20 > % ≥ 30 | 5 > X ≥ 3 | 50' |
| STEEPER THAN 30% | STEEPER THAN 1:3 | 25' |

SEDIMENT BARRIER
SCALE: NTS
EC102




SANDBAG CHECK DAMS
SCALE: NTS
EC104




TURBIDITY CURTAIN DETAIL
SCALE: NTS
EC105

Source: McMillan LLC 2013.

Graphics …00269.14 (2/15/16) AB

**Figure C-3a**
**Erosion and Sediment Control Plan and Details for the Panther Creek Facility**

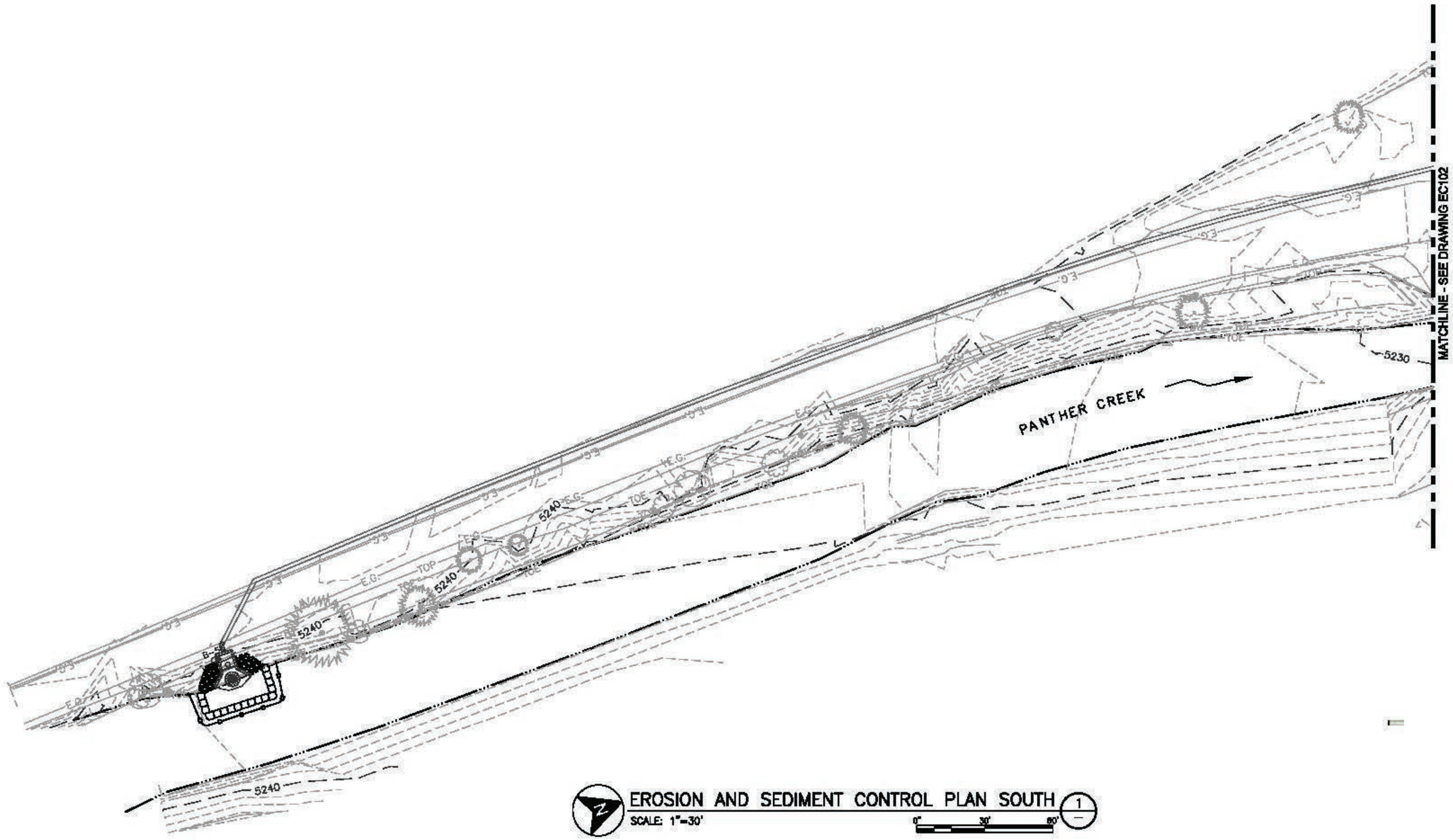
LEGEND:

SF — SILT FENCE

TURBIDITY CURTAIN

EDGE OF WATER – NOVEMBER, 2011

3'x3'x3' SOIL SACK




EROSION AND SEDIMENT CONTROL PLAN SOUTH

SCALE: 1"=30'

0' 30' 60'

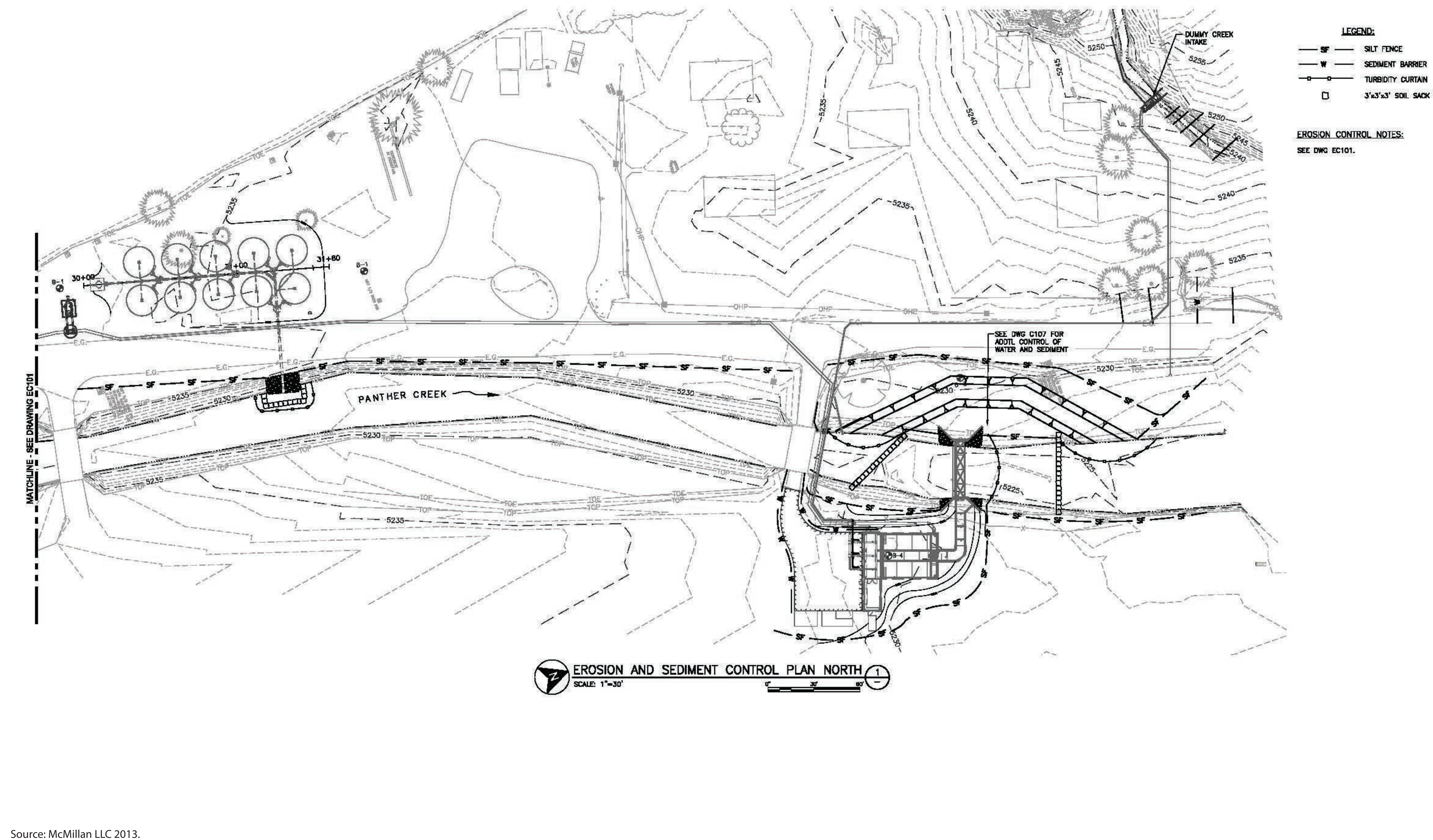
## EROSION CONTROL NOTES:

1. THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN FOR WORK DURING CONSTRUCTION, SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER PRIOR TO THE START OF CONSTRUCTION, THAT MEETS ALL FEDERAL, STATE AND LOCAL REQUIREMENTS.
   A. ALL SLOPES SHALL BE PROTECTED FROM EROSION DURING ROUGH GRADING OPERATIONS AND THEREAFTER, UNTIL INSTALLATION OF FINAL GROUNDCOVER.
   B. ALL SLOPE PROTECTION SWALES SHALL BE CONSTRUCTED AT THE SAME TIME AS BANKS ARE GRADED.
   C. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL MEASURES CONTAINED WITHIN THE CONTRACT SPECIFICATIONS. THE CONTRACTOR SHALL ALSO PROVIDE ANY ADDITIONAL EROSION CONTROL MEASURES (HYDROSEEDING, MULCHING OF STRAW, SAND DIVERSION DITCHES, ETC.) DICTATED BY FIELD CONDITIONS TO PREVENT EROSION OR THE INTRODUCTION OF DIRT, MUD, OR DEBRIS TO EXISTING PUBLIC OR PRIVATE ROADWAY OR ONTO ADJACENT PROPERTIES DURING ANY PHASE OF CONSTRUCTION OPERATIONS. SPECIAL ATTENTION SHALL BE GIVEN TO ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES NOTED ABOVE.
   D. THE GENERAL EROSION AND SEDIMENT CONTROL PLAN ON THIS DRAWING IS PROVIDED TO AID THE CONTRACTOR IN DEVELOPING THE EROSION AND SEDIMENT CONTROL PLAN ACCORDING TO CONTRACTOR SCHEDULE AND PHASING OF THE PROJECT.
2. CONTRACTOR SHALL INSTALL SILT FENCE AS INDICATED AND IN ANY ADDITIONAL LOCATIONS WHERE MATERIAL COULD LEAVE THE CONSTRUCTION SITE, AT CONTRACTORS EXPENSE.
3. THE CONTRACTOR IS RESPONSIBLE FOR INSPECTING AND MAINTAINING ALL EROSION AND SEDIMENT CONTROL MEASURES THROUGHOUT THE DURATION OF THE PROJECT.
4. CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL FACILITIES, FENCING, AND STAGING AREA MATERIALS WHEN CONSTRUCTION IS COMPLETE. NO CONSTRUCTION DEBRIS, DEMOLITION MATERIALS, OR EXCESS EQUIPMENT SHALL BE LEFT ON SITE.
5. CONTRACTOR SHALL REGRADE AND VEGETATE DISTURBED SLOPES TO NEAR EXISTING CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE. ALL FINISHED CONSTRUCTED SLOPES SHALL HAVE BIO-DEGRADABLE FIBER WATTLES INSTALLED AT THE TOE OF THE FINISHED SLOPE. IDEQ BMP-21.
6. ALL RUNOFF FROM SITE CONSTRUCTION ACTIVITIES AND FROM RAINFALL EVENTS SHALL BE DETAINED ON SITE AND FILTERED PRIOR TO DISCHARGE.
7. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PREVENT:
   A. TRACKING OF MUD AND DIRT ONTO ROADS. ROAD SWEEPING IS REQUIRED IF TRACKING OCCURS.
   B. ACCUMULATION OF CONSTRUCTION WASTE AND LITTER ON SITE.
   C. NO GRADING OR CONSTRUCTION ACTIVITIES SHALL OCCUR OUTSIDE OF THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS FOR THE PROJECT.
9. STOCKPILED EXCAVATION MATERIALS SHALL BE PROTECTED FROM WATER AND WIND EROSION BY COVERING AS APPROPRIATE.
10. THE SILT FENCE AND/OR WATTLES SHALL BE CONSTRUCTED PRIOR TO ANY CONSTRUCTION ACTIVITIES.
11. CONTRACTOR SHALL PROVIDE DUST ABATEMENT OVER ALL DISTURBED AREAS BY WATER SPRAY.
12. MINIMIZE DISTURBANCES TO EXISTING VEGETATION – UTILIZE AS NATURAL BUFFER STRIPS.
13. CONTRACTOR SHALL HAVE ONSITE AT ALL TIMES SPILL PREVENTION AND CONTROL MEASURES AS PER IDEQ BMP-10.
14. TURBIDITY CURTAIN TO BE INSTALLED WITH CONTRACTOR PHASING OF NEW WEIR CONSTRUCTION TO PREVENT SEDIMENT FROM FLOWING DOWNSTREAM.

Source: McMillan LLC 2013.

Graphics ...00269.14 (2/15/16) AB

**Figure C-3b**
**Erosion and Sediment Control Plan and Details for the Panther Creek Facility**




Source: McMillan LLC 2013.



**Figure C-3c**
**Erosion and Sediment Control Plan and Details for the Panther Creek Facility**

# Appendix D
## National Wild and Scenic Rivers Analysis

# Appendix D
## National Wild and Scenic Rivers Analysis

Appendix D contains the Wild and Scenic Rivers Act, Section 7 analysis for Yankee Fork of the Salmon River (Appendix D.1) and Panther Creek (Appendix D.2).

The information from Appendix D has been synthesized into Chapter 3, *Affected Environment and Environmental Consequences*, of this Environmental Impact Statement. The table below identifies where the discussion and effects analysis of each outstandingly remarkable value (ORV) can be found in the Environmental Impact Statement.

| River | Outstandingly Remarkable Value (ORV) | Where to find |
|---|---|---|
| Yankee Fork | | |
| | Free-flowing character | Section 3.1, *Land Use and Recreation*<br>Section 3.5, *Groundwater and Surface Water Quality and Quantity* |
| | Recreation | Section 3.1, *Land Use and Recreation* |
| | Geology | Section 3.3, *Geology and Soils* |
| | Fish | Section 3.7, *Fish* |
| | History | Section 3.9, *Cultural Resources* |
| Panther Creek | | |
| | Free-flowing character | Section 3.1, *Land Use and Recreation*<br>Section 3.5, *Groundwater and Surface Water Quality and Quantity* |
| | Scenery | Section 3.12, *Visual Quality* |
| | Recreation | Section 3.1, *Land Use and Recreation* |
| | Geology | Section 3.3, *Geology and Soils* |
| | Fish | Section 3.7, *Fish* |
| | Wildlife | Section 3.8, *Wildlife* |

**Appendix D.1**

Yankee Fork Segment A

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

# Yankee Fork Permanent Weir and Fish Trapping Facility

## Wild and Scenic River, Section 7 Analysis

July 2016

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# 1 Introduction

## 1.1 Background

The U. S. Forest Service (Forest Service) and Bonneville Power Administration (BPA) are evaluating a proposal from the Shoshone-Bannock Tribes of the Fort Hall Reservation (Tribes) to place a permanent fish collection and acclimation facility on the Yankee Fork. This facility is part of a larger program that BPA is analyzing in the Crystal Springs Hatchery Program Environmental Impact Statement (EIS). For the purposes of this Section 7 analysis, the term "Proposed Action" will refer to just the Yankee Fork weir facility rather than the entire program being evaluated in the EIS.

Yankee Fork has been determined by the Challis National Forest (Forest) to be eligible for designation under the Wild and Scenic Rivers Act, 16 U.S.C. 1271 *et seq.*, as a Recreation Wild and Scenic River (USFS 1989). As part of the agencies' evaluation of the Tribes' proposal, this analysis is being conducted to identify the effects the constructed facility might have on the Yankee Fork's values that make it eligible for designation as a Wild and Scenic River.

### 1.1.1 Classification and Protection Status of Yankee Fork

Two[1] eligible segments of the river relevant to this analysis are listed in the National Park Service's Nationwide Rivers Inventory[2] (Table 1). Segment A is the lower reach immediately upstream from the mouth; segment B is immediately upstream of segment A, from the private land boundary upstream of Pole Flat campground to Jordan Creek. The Proposed Action is within Segment A, very near its boundary with Segment B.

**Table 1. Description of eligible reaches of Yankee Fork from the Nationwide Rivers Inventory**

| River | **Yankee Fork, segment A** | **Yankee Fork, segment B** |
|---|---|---|
| County | Custer | Custer |
| Reach | Mouth at Main Salmon River (NW 1/4 of Sec. 20, T.11 N., R.15 E.) to Pole Flat Campground (beginning of dredge tailings) | Pole Flat Campground to Jordan Creek |
| Length (miles) | 2 | 6 |
| Year Listed / Updated | 1993 | 1993 |
| Potential Classification | Recreation | Recreation |
| Outstandingly Remarkable Values | Recreation, Geology, Fish, History, Cultural | Recreation, Geology, Fish, History |

[1] Three Segments of Yankee Fork were found eligible, Segments A, B, and C. Segment C is upstream from segment B, and far removed from Segment A and will thus not be discussed in this assessment.

[2] NPS Nationwide Rivers Inventory, at http://www.nps.gov/ncrc/programs/rtca/nri/states/id2.html

| River | **Yankee Fork, segment A** | **Yankee Fork, segment B** |
|---|---|---|
| **Description** | "Native American religious and ceremonial fishery. Challenging white water for kayaking during high spring run-off. Spawning and rearing habitat for anadromous steelhead and Chinook salmon." | "Native American religious and ceremonial fishery. Challenging white water for kayaking during high spring run-off. Spawning and rearing habitat for anadromous steelhead and Chinook salmon" |

While the segments of Yankee Fork have been determined to be "eligible," they have not yet been "designated." ***Eligibility*** is simply a determination made by a river-managing federal agency that this segment meets certain criteria and may be suitable for designation. ***Designation*** is only by an act of Congress or a State's application to the Secretary of the Interior. It is by designation that an eligible river attains Wild and Scenic River status and protection. Eligible rivers are not protected by the Act, but Forest Service policy is that a river found to be eligible and suitable[3] must be protected as far as possible to the same extent as a congressionally designated study river.[4] Forest Service policy for river corridors identified in the National River Inventory is to protect the river's free flowing characteristics and its Outstandingly Remarkable Values; and that management and development of the identified river and its corridor not be modified to the degree that eligibility or classification would be affected. This policy of protection is to be continued until a decision is made as to the future use of the river and adjacent lands.[5]

Section 7(a) of the Wild and Scenic Rivers Act provides a specific standard for review of developments below or above or on a stream tributary to a designated river. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation."

### 1.1.2 Description of the Yankee Fork

The Yankee Fork is a major tributary to the upper reaches of the Salmon River. The two segments of the Yankee Fork discussed here extend from its confluence with the Salmon River (at Idaho Highway 75 between the towns of Stanley and Clayton) upstream to Jordan Creek, a distance of 8 miles (straight line). The Tribe's proposal is located at Pole Flat Campground, 3.3 river miles upstream from the confluence. This campground is just downstream of the dividing point between these two eligible segments and is immediately upstream of the site proposed for this project.

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[3] 'Suitability' is the second level of analysis for a potential Wild and Scenic River. First is 'eligibility,' second is 'suitability,' then the forwarding of a 'suitable' river for legislative consideration, then possible Congressional designation as a Wild and Scenic River. A Suitability Determination has not been conducted for Yankee Fork.

[4] Forest Service Manual 2354.21

[5] FSH 1909.12, Chapter 8, Section 8.12

The project site is located near (below) the downstream extent of extensive historical gold dredging that left the river wider and straighter than pre-dredging conditions with most of its former floodplain now dominated by mounded cobbles and boulders (Figure 1).

**Figure 1. Historical dredge tailings along Yankee Fork**

Not coincidentally, this location is also where the river changes character from flowing through a 0.25-mile wide floodplain (segment B) to narrowing down and flowing with higher velocity through a steeper and narrower canyon (segment A). The dividing line between segments A and B is at the lower extent of the historical dredge tailings, above Pole Flat Campground (Figure 2). The Tribes' proposed permanent weir is situated immediately below Pole Flat Campground near an existing temporary weir within Segment A. Its location is within the broader floodplain above the drop into the narrower canyon (Figure 2).

**Figure 2. Dividing line (red) between Segments A and B**


Details of this site's current hydrologic, geologic, vegetative and biotic conditions are described in Chapter 3 of the EIS. The discussion below focuses on the river's free-flowing and water quality characteristics, and the Outstandingly Remarkable Values (ORVs) for which the Yankee Fork was found eligible.

#### *1.1.2.1 Free-Flowing Character*

Section 2(b) of the Wild and Scenic Rivers Act (P.L. 90-542) requires that all rivers considered eligible for designation need to be "free-flowing." Section 15 (b) of the Act defines a "free-flowing" river as one which is in a "natural condition" and without impoundment, diversion, rip-rapping, or other modifications of the waterway. It also states that existence of low dams, diversion works, and other minor structures shall not automatically bar its consideration, though such construction is discouraged.

In the Forest's 1989 Wild and Scenic Rivers Evaluation Report (USFS 1989), Segment A was evaluated to be free-flowing in a natural condition for its entire length and that it contained one bridge. The report, however, stated that segment B was in question as to whether it met the intent of 'free flowing in a natural condition' because of past dredging activities that re-routed the river and changed its width, depth, banks, and slope from its natural condition (see Figure 3).

Nonetheless, the presence of this compromising condition did not prevent the Forest from finding both segments of the Yankee Fork eligible for Wild and Scenic River status in the “Recreation” classification.  The “Recreation” classification allows for rivers that have undergone some impoundment or diversion in the past (16 USC §1273 (b) (3)).

**Figure 3.  Historical dredge tailing impacts in segment B compared to segment A**

#### *1.1.2.2 Water Quality*

The Yankee Fork of the Salmon River is one of the main tributaries to the Salmon River, with a watershed covering about 122,000 acres. The Yankee Fork flows approximately 28 miles to its confluence with the Salmon River near Sunbeam, Idaho. Upstream of the proposed facility, the Yankee Fork has experienced extensive habitat alteration due to historical dredging for gold and other metals (dredge operations ceased in 1952).

All waters of the State of Idaho are designated for beneficial uses that include agricultural and industrial water uses, wildlife, and aesthetics. The Yankee Fork is further designated for domestic water supply, cold-water biota, salmonid spawning, primary contact recreation, and special resource water. The Upper Salmon River Subbasin Assessment and TMDL (IDEQ 2003) indicated water quality impairment in waters from Jordan Creek to the Salmon River for sediment and habitat alteration. Sections of the Yankee Fork within the Salmon-Challis National Forest were listed for sediment. However, a TMDL for sediment was determined to not be warranted by IDEQ (IDEQ 2003).

Historical and present mining activities have formerly resulted in water quality impacts from selenium, mercury, cyanide, and other pollutants associated with mining in the drainage. However, there are presently no chemical contaminants, which exceed IDEQ water quality standards in the basin (Reclamation 2012).

## 1.2 Outstandingly Remarkable Values

According to the <u>Nationwide Rivers Inventory</u> (Table 1) both segments of the river share ***Recreation, Geology, Fish***, and ***History*** as their ORVS (Table 1) and that Segment A includes a ***Cultural*** ORV that Segment B does not share. The Nationwide Rivers Inventory includes the following summary statement for all three segments (A, B, and C):

> *"Native American religious and ceremonial fishery. Challenging white water for kayaking during high spring run-off. Spawning and rearing habitat for anadromous steelhead and Chinook Salmon." (NPS 1993).*

There is little discussion in the <u>Forest's 1989 eligibility determination</u> report to support the conclusions concerning the ORVs identified for the Yankee Fork. Each segment does, however, have a conclusory descriptive statement as recorded below:

> **Segment A:** *"Unique geologic features associated with the canyon and a diversity of recreation opportunities. The corridor provides unique and outstanding whitewater kayaking experiences during spring high flow."*

> **Segment B:** *"Significant historic and cultural values; the corridor contains numerous sites which are eligible for National Historic Register. However, this segment is located entirely on private patented mining lands and has been significantly modified due to past dredge mining. It is questionable whether it meets the intent of free flowing in a natural condition due to channel alteration. Segment does exhibit sufficient flow to sustain values. With both segments A and C determined eligible it is logical to include the middle segment. The segment tells a story of the early history of the area."*

There is a discrepancy concerning Outstandingly Remarkable Values between the National Rivers Inventory and the Forest's 1998 evaluation. The National Inventory lists five ORVs, but the Forest lists only two. The Forest concluded that Yankee Fork Segment A's ***Historical/ Cultural*** values were "not outstanding" and only its ***Recreation*** and ***Geology*** values were outstanding. The Forest concluded that Segment B's <u>ONLY</u> outstandingly remarkable feature was its ***Historical/ Cultural*** values. The differences are displayed in Table 2.

**Table 2. Difference between the National Rivers Inventory and the Challis National Forest's Assessment of ORVs**

| | Challis National Forest 1998 report | Nationwide Rivers Inventory |
|---|---|---|
| **Segment A** | Recreation and Geology | Recreation, Geology, Fish, History, Cultural |
| **Segment B** | Historical/Cultural | Recreation, Geology, Fish, History |

For the purposes of this assessment, a review of the effects of the Proposed Action on the Yankee Fork's eligibility for Wild and Scenic River designation will be conducted against the list of Segment A's ORVs in the Nationwide Rivers Inventory because it is the most inclusive list. This will result in assessing the effects of the Proposed Action against three ORVS the National Forest did not consider in 1998 to be 'outstanding' (***Fish, History,*** and ***Cultural***).

This review will assess the effects of the Proposed Action against current and relevant conditions identified in Segment A, but will also consider conditions in the lowest areas of Segment B since the segments share all but the ***Cultural*** ORV and the Proposed Action is very near the line dividing the two segments. Additionally, the river and landscape features of the Proposed Action's site are somewhat inconsistent with both Segments A and B. Segment A is a fast, narrow river flowing through a series of rapids down a comparatively steep, narrow canyon in a natural landscape. Segment B is a slow, wide, channeled river flowing through a heavily-altered 0.25-mile-wide floodplain in a landscape visually dominated by human uses and past impacts. The Proposed Action site is in the transition zone between these two conditions on a gently flowing river (no rapids) through a narrowing floodplain within a natural-appearing landscape. Assessment of the Proposed Action's effects on all relevant ORV conditions in both segments (where relevant) will more fully inform the deciding official concerning the scale, relevance, and context of the Proposed Action's effects.

### 1.2.1 Recreation

**Recreation in Segment A**

For Segment A, the Forest's 1989 report states that:

> *"Variety and diversity of recreation opportunities are similar to those found within the comparison area[6]. Motorized recreation opportunities exist. The corridor includes developed recreation sites.*
>
> *Segment provides a unique and unusual white water recreation opportunity for kayaking and floating during spring high water. Other activities include fishing and supporting activities"*

Those recreation opportunities remain today. Segment A provides recreation opportunities consistent with the "Roaded Natural" classification within the Forest Service's Recreation

[6] Multiple references to this "comparison area" are made throughout the 1998 evaluations but no description of the "comparison area" is given. The assumption made for this evaluation is that the "comparison area" is the Challis National Forest.

Opportunity Spectrum.[7] Camping, sightseeing, fishing and kayaking are the primary recreation attractions, though none of these are popular enough to attract visitors in great numbers from outside the region to this specific river segment. The Salmon River, downstream, is the much larger attraction.

The segment cannot be considered remote, being entirely within 3 miles of State Highway 75 and having passenger car vehicle access on the paved Yankee Fork Road along its entire length. Three developed, rustic (Figure 4), **campgrounds** (Pine Flat, Blind Creek and Flat Rock) are located along this road with ready access to the river. They provide a less-developed camping alternative to the more crowded and more developed recreational experience along the Salmon River downstream.

**Figure 4. Typical Campsite on the Yankee Fork segment A**

**Kayaking and rafting** is popular on this segment of Yankee Fork and is known for relatively short, fast, kayak runs (Figure 5).[8] Rafters are attracted to the class two and three rapids scattered along its entire length. Though used by local kayakers and rafters, this segment of the Yankee Fork is not popular enough to warrant much attention by guides for paying customers, likely because of its short run, narrow channel, and low flows in summer (the main tourist season). It is also reported to be prone to having large wood and debris creating hazards in the channel for river runners.

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[7] The Recreation Opportunity Spectrum is the framework the US Forest Service uses to describe recreational settings and desired recreation experiences (USFS 1979).

[8] Videos of kayaking this segment can be found at https://www.youtube.com/watch?v=hdimweGa7g8.

**Figure 5. Kayaking on the Yankee Fork segment A**

The installation of a temporary fish-trapping weir near Pine Flat campground created a barrier to rafters and kayakers on the river since the eligibility determination in 1989. Recreationists floating this section must now portage around the structure on the west bank, or begin their run below it. However, this weir is temporary and can be readily removed; and it is located at the upper end of the canyon, where kayakers and floaters are likely to start a trip down the canyon, rather than in the middle of a popular run.

**Fishing** is available the entire length of Segment A, though access to the river is limited at places by very steep banks. Fishing is very popular during salmon season on the Salmon River and up the Yankee Fork with the increase in numbers of returning steelhead and Chinook salmon. Fishing can be a peaceful and comparatively solitary experience in this area most other times of the year.

**Recreation in Segment B:**

For Segment B, the Forest's 1989 report states that:

> "*Recreation opportunities within this corridor are limited due to heavy modification of the corridor from dredge mining opportunities and private land. Motorized access is permitted. Conflicts between recreation activities and mining opportunities exist. Old historic dredge does provide a recreation opportunity for interpretation.*"
>
> "*Water oriented recreation opportunities are also limited due to heavy modification of the stream* channel from mining. Size of stream tends to limit amount and diversity of activities."

This segment is nearly all private land, so public recreation opportunities are few and the attractions are limited to those created by business or other interests.

The river holds comparatively little recreation attraction in this segment since access and river condition (slow, wide, and shallow, with limited vegetative cover) is compromised by the dredge spoils. One fishing attraction, however, is the popular trout fishing in the remnant ponds created by these dredge spoils.

Very little has changed concerning the recreation opportunities available in Segments A or B between 1989 and the present (2016). As stated in 1989, this segment's inclusion was based on historic values (primarily from the gold mining days), and the fact that it is between two river segments (A and C) that are more consistent with Wild and Scenic River consideration.

### 1.2.2 Geology

The Forest describes geology in the Yankee Fork as follows:

> Segment A: *"Geologic features are unique and scenic. Steep rocky and narrow canyon is not common to the comparison area."*
>
> Segment B: *"Geologic features are similar to those commonly found within the comparison area."*

The summaries of geologic characteristics above simply conclude that Segment A is in a steep rocky narrow canyon and Segment B is in a gentle floodplain, and that the canyon features are less common across the National Forest than is the floodplain from a river visitor's perspective (Figure 6). The Proposed Action is located in a transition area from floodplain to narrow canyon and offers views of canyons downstream and views of a broader flatter floodplain when looking upstream. These geologic features are described in technical detail in Chapter 3 of the EIS.

**Figure 6. Geologic formations along canyon wall in Yankee Fork segment A**

In these river segments, the geologic features are valued for the scenic value, rather than for providing any recreation experience or economic values based on them such as rock climbing, rock/gem collecting, mining, etc. The scenic values of these features have not been changed by human activity (other than fire-related scenic changes) since they were recognized in 1989.

### 1.2.3 Fish

The Forest describes the Geology ORV in the Yankee Fork as follows:

Segment A: *"Segment supports fair fish populations of resident and anadromous fish species. Fishery is fair throughout the corridor. Steep stream gradient limits fishing success. Opportunities are similar to those found within the comparison area. Access to water's edge is difficult in some locations due to steep banks."*

Segment B: "*Segment supports fair fish populations of resident and anadromous fish species. Fishery is fair throughout the corridor. Tailing ponds are being used as fish rearing ponds. Opportunities are similar to those found within the comparison area. Tailing ponds are also being stocked and provide high fishing success. Tailing ponds provide high fishing success. Tailing pond provides better fishing opportunities than main channel due to past mining impacts.*"

Fish populations and recovery activities for ESA-listed species are fully described in Chapter 3 of the EIS. A significant amount of recovery effort has been applied to restore salmon runs to the Yankee Fork since the recognition of these river segments in 1989. As such, the ***Fish*** ORV for these river segments is significant, and actions that enhance or support this ORV are desired. The sole purpose of this project is for just such restoration.

### 1.2.4 History

The Forest describes the History ORV in the Yankee Fork as follows:

Segment A: "*Cultural resource sites of less importance and significance are present within the corridor*."

Segment B: "*Significant and unique historical/cultural resource sites exist within the corridor. Bonanza town site, Native American village sites, cemetery, Bonanza Guard Station, CCC Camp, and dredge are all eligible for the National Historic Register. Unique interpretive opportunities*"

The values for this ORV were recognized primarily in Segment B, with the many features and structures potentially eligible for listing in the National Register of Historic Places. At the project site, the nearby historical suction dredge tailings, and two historical road segments (the historic Stanley to Bonanza Wagon Road and the Custer Motorway Adventure Road segment) are the features of consideration (see EIS, Chapter 3). These features were not mentioned in the 1989 descriptions, which focused on buildings; town and village sites; and other features distant from this Proposed Action. There has been no measurable change to the historical features mentioned in the 1989 document; their value endures in Segment B.

### 1.2.5 Cultural

The Forest provides no description for the Cultural ORV in the Yankee Fork for either Segments A or B other that its quick reference under 'History,' above. They were, however, included in the list of ORVs for Segment A in the National Rivers Inventory.

The Forest's focus on ***Cultural*** values for segment B in the 1989 eligibility determination was limited to physical features such as "Native American Village sites" (see 'History,' above). There is no mention of Native American cultural values associated with the land or the fish, apart from places they occupied or archeological artifacts they left behind. There is no detailed information in the National Rivers Inventory about which cultural values are to be considered for Segment A beyond their summary statement, which mentions "*religious and ceremonial fishery.*"

For the purposes of this assessment, both the sites in Segment B and the Tribes' cultural values associated with traditions tied to traditional fish harvesting (applicable to Segment A) will be considered.

## 1.3 Existing Facilities

Subsequent to the 1998 evaluation, the Forest authorized the Tribes to install and operate a temporary weir at Pole Flat Campground within Segment A for trapping fish for population restoration purposes. See Figure 2 for location and Figure 7 for close-up detail. As can be seen clearly in Figure 7, the weir extends the entire width of the river, interrupting its free flowing characteristics. It does not, however, impound water, divert flow, straighten or narrow the channel. Though it appears to compromise the free-flowing nature of the Yankee Fork, this weir is temporary and can be readily removed with no major disturbance to the river's bed or banks. Because it is temporary, it does not constitute a feature that eliminates this river's continued eligibility for potential future designation as a Wild and Scenic River.

**Figure 7. Existing weir on Yankee Fork**

Along with the existing temporary weir, the Tribes use other two other structures to monitor fish movement along Yankee Fork. These include a rotary screw trap and a passive integrated transponder (PIT) tag array. The rotary screw trap is located downstream of the Pole Flat weir, and is used to monitor and enumerate juvenile spring Chinook and steelhead. The PIT tag array is located in Yankee Fork, approximately 2 miles upstream of the Salmon River, and is used to detect and identify fish marked with PIT tags. Both structures provide the Tribes with information about the use of Yankee Fork by anadromous and resident fish. The screw trap and PIT tag array would continue to be used as part of the Proposed Action.

# 2 Proposed Action

The proposed weir on Yankee Fork is part of the larger Crystal Springs Hatchery Program, which includes a new fish hatchery near Springfield, Idaho, and two fish trapping weirs: Panther Creek and Yankee Fork. While this program achieves an array of purposes for differing federal agencies and the Tribes (see EIS, Chapter 2), its fundamental function is to support the recovery of ESA-listed Snake River spring/summer Chinook salmon. The description of facilities below will focus only on those associated with the weir in Yankee Fork. The Crystal Springs hatchery and the weir on Panther Creek are far removed from Yankee Fork and have no impact on its Wild and Scenic River values.

## 2.1 Purpose and Need

The purposes of the Yankee Fork weir is to catch, hold and spawn, adult Chinook salmon to obtain eggs and milt for the hatchery; manage returning adult Chinook salmon; and monitor program success in meeting production and adult return numbers. The need is to contribute to the recovery of the Snake River spring/summer Chinook salmon Evolutionarily Significant Unit.

Yankee Fork, though eligible for designation as a Wild and Scenic River, was selected as the location for this weir and associated Chinook salmon restoration actions because of the historical use of this watershed by this species, and their near extirpation from it.

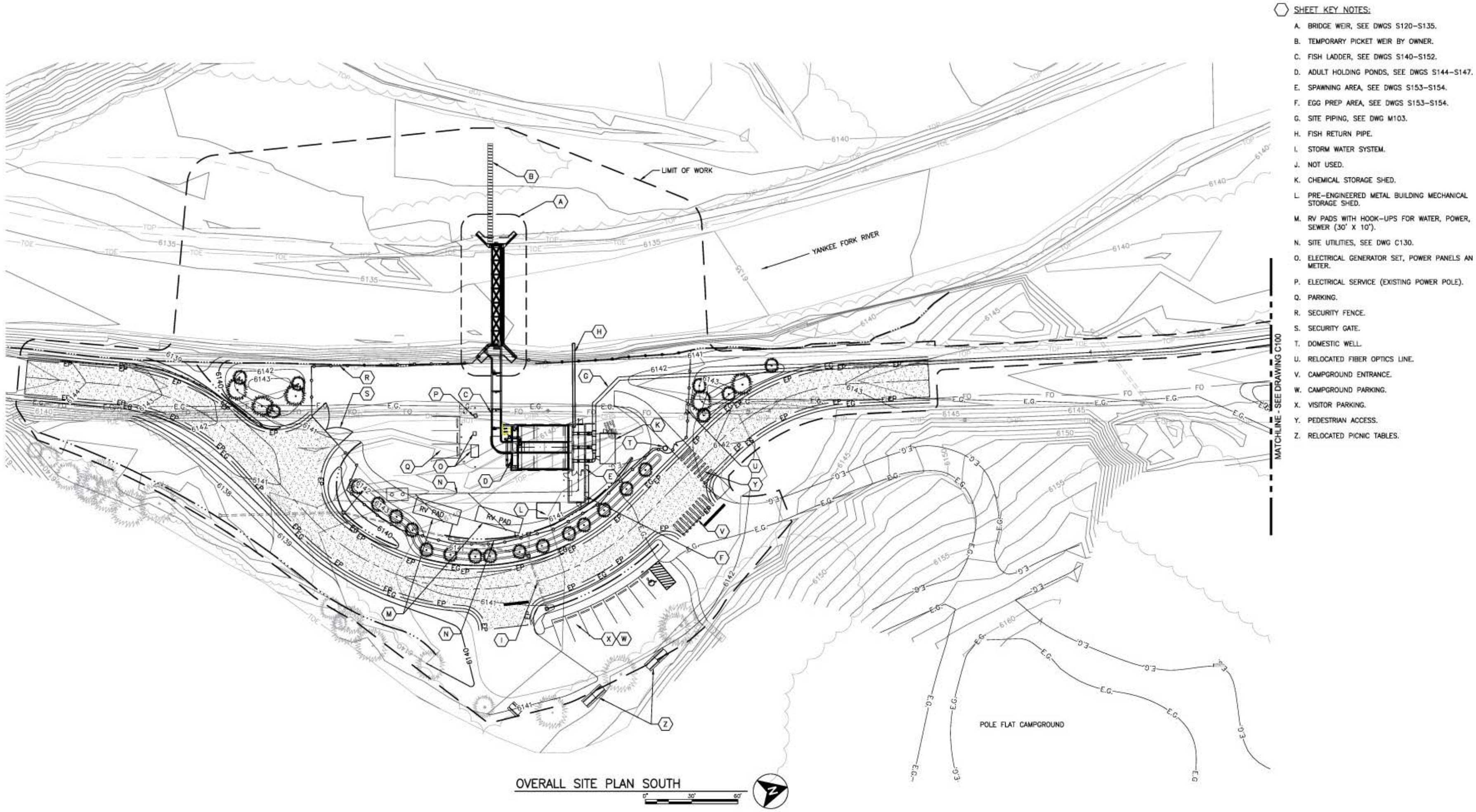
## 2.2 Construction Components

Under the Proposed Action, a new permanent fish trapping weir and fish holding and spawning and juvenile fish acclimation facilities would be built at the Yankee Fork location. The weir site on the Yankee Fork would be on USFS-managed land at Pole Flat Campground (Figure 2). The Tribes currently use this location and set up a temporary weir and a temporary field station on opposite sides of the heavily used Yankee Fork Road. At the weir site, the road is immediately adjacent and parallel to the top of the left bank (east bank) of the Yankee Fork. The existing onshore work area for the weir (fish handling area) is on the opposite side of the road from the weir. The proposed facilities would include the weir, adult fish holding and handling facilities, juvenile acclimation facilities and crew and equipment accommodations (Figure 9). Eggs would be transported from the Yankee Fork weir facility to the Crystal Springs hatchery for hatching and rearing. Once the Chinook salmon are ready for release, they would be transported by truck back to the Yankee Fork weir facility for acclimation and release.

Along with the existing temporary weir, the Tribes use other two other structures to monitor fish movement along Yankee Fork. These include a floating, portable, rotary screw trap (exemplified in Figure 8) and a PIT tag array. The rotary screw trap is located downstream of the Pole Flat weir, and is used to monitor and enumerate juvenile spring Chinook and steelhead. The PIT tag array is located in Yankee Fork, approximately 2 miles upstream of the Salmon River, and is used to detect and identify fish marked with PIT tags. Both structures provide the Tribes with information about the use of Yankee Fork by anadromous and resident fish. The screw trap and PIT tag array would continue to be used as part of the Proposed Action.

**Figure 8.  Example of a rotary screw trap**

**Figure 9. Yankee Fork weir facility components**



- **Bridge Weir.** A new 65-foot long bridge weir (as exemplified in Figure 10) is proposed to be located a short distance downstream of the existing temporary weir site in order to locate the ladder entrance at a more defined stream bottom near the left bank of Yankee Fork. This weir would allow water to flow through a set of pickets, but would limit fish passage directing them toward the fish ladder leading to holding tanks. Tribal operators may need to deploy a temporary picket weir to extend the weir on the right bank to seal off fish passage.[9] Within the creek, the weir would be based on U-shaped pre-cast concrete sections excavated approximately 7 feet into the stream bottom, which would be backfilled with cobbles and gravel and support an 8-foot-wide flat segment of concrete (the sill). Gates to control stream flow elevations would be mounted onto the sill at the streambed elevation up to the walkway. The bridge portion of the weir would be steel construction, spanning the width of the creek. Rotating picket panels would attach to the upstream edge of the bridge and drop into place to seal against the concrete sill. Chain link fences and gates would be used to prevent public access to the bridge structure, and signage would be provided to indicate a portage around the right abutment for watercraft floating the river.

**Figure 10. Example of a bridge weir in operation**

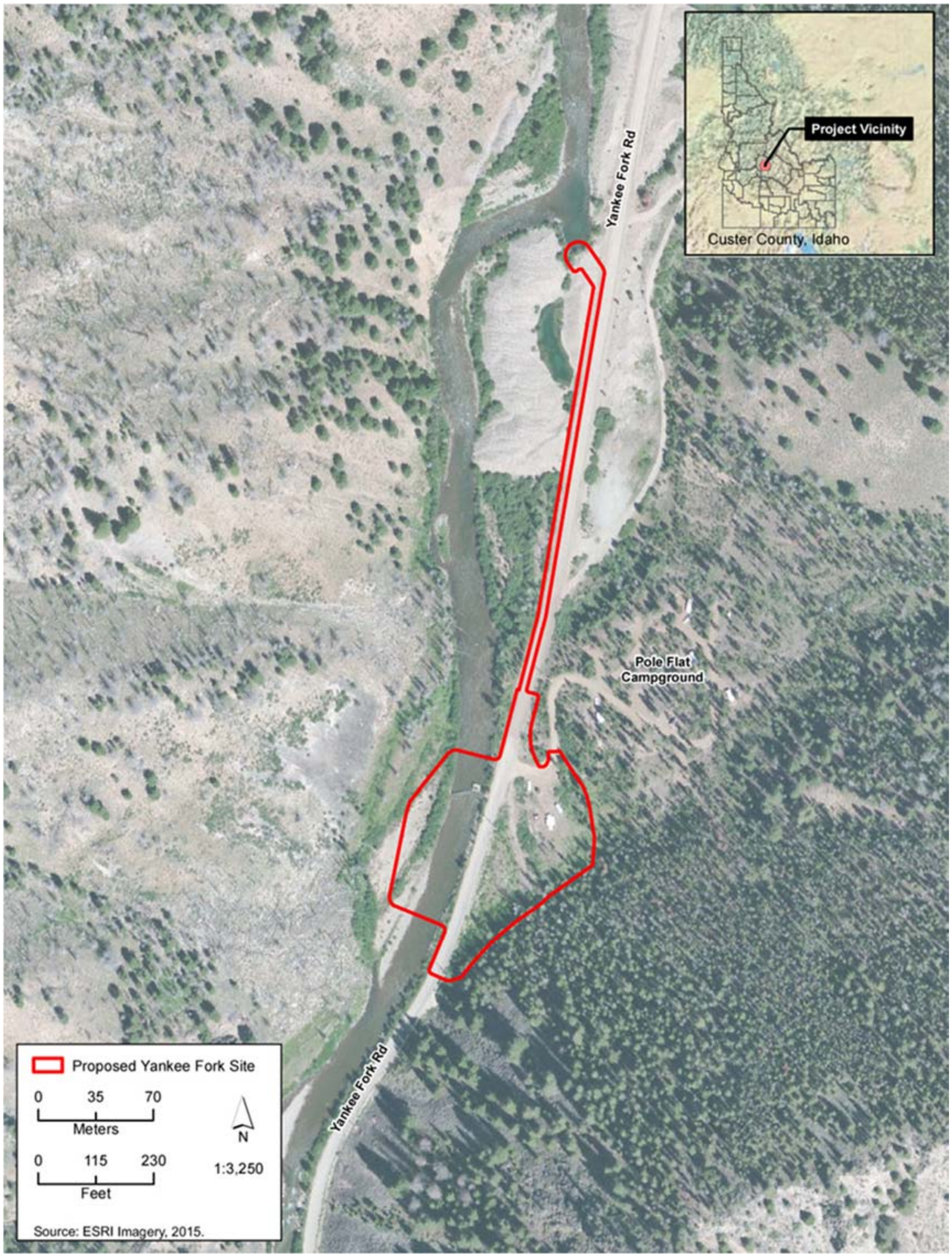
[9] Deployment of this temporary picket weir would be limited to high flow events (when the Yankee Fork overtops its bank) during the early June Chinook trapping season. It is anticipated that this would be an extremely rare occurrence and is included in the design in the event of an unusual water year.

- **Jib Crane.** A jib crane is a permanent crane that would be installed adjacent to the bridge weir and used to remove debris from the weir and possibly for lifting fish for transfer to transport trucks or from a live box to the holding pools if the fish ladder is not effective at attracting fish at certain times (e.g. during low flow).
- **Fish Ladder.** The weir's panels are designed to guide fish to a 2-foot by 3-foot ladder entrance built into a precast concrete weir abutment. A vertical bar gate would control access into the fish ladder. A canal gate would also be installed to control water flow and completely isolate the ladder from the river for maintenance purposes. The five ladder pools average 12 feet long, 5 feet wide, and 5 feet deep and travel the required distance and elevation to the pre-sort holding pond. It is designed for 10 cfs flows over a range of creek elevations from 6,139 to 6,135 feet above mean sea level.
- **Adult Holding Ponds**. Three holding ponds for the collected adult salmon would be constructed adjacent to the weir on the east bank of the Yankee Fork. The ponds would be made of reinforced concrete walls and slabs. The pre-sort pond would be 6 feet wide and would be dedicated to holding adult fish prior to sorting. After sorting, fish would be placed in one of the two post-sort holding ponds. Pass-through gates would be provided in the pre-sort pool walls to minimize the amount of lifting required to move fish for the pre-sort to post-sort pools.
- **Egg Collection and Preparation Structures**. Adjacent to the three adult fish holding ponds, a three-sided structure would be built for collecting, fertilizing, and disinfecting eggs from the adult fish and a fully enclosed metal-sided one-story structure would be built for temporary egg storage prior to transport.
- **Chemical Storage**. A 10 foot by 20 foot pre-fabricated chemical storage building with built-in spill containment and explosion-proof construction would be installed adjacent to the fish holding ponds (to the north) to hold formalin (used for adult salmon treatments during holding and sorting) and iodophor (used to disinfect fertilized eggs for transport to the hatchery). The chemical storage shed would hold eight 55-gallon barrels of formalin and 5 liters of iodophor as well as the pumping and distribution piping. At the end of each season, the storage container would be removed and inspected prior to deploying it the next season.
- **Hopper Structure**. A fish hopper is a holding box and piping structure that aids in the transfer of fish from one holding pond to another. The hopper would measure approximately 6 foot by 6 foot.
- **Collection Facilities.** At the Yankee Fork adult collection facilities, sorting and processing activities would primarily take place in the spawning area. The egg preparation building would be utilized to store the eggs after spawning, along with egg transportation equipment. Both facilities would be located adjacent to the upstream end of the pre-sort and post-sort holding ponds.
- **RV Pads**. Two 30 foot by 10 foot areas would be graded and graveled to be able to park 2 RVs that would house employees during the adult trapping season. Human waste would be collected in a holding tank and would be pumped out as needed (disposed of offsite at an RV septic service or through a disposal service used by the USFS to service the Pole Flat Campground).
- **Water Source**. Water would be supplied through an intake structure in Yankee Fork. The water would flow through the facility back to the river without loss. The distance between the intake and the discharge through the fish ladder is approximately 1,260 feet.

It is anticipated that the water required for the facility would be 10 cfs, approximately less than 5% of average stream flow. Potable water for the RV units would be provided by a small domestic well. If approved for construction, the Tribes would apply for a non-consumptive water right from the Idaho Department of Water Resources to operate the Yankee Fork weir facility.

- **Water Intake**. A gravity flow intake for the collection facility water supply would be located approximately 1,100 feet upstream of the facility site (Figure 11). The proposed intake screen would be a self-cleaning cone screen installed in a pre-cast concrete structure built into the stream bank in order to protect the screen from vandalism and to provide maintenance access. A 24-inch supply pipeline would route water from the intake screen to the facility along the west side of Yankee Fork Road. The pipeline would discharge into the holding tank diffusers. The water would pass through the holding pools and ultimately collect into the fish ladder. The water would discharge back to Yankee Fork through the ladder entrance.
- **Juvenile Acclimation.** Juvenile salmon would be acclimated in **e**xisting off-channel ponds located about 0.25 miles upstream of Pole Flat Campground. These ponds would receive juvenile fish trucked in from the hatchery for short-term acclimation and stress relief prior to release into Yankee Fork. The Yankee Fork ponds would provide for short-term holding of at least 165,000 fish at 10 fish per pound.
- **Yankee Fork Road Realignment.** About 425 feet of the existing paved road would be removed and a new 675-foot section of road would be constructed to the east and curved to circumvent the weir site. The road would consist of the same look and materials as the existing road section and would include landscaping berms and signage to increase the safety of the road features and minimize visual effects. It would provide three new access points to the lands adjacent to the road; one would access the facility, one would access a new public parking area for visitors to the facility, and one would provide a new entrance to Pole Flat campground, adjacent to the facility site. Once the new section of road was completed, the traffic would be rerouted to the new section, and the old road section would be converted to use for the Yankee Fork weir facilities (most of the road would be removed; some portions would remain for facility use). The speed limit for the new, curved section of road would be set at 20 miles per hour. The realignment would be designed to provide a safe work environment by routing through-traffic around the trapping facility and the holding ponds. The design would meet state highway standards and appropriate code requirements for horizontal and vertical curves, sight distances, and roadway design.

**Figure 11. Proposed weir site on Yankee Fork showing upstream water intake location**



## 2.3 General Impact Minimization Measures

Mitigation measures to be applied during construction and operation of this weir facility, as well as the hatchery and facility on Panther Creek, are listed in Chapter 2 of the EIS. The list is detailed and lengthy and contains numerous requirements for

- prevention of water pollution, air pollution, and soil contamination;
- public safety;
- contouring and revegetation of disturbed sites following construction;
- invasive weed protections;
- control of erosion, sedimentation, and dust;
- protections for fish, wildlife, and their habitat during construction;
- protection of wetlands and floodplain functions;
- protection of cultural resources;
- design features and color requirements for compatibility with natural environment;
- minimization of noise and light pollution; and
- safe chemical handling.

Many of the measures apply to all three features of the larger project and while many have direct bearing on the effects of the Yankee Fork weir facility on Wild and Scenic River values, many do not. The measures below, however, are specific to the weir in Yankee Fork. They relate to public safety; and design criteria and construction requirements to protect the banks and bed of the river from erosion damage during high flows at key structural points.

- Minimize disruption and adverse impacts on the customary users of the Pole Flat Campground and picnic area near Yankee Fork weir facility using several strategies:
    - Coordinating with USFS staff to ensure access to the campground is maintained for as much time as possible. If facilities are temporarily or permanently relocated, signage for new or alternate facilities should be clearly posted.
    - Coordinating with USFS staff to schedule construction activities to coincide with lower-use periods during the recreational season (e.g., on weekdays, or during less favorable fishing conditions).
    - Coordinating with USFS staff to minimize noise and visual disruption to recreational users by efficiently scheduling construction activities and staging work areas away from recreational areas to the greatest extent possible.
    - Coordinating with USFS staff to provide signage, warning boaters on the Yankee Fork of the presence and seasonal use of the weir structure.
- Return all non-target species entering the fish ladder to the Yankee Fork upstream of the weir.
- Avoid clearing vegetation prior to the spring bird-nesting season (April 1 to July 15).
- Erect temporary fencing around areas that are not to be disturbed to protect them during construction.
- Develop and implement a plan to revegetate temporarily disturbed areas to provide wildlife habitats and reduce the risk of weed encroachment.
- Minimize lighting and use lighting fixtures that direct light downward and not towards off-site areas.
- Develop and implement a plan to manage predatory wildlife attracted to the facility
- Install fish screens at water intake structures to minimize entrainment of aquatic species.
- Prior to distributing carcasses of spawned adults, develop a plan to avoid human/wildlife conflicts.

# 3 Effects of the Proposed Action on Yankee Fork

The Proposed Action is to construct a permanent weir across the Yankee Fork with adult fish handling facilities and crew and equipment accommodations. These would all be constructed between a relocated Yankee Fork Road and the river immediately downstream of Pole Flat campground. This construction would introduce the following features into this river and its corridor.

- A permanent 65-foot river-spanning weir with concrete abutments into the banks and a slab along the streambed. The weir would have a steel footbridge across the top. The weir will include gates to allow for control of stream flow elevations. A portage will be provided around the weir on the west bank of the river for boaters' use.
- A concrete fish ladder 5 feet wide and 60 feet long would run from the weir up the east bank to a series of three contiguous aboveground, 5 feet deep, concrete holding and sorting ponds measuring approximately 30 feet by 40 feet altogether.
- A collection of metal-sided structures for egg collection (three-sided), egg preparation(10 feet by 20 feet one-story), chemical storage (10 feet by 20 feet one story),
- Two 30 foot by 10-foot recreational vehicle pads, visitor parking, vegetative screening, and chain link fencing surrounding the entire facility to prevent unauthorized access.

Yankee Fork Road would be realigned up to 30 feet to the east to provide the necessary space between the river and the road to accommodate this 120 foot by 240 foot (approximately 2/3 acre) facility.

The acclimation ponds are located approximately 0.5 mile upstream from the trapping facility, well within Segment B. These ponds, however, are separated from the river and across from Yankee Fork Road, though connected downstream by a small stream. There will be no modification of these ponds or any construction of facilities. Fish pens will be used to contain fish for a period in the spring then opened for fish to make their own way to the river.

## 3.1 Alteration of Within-Channel Attributes of Yankee Fork

### 3.1.1 Position of Proposed Activity

The Yankee Fork weir will require construction activities within, and temporary and permanent modifications to, Yankee Fork's banks and bed in a number of locations.

<u>Temporary impacts</u> on Yankee Fork's channel would include the

- diversion channel for rerouting Yankee Fork during construction of the bridge-supported weir/fish ladder, acclimation pond outfall, and upstream intake structure
- construction activities for the upland structures: the spawning and egg preparation structure, chemical storage shed, RV pads, water intake and pipeline, and road relocation

<u>Permanent modifications</u> to the Yankee Fork channel would include the excavation of the streambed and both banks to install the pre-cast concrete sill, bridge-supported weir abutments, and fish ladder.

### 3.1.1 Anticipated Effects to Channel Location, Slope, Geometry, Form

Though the Proposed Action will temporarily reroute and dewater Yankee Fork during the construction period, the only permanent alterations to the Yankee Fork's channel are the minor changes associated with the weir's abutments, sill, and water intake. These structures consist of two "V"-shaped concrete structures on each bank connected by a 10-foot-wide concrete "floor" (the sill) across the riverbed. These structures may create minor flow alterations immediately around them they are not anticipated to make, or create any significant alteration to the Yankee Fork's channel.

The buildings on the uplands adjacent to Yankee Fork would be constructed on a generally flat terrace landform and will not affect the channel.

The concrete abutments and sill forming the foundation of the proposed bridge weir have the potential to create flow obstructions and hydraulic conditions that promote bed sediment scour at the weir. If the bed scours deep enough it could lead to undermining and destabilization of the weir structure. Project design measures would be used to minimize risk of seismic impacts, soil settlement and depletion, and channel scour to negligible levels. Therefore, the likelihood of the weir affecting the Yankee Fork channel's location, slope, geometry or form is very low.

**Figure 12. Example of permanent weir with abutments visible**


### 3.1.2 Water Quality

**Water Quality Effects from Facility Construction**

There will be short term and temporary impacts on Yankee Fork's water quality during the construction of the facility. Construction of the upland facilities and road realignment could result in runoff from the construction site to the Yankee Fork. A National Pollutant Discharge Elimination System (NPDES) permit, erosion and sediment control plan, and Spill Prevention Control and Countermeasure (SPCC) plan for all construction activities would be obtained prior to ground-disturbing activities and implemented during construction to prevent or minimize this effect.

Several factors would minimize the potential for water quality impacts during construction: the proposed adult holding and spawning facilities at Yankee Fork lie on relatively flat ground, 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. In general, a sediment and erosion control plan and hazardous material spill prevention and containment plan would be prepared and implemented. Silt fencing would be installed along the perimeter of the construction site; stockpiled excavated materials would be protected from water or wind erosion by covering where appropriate; and any surface water (rain) would be detained on site and filtered before discharge. The water intake, weir, and fish ladder within the Yankee Fork would be installed during the dry season within the approved in-water work window to protect listed salmonids; the site would be dewatered during installation; only precast concrete would be used; and turbidity curtains would be used to minimize the potential for sediment introductions to surface waters from the installation of in-stream structures. A number of additional BMPs would be required for the in-channel work, including that all equipment operating within the dewatered channel would be washed and dried and inspected regularly to ensure that it is properly functioning and leak-free. All cleaning and refueling activities would occur at least 300 feet from surface waters to minimize the potential for wash water and fuels to enter the Yankee Fork.

The weir and fish ladder would be constructed in three phases. During Phase 1, a lined diversion channel would be constructed on the west bank of the Yankee Fork to facilitate the diversion of water around the weir/fish ladder construction site. During Phase 2, the diversion channel would be breached, coffer dams made with plastic lined soil sacks (sand bags filled with clean native material) would be installed at the upstream and downstream ends of the diversion channel to facilitate the diversion of water into and out of the channel and provide a dewatered construction area for the weir and fish ladder. Further, a turbidity curtain would be installed below the downstream cofferdam. During Phase 3, the cofferdams would be slowly removed to return flow through the construction site, and the diversion channel would be filled and restored to preconstruction conditions.

Because of these conditions and implementation of mitigation measures and BMPs, the potential for temporary impacts on surface water quality from construction of the Yankee Fork weir facilities would be low.

**Water Quality Effects from Facility Operation**

The weir would be operational from June through August. Chinook salmon would be collected at the weir, moved to holding ponds, and held there until they are ready for spawning through September and October. From June through October, approximately 10 cfs of water would be diverted from the intake in the Yankee Fork through the holding facilities and back to the Yankee Fork through the fish ladder. This operation does not include fish feeding, only holding of the adults for spawning; thus, organic solids associated with feed would not be discharged to the Yankee Fork.

During this holding period it is possible that adult fish may need to be treated with formalin in the event of thermal stress during holding or an observable outbreak of infections in the holding ponds. Any such treatments would be prescribed at doses consistent with use of therapeutic chemicals within hatcheries as regulated under EPA's *Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category* (EPA 2004), which establishes limitations for aquaculture chemicals. In addition, the handling, application, and disposal of formalin would adhere to U.S. Department of Agriculture and U.S. Food and Drug Administration Center for Veterinary Medicine regulations and other state and federal regulations to protect human and environmental health.

If on-site staff determines there is a concern of pathogen infections to fish being held at the facility, and formalin treatment is considered necessary for fish health, then water flow through the ponds and fish ladder would be turned off to prevent discharge into Yankee Fork while treatment measures are applied. Following treatment and confirmation that all three ponds and the fish ladder are free of formalin, the weir operator would restore water flow through the ponds and re-open access to the fish ladder so upstream fish passage could resume. Following these protocols and accepted standard practices by appropriately trained staff, treatment applications would be applied only when necessary, at dosages not harmful to fish or other biota, and of short duration. Therefore, the potential impacts of formalin treatment on the Yankee Fork water quality would be **low**.

The potential effects on water quality from acclimation activities in the Yankee Fork are expected to be low. Acclimation of Chinook salmon smolts would occur in batches in existing off-channel ponds upstream of the facility in the spring (April through June). Though there may be organic solids (i.e., feces) produced in the pond due to smolts feeding on native prey, these fish would not be fed thus minimizing such impacts on Yankee Fork. No therapeutic chemicals would be used during acclimation.

### 3.1.3 Navigation of Yankee Fork

This facility would prevent passage by recreational rafters and kayakers. These river users would have to take out and portage their gear approximately 300 feet around the facility. The location of this facility is at a logical put-in or take-out on the east bank, and a portage route around the west bank of the facility is available. When flows are adequate, short segments of Yankee Fork (of which this in not one) are used for advanced kayaking.

There would be low to no impact on navigation by recreation users.

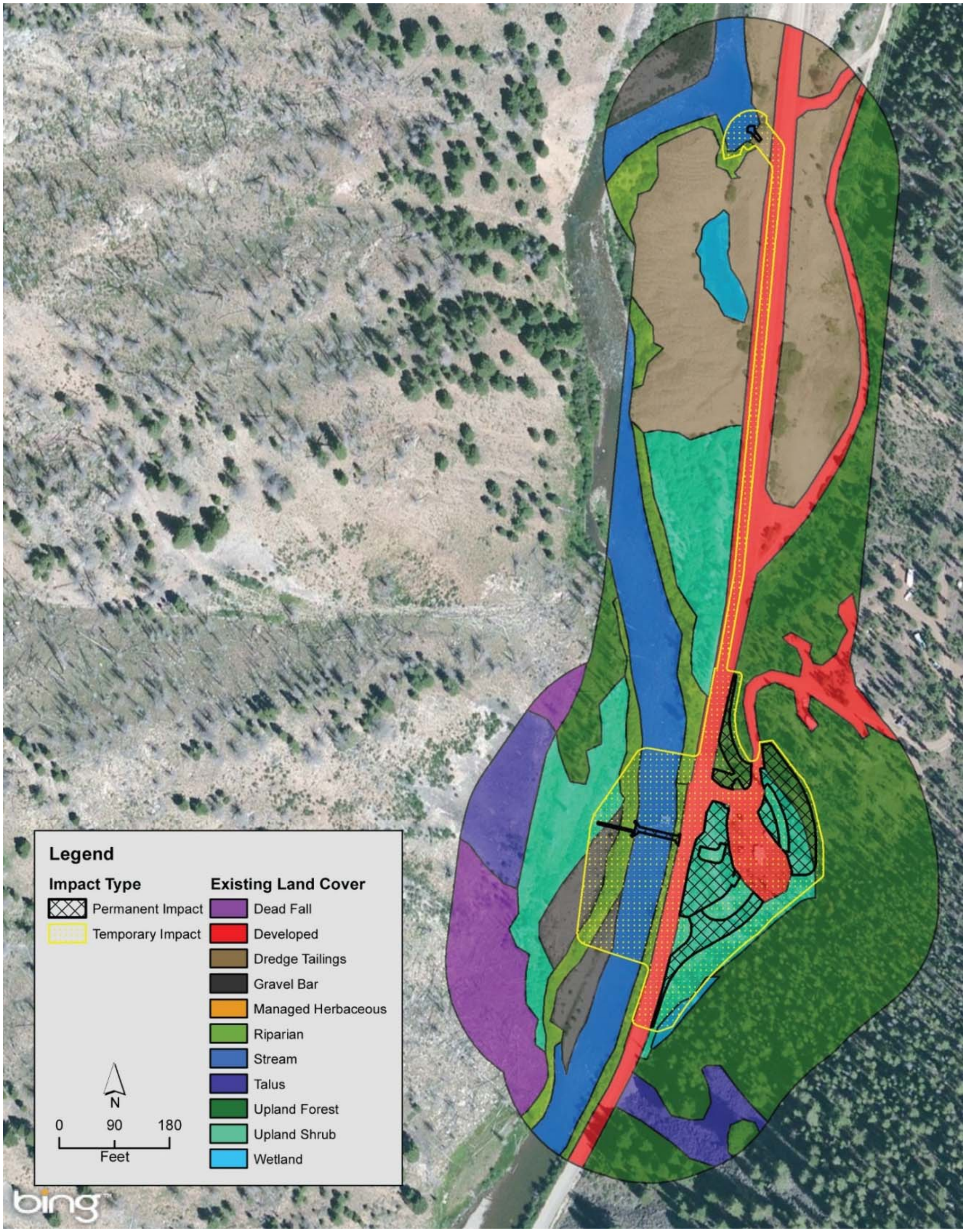
## 3.2 Alteration of Riparian and/or Floodplain Conditions

### 3.2.1 Riparian Vegetation

The Yankee Fork weir facility site has been previously disturbed by gold mining activities, road construction, and the development of adjacent recreational facilities (e.g., campgrounds) thus only narrow riparian areas are now present along the banks of the Yankee Fork. Figure 13 demonstrates the limited extent of riparian vegetation within the project area. The riparian cover type occurs along both sides of Yankee Fork. On the east bank, riparian areas are present in a narrow strip between the channel and Yankee Fork Road and at the northern tip of the site. On the right (west) bank, riparian areas occur along an exposed gravel bar. Dominant vegetation in this cover type is mountain alder, with Geyer's willow, other willows, twinberry, swamp birch, bluebunch wheatgrass, and other grasses also common. Several young lodgepole pine saplings and a few larger trees are also present along the left (east) bank. Overall, the riparian cover type occupies 1.31 acres (6%) of the Yankee Fork weir facility site.

The new facility would remove approximately 10 square feet of wetland vegetation and impact approximately 60 feet of streambank by installation of the abutments. These small amounts are of very little effect to stream function, floodplain function, fish and wildlife habitat, scenic and recreation values, etc. Only 0.01 acres of riparian habitat (total for the entire facility) would be permanently disturbed.

**Figure 13. Existing cover types with permanent and temporary impact locations identified**



### 3.2.2 Soil Properties

Construction of the new site facilities would result in conversion of existing soil surfaces into human-made surfaces that would result in the loss of soil resources. Most of the conversion would be due to the construction of gravel surfaces for the day-use area, RV pad, and staging area around the proposed bridge weir and adult holding and spawning facilities. Additional conversion would be due to concrete poured for a road through the site. About 425 feet of the existing Yankee Fork Road would be removed and a new 675-foot section of road would be constructed to the east and curved to circumvent the weir site. Concrete would also be used for foundations for other smaller facilities, such as the holding ponds and the weir.

Soil erosion could occur at the Yankee Fork site on fresh cut ground or areas where hydrologic runoff patterns are altered due to grading and new site infrastructure (e.g., channelized flow, slope over-steepening) that would result in the loss of soil resources. The potential for soil erosion is considered low due to the generally flat topography at the site and the coarse alluvium that makes up the terrace where construction would occur. Upon completion of construction, the primary source of stormwater runoff concentration that could cause soil erosion in the long-term would likely be created by realigning and lengthening the new concrete road proposed for the site, since this would create additional impervious area at the site. Impacts from the construction of the Yankee Fork weir facility on geology and soils would be low.

### 3.2.3 Floodplain Properties

Although there are no FEMA-mapped floodplains on the Yankee Fork weir facility site (FEMA 1988), the 100-year floodplain was determined for the middle and lower Yankee Fork by Reclamation during a 2012 tributary assessment using 1-meter LiDAR data modeling at the geomorphic reach level. Based on this assessment, Reclamation determined that the historic floodplain along much of Yankee Fork is disconnected from the channel by dredge tailings (Reclamation 2012). As such, the current floodplain is largely confined to the channel. The present channel is similar to the pre-dredging condition, when the channel was moderately confined by higher surfaces, alluvial fans, and bedrock into a relatively straight, free-formed alluvial channel.

The proposed temporary bypass channel, portions of the bridge-supported weir abutments, and the intake structure would be located within the 100-year floodplain of Yankee Fork. Construction of these features would require the excavation of native material from these areas and the placement of rock backfill, concrete, and other materials (e.g., plastic liner). Material removed from the excavation of the bypass channel would be temporarily stockpiled in the floodplain. This would occur during the summer, when flood risks are minimal. Following construction, the diversion channel would be re-filled with this material and re-vegetated with native plants. The other features would remain as permanent structures in the floodplain, resulting in a total floodplain impact of 668 square feet (0.015 acres). These temporary and permanent impacts would not result in significant changes to floodplain capacity nor would they alter flood flows. With mitigation, impacts on the Yankee Fork floodplain would be low. Due to the low risk of flooding during construction, the implementation of mitigation measures during construction activities, and the minimal area of permanent structures in the floodplain relative to the size of the floodplain, impacts would be low.

## 3.3 Alteration of Upland Conditions

The Yankee Fork weir facility site has been previously disturbed by gold mining activities, road construction, and the development of adjacent recreational facilities (e.g., campgrounds).

Vegetated areas within the site include narrow riparian areas along the banks of the Yankee Fork; upland and wetland shrubland located along the east side of Yankee Fork Road and around the current worksite; and upland forested areas located near the Pole Flat Campground entrance and on the steeper slopes to the east. Un-vegetated areas within the site include exposed gravel bars, areas of dredge tailings, the Yankee Fork channel, and existing roads and parking areas. Surrounding land cover includes forested areas and talus on the surrounding slopes to the east and west, including a previously burned area on the west side of the channel that contains a considerable number of standing snags and downed woody debris.

Vegetative cover types and the impacts of project activities are displayed in Figure 13 (above) and enumerated in

**Table 3. Construction impacts on vegetation cover types**

| Vegetation Cover Type | Total Area in Site (Acres) | Total Impacts (Acres) | Temporary Impacts (Acres) | Permanent Impacts (Acres) |
|---|---|---|---|---|
| Riparian | 1.31 | 0.33 | 0.33 | 0.01 |
| Wetland Scrub-Shrub | 0.19 | 0.02 | 0.02 | 0 |
| Upland Shrub | 2.66 | 0.92 | 0.31 | 0.62 |
| Upland Forest | 6.27 | 0.30 | 0.08 | 0.21 |
| Dead Fall | 1.04 | 0 | 0 | 0 |
| Stream | 2.30 | 0.53 | 0.51 | 0.02 |
| Gravel Bar | 0.82 | 0.16 | 0.16 | 0 |
| Dredge Tailings | 3.53 | 0.04 | 0.04 | 0 |
| Talus | 0.90 | 0 | 0 | 0 |
| Developed | 2.80 | 1.05 | 0.45 | 0.60 |
| **Total** | **21.82** | **3.35** | **1.89** | **1.46** |

Clearing and grading for construction of the permanent Yankee Fork weir facility would result in the permanent removal of 0.86 acres and the temporary removal of 1.44 acres of vegetation (Figure 13). Permanently cleared areas would be replaced with asphalt and gravel road, gravel parking areas, and other facility infrastructure (e.g., bridge-supported weir, adult holding and spawning facility).

The majority of the activities would occur in the upland shrub cover type, affecting approximately 0.92 acre of this type. Clearing and grading work in this cover type would remove mostly native species including mountain alder and willows. Approximately 11 native trees, (mostly lodgepole pine and quaking aspen saplings) would also be removed. Construction of the temporary bypass channel and weir would require the removal of approximately 0.33 acre of riparian vegetation (mostly mountain alder and willows). Of this, only 0.01 acre would be a permanent removal associated with permanent structures, the temporary vegetation removal, which affects the inlet and outlet of the temporary bypass channel, would be replanted when construction is complete.

The operation of the Yankee Fork weir facility could increase potential for the spread of invasive species and noxious weeds, though development and implementation of a site-specific vegetative management plan (as required in the mitigation measures) would minimize this potential at the weir site and in the immediate vicinity.

Overall, only 11.47 acres are currently vegetated (total area minus ‘developed,’ ‘talus,’ ‘dredge tailings,’ and ‘stream’). Of these, only .84 acres would be permanently affected. This is approximately 7% of the vegetated area within the project site and less than 4% of the entire project area. The effects on upland vegetation conditions are low.

## 3.4 Alteration of Hydrologic or Biological Processes

### 3.4.1 Ability of the Channel to Change Course, Re-occupy Former Segments, or Inundate Its Floodplain

Aerial photographs show very little channel migration of the Yankee Fork between 1999 and 2004. The channel is constrained by sections of riprap along its eastern bank, which parallels Yankee Fork Road. No lateral movement and migration into the terrace feature along the channel’s western bank, which is a heavily vegetated area, is evident from the aerial photographs.

Construction of the weir in the place of the road’s existing riprap will not change the river’s potential to change course or migrate within its floodplain to the east. Future channel migration would be most likely to occur on the west bank, which is not along Yankee Fork Road. This would be no change from the current condition.

### 3.4.2 Streambank Erosion Potential, Sediment Routing and Deposition, or Debris Loading

The proposed bridge weir would create a backwater effect while operating with the bridge and picket panels deployed in the channel by increasing depths and reducing flow velocities. The backwater effect would reduce the sediment transport potential of the Yankee Fork in the affected reach upstream; this could lead to sedimentation. Since the Yankee Fork is a moderately steep channel, the backwater effect would be relatively low and not extend far upstream. The physical barrier created by the weir would block sediment and debris coming downstream. The potential for the bridge weir to trap sediment and debris is most likely to occur during the high-flow months of late spring and early summer. Because of this, the bridge and picket panels would be rotated out of the channel during high-flow months to an elevation 2 feet above the 100-year flood elevation leaving only the weir sill and abutments in place. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. Furthermore, a jib crane would be permanently installed adjacent to the bridge weir and would be used to remove debris from the weir that may accumulate during low-flow conditions. These measures would prevent the weir from creating a major flow obstruction that would lead to problematic sedimentation or debris accumulation. Any sediment deposited upstream of the weir during low-flow conditions would likely be transported quickly out of the reach with the return of higher flows.

### 3.4.3 Amount and Timing of Flow

The proposed permanent Yankee Fork weir facility would require the diversion of approximately 10 cfs of water from the Yankee Fork through the adult holding facilities. Since the facility is a non-consumptive use, the entire water volume would be discharged back to the Yankee Fork approximately 1,260 feet below the intake via the fish ladder. Water would be diverted between June and mid-October of each year when the monthly mean flow of the Yankee Fork would range between 934 cfs and 73 cfs, (USGS 2015a); thus, the diversion would vary between a spring minimum of 1% of Yankee Fork flow, and a late summer maximum of 14% of Yankee Fork flow

(Table 4). These flow changes would only affect the 1,260 feet of the Yankee Fork located between the intake diversion and the discharge.

The proposed Yankee Fork weir facility would not require water diversion for acclimation of Chinook salmon smolts in the spring. The smolts would be acclimated in existing ponds connected to the river.

For these reasons, impacts on the flows in the Yankee Fork would be localized, would not result in a basin-wide or annual decrease in flow, and would, therefore, be **low**.

**Table 4. Mean monthly discharge (2012–2014) and percent to be diverted for adult holding**

| | Month | | | | | |
|---|---|---|---|---|---|---|
| | **May** | **June** | **July** | **August** | **September** | **October** |
| Yankee Fork | | | | | | |
| Mean Monthly Discharge (cfs) | 934 | 596 | 196 | 88 | 73 | 90 |
| Percent Diversion | 1.1% | 1.7% | 5.1% | 11.4% | 13.7% | 11.7% |

### 3.4.4 Flood Storage (Detention Storage)

Operation of the bridge-supported weir would not be expected to adversely affect the 100-year floodplain of the Yankee Fork. The permanent structures in the floodplain (bridge-supported weir abutments, intake structure) would likely not significantly obstruct the floodway or cause a rise in the 100-year flood elevation. Although the proposed weir panels would extend below the 100-year flood elevation when deployed, they could be rotated out of the river channel during high flows and are designed to be approximately 2 feet above the 100-year flood elevation in the up position. There would be no change to the detention storage capacity of the floodplain from the construction or operation of this facility.

### 3.4.5 Biological Processes

#### *3.4.5.1 Reproduction, Vigor, Growth and/or Succession of Streamside Vegetation*

As discussed in Section 3.2.1, riparian vegetation within the project area is limited to a narrow corridor immediately alongside Yankee Fork and the new facility will temporarily impact approximately 60 feet of streambank during installation of the abutments with only 0.01 acre being permanently lost within the final footprint of the structures. This small amount is of very little effect to stream or floodplain function, and will have no impact on the remaining habitat's reproduction, vigor, growth and/or successional development.

#### *3.4.5.2 Nutrient Cycling*

Given the very small amount of streambed, bank, and riparian habitat altered there is expected to be very little, if any, impact on nutrient cycling within this stream. There will likely be an increase of nutrients during the spring acclimation period as fish waste from the acclimation ponds will flow into the Yankee Fork. As discussed above, however, fish will be acclimated in batches and the discharged organic solids would not be highly concentrated to minimize adverse impact from this additional input. The effect on nutrient cycling, if any, is expected to be localized, with no effect upstream or further downstream in Yankee Fork.

#### *3.4.5.3 Fish Spawning and/or Rearing Success*

Effects on fish spawning and/or rearing success would come from temporary impacts on their habitat during construction, long-term losses or impacts on their habitat from the presence and operation of the completed facility, and the direct impacts from trapping fish.

**Construction Impacts**

During construction there will necessarily be a high degree of short-term impact on spawning habitat from the operation of machinery in and along the Yankee Fork and the sedimentation, vegetation loss, and disturbance such activity entails. This activity, however, is temporary and timed to occur outside of the spawning and juvenile migration period so spawning or migrating fish will not be directly affected. Construction will also proceed under the constraints of multiple mitigation measures designed to protect water quality and fish habitat.

**Operational Impacts**

During operations, the primary effect on fish and fish habitat is the reduction in flow in the 1,260-foot reach between the water intake and the outflow at the fish ladder (Section 3.4.3). This reduction, however, is small relative to typical year-to-year variations caused by flow variation under natural conditions (Table 4). The section of river with reduced flow is a small proportion of the habitat available in the basin as a whole, and is not of exceptional value relative to adjacent upstream and downstream reaches of the stream. There is ample habitat for spawning and rearing upstream of the intake as well as downstream of the outfall. This small reduction in the proportion of available flow between the intake and fish ladder is not sufficient to produce an impediment to migrating fish. Because the water use would not dewater the stream, and fish use would likely be concentrated in deeper areas during extreme low flows, it is likely that fish in the affected section of the stream would only experience a small reduction in available habitat.

As discussed in Section 3.1.2 there would be negligible impact on water quality from fish occupancy of the acclimation ponds and chemical uses during active trapping and holding activities. Little, if any, effects to fish spawning or rearing is anticipated from this level of water quality impact.

Short-duration, localized turbidity inputs from use of the jib crane can be expected creating temporary impacts on fish in the immediate work area by impairing foraging, delaying migration, or exposing their gills to silt.

**Fish Capture Impacts**

The Yankee Fork fish trapping facilities would be operated from June to September each year to collect Chinook salmon for broodstock. This directly impacts their natural spawning behavior and opportunity.

The weir would direct fish to the fish ladder and to the sorting and holding facilities. In the sorting pond, fish would be sorted, and non-target fish, such as bull trout, steelhead, and other game and non-game fish would be released upstream of the weir. In addition, if bull trout were observed congregating above or below the weir, some of the weir pickets would be temporarily rotated out of the water to allow passage by the fish.

Operation of a weir could affect fish in several ways. Direct impacts such as injury could occur at the time of capture, while indirect impacts such as changes in behavior or health from delayed migration could occur later. Fish would be typically trapped and handled at the weir and the presence of a weir could lead to delay in upstream and downstream migration of fish. Consequences of migration delay can vary depending on site-specific conditions and context. Extended migration delay lasting more than 24 hours or delay during periods when temperature and habitat conditions are unfavorable can have a number of adverse effects on salmonids (McCullough 1999; Goniea et al. 2006; Bjornn and Reiser 1991). Delayed migration in high-current areas can increase energy expenditure, reducing energy reserves necessary for successful spawning. Delay during periods with elevated water temperatures can increase exposure to unfavorable temperature conditions, resulting in reduced survival and fitness. Migration delay in locations without suitable cover can expose migrating fish to predation and poaching mortality (Cuenco and McCullough 1996; McCullough et al. 2001).

Measures to avoid, minimize, and mitigate effects to ESA-listed fish from these activities would be implemented as advised by consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. These would include measures such as limiting the duration and frequency of collection activities to avoid and minimize migration delays, and adopting procedures intended to minimize stress and injury from handling and release after inadvertent capture in trap facilities.

#### *3.4.5.4 Riparian Dependent Avian and Amphibian/Mollusk Species' Needs*

The riparian habitats near the Yankee Fork weir are likely used by a wide range of species associated with rivers, including osprey , great blue heron, mink, and water vole. The river and associated wetlands and side channels are likely used by amphibians, such as Pacific chorus frog, long-toed salamander, western toad, Idaho giant salamander and possibly the Columbia spotted frog, a USFS Sensitive Species. Birds that may use riparian areas include grouse, willow flycatcher, Wilson's warbler, and song sparrow. No sensitive or listed species of mollusk are known to inhabit the area.

**Short-term construction impacts**

Construction would involve re-routing the main Yankee Fork channel into a temporary channel for approximately two weeks during low flows in the fall. While this may affect amphibians and aquatic invertebrates using this portion of the river, amphibian use of the main channel is likely low due to the high flow energy and low water temperatures in the stream, and the overall effect is expected to be low and temporary.

Construction would avoid vegetation clearing during the spring breeding season (April 1 to July 15) to avoid disturbing active nests or den sites during construction. Most wildlife could thus simply avoid the site during construction. Smaller animals that may be present on site throughout the year, such as amphibians and rodents, may be injured or killed during site clearing, grading, and dewatering, a moderate impact.

Construction would potentially result in mortality of any slow-moving amphibians present in the areas of clearing and active construction, but as the facility area contains little habitat suitable for frogs and both construction and operations would occur subsequent to their late-spring breeding period, few individuals are anticipated to be at risk. The resulting impact would be **low**.

**Long-term operational impacts**

The permanent footprint of the proposed facility would eliminate the habitats that would be displaced by it. Only .01 acres of riparian habitat will be permanently lost so the overall impact on riparian dependent species would be low.

The water diversion serving the holding ponds and fish ladder have the potential to entrap amphibian adults, larvae, or eggs through the intake systems. The use of fish screens would help to minimize such mortality.

Disturbance from noise, lighting, and human activities is expected to be low. This area is adjacent to a campground and has seen weir operations for many years, so species in this area are likely accustomed to human generated noise, light, and activity.

## 3.5 Magnitude and Extent of Potential Off-Site Changes

As discussed above, there would be minimal changes and effects from this action on flow, hydraulics, and floodplain function for Yankee Fork. The scale of likely changes to the banks and channel is measured in fractions of an acre and well within the degree of change the river naturally experiences. Flow of water below the facility would not be altered in either amount or timing.

There is thus no potential for physical effects to extend to other parts of the river system and no off-site changes as a direct result of this project other than a likely future increase in returning Chinook salmon in the Columbia, Snake, and Salmon Rivers. This is not an adverse effect, but a desired condition that would support potential future Wild and Scenic River designation for Yankee Fork. The indirect effects of these restored runs will likely increase recreation activity (fishing demand would likely increase along with camping, sightseeing, and recreation-based economic activity such as fishing guides, lodging and dining services on private lands, etc.).

## 3.6 Time Scale of Effects

There are two time scales to consider when evaluating effects of this facility. First is the <u>construction</u> period, which is expected to occur in a single year during the low flow months of July through October. The second period is long term, where the effects of facility <u>operations</u> must be considered.

Effects during the construction time frame are expected to be realized within a single year, with perhaps some residual effect during vegetative and physical 'recovery' of the site for perhaps two to five years thereafter. Construction impacts and effects (vegetation impacts, turbidity, traffic, noise, etc.) to Wild and Scenic River values during this timeframe will be temporary, with the expectation that few (e.g. vegetation recovery) will be evident even one year following construction.

The operational effects, and those resulting for the presence of the facility, however, have no scheduled end. These effects can include the minor localized effects on water quality and flow through the stream length of the facility, and significant improvements in fish populations.

The long-term goal of recovery of ESA-listed Chinook salmon is the overriding interest and focus when evaluating time-scale of effects from this project.

## 3.7 Project Effect on Wild and Scenic River Management Goals

### 3.7.1 Effects on Free Flow

The Proposed Action will not change the free-flowing character of the river downstream from the facility. There are no impoundments, and no straightening or redirection of the river. There is however a 1,260 foot-long non-consumptive water diversion, abutments on each river bank, and a narrow slab across the river bed with temporary/ removable screening sufficient to trap fish and block passage from June through September, with no hindrance to fish or animal movement at other times of the year.

#### *3.7.1.1 Water Diversion Effects*

There is no consumptive water diversion that would reduce flows downstream from the facility. There may be a small volume of water loss due to evaporation, spills, or any leaks during flow-through, but this will likely be miniscule.

There would be a non-consumptive water diversion between the intake and the fish ladder as described above. The distance between the intake and the discharge through the fish ladder is approximately 1,260 feet. The water flow rate through the facility would be approximately 10 cubic feet per second (cfs), so flow in the Yankee Fork would be diminished by this amount in the reach between the intake and the discharge.

Flow in the Yankee Fork typically ranges from a winter low of about 40 cfs to a spring peak of up to 2000 cfs. The facility would be operated between June and October, during which time the monthly mean flow of the Yankee Fork ranges between 934 and 73 cfs, respectively (USGS 2015a). On average, facility water requirements would divert up to a late summer maximum of 14% of Yankee Fork flow (10 cfs usage relative to mean flows of 73 cfs). Historically, flows in the Yankee Fork have been as low as 48 cfs (daily mean) in September, which would result in use of up to 21% of the streamflow for facility operations. Earlier in the summer, when flows are higher, the flow reduction would generally be less than 5% of streamflow. These flow reductions in this length of stream are expected to have minimal effect on fish and riparian habitats.

#### *3.7.1.2 Weir Effects*

The weir neither impounds water nor redirects its flow. It merely serves as a support for the panels that will direct fish passage into a fish ladder and holding tanks. It has no effect on the flow of water down Yankee Fork beyond its immediate passage over the sill (see Section 2.2).

#### *3.7.1.3 Allowance for Structures in Recreation Wild and Scenic Rivers*

The Act allows for "minor structures at the time any river is proposed for inclusion in the Wild and Scenic River System." For these segments, that time of *formal proposal* has not yet arrived. These segments have been found *eligible*, but a *suitability determination* (which must precede a *proposal*) has not yet been made, so full protection from structures is not yet required. Additionally, the scale of the structures considered here is consistent with the scale of structures discussed as being allowable for rivers proposed for designation under the 'Recreation' category (Forest Service Handbook 1909.12 8.2).

Thus, construction of this facility does not automatically compromise this Segment's eligibility for Wild and Scenic River designation. The deciding official can consider whether the in-stream structures proposed here can be authorized in this decision and likely fit the category of 'minor' allowable structures that would not compromise the free flowing characteristics of the river at the time it is formally proposed, if ever.

The Wild and Scenic Rivers Act makes clear, however, that such allowance for structures "shall not be construed to authorize, intend, or encourage future construction of such structures in components of the national wild and scenic rivers system."[10] While this only applies to rivers within the system, the intent appears clear, when considered alongside the protective intent of Forest Service policy, that such allowance not be construed as liberty to construct. Nonetheless, as discussed below, these structures are intended solely to enhance **Fish**, a critical ORV for this

[10] Public Law 90-542 at Section 15. (b).

river.  Additionally, the structures are intended for removal once species have fully recovered; they aren't intended to be there in perpetuity, as is the designation of a Wild and Scenic River.  Therefore, a case for responsibly considering and approving these structures can be made.

### 3.7.2 Effects on Water Quality

As discussed in detail in 3.1.2 above, there will be insignificant impacts on Yankee Fork's water quality from the construction and operation of the weir facility.

### 3.7.3 Effects on Floodplain Conditions

As discussed in detail in 3.2.3 and 3.4.4 above, there will be insignificant impacts on Yankee Fork's floodplain conditions from the construction and operation of the weir facility.

### 3.7.4 Effects on ORVs

#### *3.7.4.1 Effect of the Proposed Action on the Recreation ORV*

The Proposed Action will not change the flow of the river downstream from the facility.  Recreation opportunities dependent on river flow such as fishing, kayaking, swimming, etc., would not be affected below the facility.  There may, however, be an effect on launching sites for kayakers.  At present, kayakers can park in or near the Pine Flat Campground and launch their kayaks below the temporary weir, carrying their craft only 100 to 150 feet to get to the river bank below the weir with a single crossing of Yankee Fork Road.  The proposed development, however, creates a scenario where river users must walk approximately 300 to 400 feet, most of it along Yankee Fork Road, before being able to launch their craft below the weir facility.  The proposed development provides parking sites, but no convenient or safe access to the river above or below the facility.

The installation of a permanent weir across the river would adversely impact river rafting and kayaking as the temporary weir does now.  The existing temporary weir was not in place when the original eligibility determination was made, so it was not a consideration when eligibility was determined.  Launching sites above the canyon, yet below the gravels on private land upstream are limited to this section of the river at Pine Flat campground for those seeking to run the canyon below.  The limiting of safe river access by this facility detracts from the Outstandingly Remarkable Recreation Value.

The Proposed Action places an industrial-style facility (concrete structures, metal buildings, and chain-link fencing) on the banks of the Yankee Fork very near a developed campground.  These structures, however, would be constructed to minimize the potential for adverse visual effects by using color and texture to best blend in to both the natural landscape and the existing structures in this valley (in Segment B).  A vegetated berm would be constructed to screen this development from the Yankee Fork Road and Pole Flat Campground, and lighting would be muted to minimize light pollution.  The effects of this development using the mitigations described above are disclosed in Chapter 3 of the EIS under 'Visual Quality.'  The conclusion there is that there would be no adverse visual effects and that the Visual Quality Objective of 'Retention' (the most protected, pristine, etc.) would be met.  However, this assessment of negligible visual impact is accomplished through mitigation and is designed primarily for the benefit of those traveling on Yankee Fork Road.  The facility is not rendered invisible and would be readily seen by viewers on the river and its banks.  Road travelers may not see it in its fullness, but river users would, and the primary focus of this ORV is river-focused recreation.

In summary, the development would have an adverse effect on river-based recreation at this location.  It removes river frontage from access near a campground and at a location with limited river access above the canyon and below private land.  It creates a barrier around which river users must portage, and it places an industrial-appearing facility within a near-natural-appearing landscape.

While the facility compromises the ***Recreation*** ORV at this location in Segment A, such a compromise is not wholly inconsistent with the nature of Segment B immediately upstream (thus the efficacy of the visual mitigation measures discussed in Chapter 3 of the EIS). Segment B is characterized by human activity and development on private land.

Nearly all of Segment A is downstream of the proposed facility, and would remain unaffected. The ***Recreation*** ORV within the canyon remains unchanged. Once a river user enters the canyon, the scenery and river conditions change measurably, and expectations of a human-influenced landscape are left behind. Only the small stretch of river within Segment A above the canyon is affected.

Both Segments A and B were found eligible under the ***Recreation*** category for Wild and Scenic Rivers that, according to Forest Service Handbook 1909.12.8.2 for designated rivers allow for existing minor instream structures (low-head dams, diversions, rip rap etc.) but prohibits new structures and developments. These segments are not yet designated, nor yet assessed for their suitability (see distinctions under "***Free Flowing***" above). As such, constructing the facility at this time may not be prohibited by USFS policy and may not compromise continued eligibility of this Segment. In addition, by including improvements and mitigation for river-based recreational use at the site (by providing safer access than exists now and a modest launch site below the weir), the facility can be made to improve river-based recreation such that a future suitability determination might even be strengthened. The site is not wholly inconsistent with Segment B, and can augment recreation values within Segment A.

While there would be impacts on the ***Recreation*** ORV, the effects of those impacts do not necessarily disqualify this River from continued eligibility for future Wild and Scenic River designation.

#### *3.7.4.2 Effect of the Proposed Action on the Geology ORV*

The geology of the area would not be affected by the construction of a weir across the Yankee Fork. Views of the geology in the canyon below the proposed development would not be affected. The only place where views of the geology in Segment 3 might be affected could be where travelers on the Yankee Fork Road travel downstream through the scenic transition from the valley (with its evident human occupation) to the canyon (where human occupation is absent). This weir facility would be the last constructed facility visible as they might view the upcoming canyon-forming geologic features. This is likely to be of no consequence to most river users and is not expected to have any adverse effect on the ***Geology*** ORV as it relates to the eligibility determination for this river segment.

#### *3.7.4.3 Effect of the Proposed Action on the Fish ORV*

The effects on fish (Section 3.4.5.3) from the Proposed Action are variable depending on the species and/or the timeframe considered. Adverse effects to fish could be expected during construction of the weir and its attendant facilities. There may be some adverse effect to bull trout, which have benefitted in the absence of Chinook salmon, but the overriding effect of the Proposed Action is an expected restoration of threatened Chinook salmon runs sufficient to support Tribal and recreational fishing in the future. This is an overwhelming beneficial effect on this ORV and strengthens this river segment's eligibility for future designation.

For the purposes of this assessment, it is important to recognize that salmon restoration efforts and their attendant facilities, such as this project, are intended to be temporary until fish runs are restored. 'Temporary' in this context may mean many decades, but the intention is that these artificial means of re-establishing and supporting fish runs would ultimately become unnecessary as native and naturalized populations provide all the reproduction and escapement necessary to maintain populations at desired levels. From a Wild and Scenic Rivers perspective, this translates into short and medium-term impacts for long-term gains.

#### *3.7.4.4 Effect of the Proposed Action on the History ORV*

There would be no adverse effect to the ***History*** ORV. The original finding of the 1998 team focused on structures, town sites, cemeteries, etc. in Segment B. The Proposed Action impacts none of these, as none are present within, or visible from, the project site. The only effect to historic values is the relocation of Yankee Fork Road (see EIS, Chapter 3) which overlays portions of the historic Stanley to Bonanza Wagon Road and the Custer Motorway Adventure Road segment. Both of these, however, were found to lack sufficient integrity within the project area to warrant protection. There will thus be no effect on eligibility for potential Wild Scenic River Status from any impacts on the ***History*** ORV.

#### *3.7.4.1 Effect of the Proposed Action on the Cultural ORV for Segment A*

Similar to the discussion under ***History*** above, no <u>cultural sites</u> eligible for listing in the National Register of Historic Places were identified as being likely affected by the Proposed Action. There would, however, be a positive effect on the <u>cultural values</u> of the Tribes as they relate to fish and fishing.

Implementing the Proposed Action's facilities and programs will enable the Shoshone-Bannock peoples to better meet their "solemn obligation to protect, preserve and enhance native species of deep cultural significance to the Tribe" (Shoshone-Bannock Tribes 2011). The Tribes' cultural objective for this project is to ensure that Shoshone-Bannock peoples can harvest salmon in Yankee Fork by their traditional hunting methods as well as contemporary methods.

Construction and successful operation of this facility would have a beneficial and strengthening effect to the ***Cultural*** Outstandingly Remarkable Value considered for this river segment's eligibility.

### 3.7.5 Effects on River Classification

The installation of a permanent fish-trapping weir as proposed for the Yankee Fork in this Proposed Action would not nullify the eligibility of Segment A or Segment B for designation as a Recreation Wild and Scenic River.

The ***Recreation*** ORV would be the most affected by the placement of this industrial-appearing facility in a location that hinders access to the river at a desired launch location for kayakers and rafters. Facilities of this scale, however, are acceptable (prior to proposal) within rivers proposed as Recreation Wild and Scenic Rivers, and mitigation to resolve recreationists' safety concerns and improve river access might effectively override other concerns associated with the river-spanning weir or visual impacts.

# 4 Determination

This analysis discloses that installation of a weir across Yankee Fork would temporarily compromise the **free flowing** character of the river (during construction only), but would have no lasting effect. The analysis also discloses the concerns for visual effects, recreation access, and river-user safety these facilities generate that could compromise the ***Recreation* ORV.** The analysis also discloses that these facilities are integral to the recovery of Chinook salmon in the

Yankee Fork and that the increased fish returns that would result from construction and operation of these facilities would greatly enhance the ***Fish*** and ***Cultural*** **ORVs** for this river segment.

This analysis also supports the mitigation measures provided for in the EIS that can effectively offset the access and safety concerns affecting the **Recreation ORV**. Additionally, the analysis makes clear that these facilities and their effects are intended to be short and mid-term in duration with a long-term goal of removal as fish returns are restored.

Though the project creates some adverse impacts on some ORVs for which this river segment was found eligible as a Recreation Wild and Scenic River, it also provides benefits to other ORVs by the operation of the facilities, and by the mitigation proposed for the visual, access, and safety concerns identified.

Construction of the facilities on the Yankee Fork as disclosed in the Crystal Springs Hatchery EIS with the mitigations proposed in the EIS would not compromise the Yankee Fork's continued eligibility for inclusion in the Wild and Scenic River System and that Recreation would continue as an Outstandingly Remarkable Value.

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## Appendix D.2
Panther Creek

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

# Panther Creek Permanent Weir and Fish Trapping Facility

## Wild and Scenic River, Section 7 Analysis

July 2016

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# 1 Introduction

## 1.1 Background

The U. S. Forest Service (Forest Service) and Bonneville Power Administration (BPA) are evaluating a proposal from the Shoshone-Bannock Tribes of the Fort Hall Reservation (Tribes) to place a permanent fish collection and acclimation facility on Panther Creek. This facility is part of a larger program that BPA is analyzing in the Crystal Springs Hatchery Program Environmental Impact Statement (EIS). For the purposes of this Section 7 analysis, the term "Proposed Action" will refer to just the Panther Creek weir facility rather than the entire program being evaluated in the EIS.

Panther Creek has been determined by the Forest Service to be eligible for designation under the Wild and Scenic Rivers Act, 16 U.S.C. 1271 *et seq.*, as a Recreation Wild and Scenic River. As part of the agencies' evaluation of the Tribe's proposal, this analysis is being conducted to identify the effects the constructed facility might have on the river's values that make it eligible for designation as a Wild and Scenic River.

### 1.1.1 Classification and Protection Status of Panther Creek

The Forest Service determined Panther Creek to be eligible under the "Recreation" classification for Wild and Scenic River status in 1993. This river is listed in the National Park Service's Nationwide Rivers Inventory[1] (Table 1).

**Table 1. Description of Eligible Reaches of Panther Creek**

| **River** | **Panther Creek** |
|---|---|
| **County** | Lemhi |
| **Reach** | From the mouth in NW 1/4 of Section 19, T. 23N. , R.18E. to the origin in SE 1/4 of Section 2, T.17N., R.18E |
| **Length (miles)** | 45 |
| **Year Listed / Updated** | 1993 |
| **Potential Classification** | Recreation |
| **ORVs** | Scenery, Recreation, Wildlife |
| **Description** | The entire drainage is recognized as a distinctive visual resource. The upper portions of the stream are characterized by gentle canyon morphology. The lower half of the stream follows a deep, rugged canyon. |

While Panther Creek has been determined to be "eligible," it has not yet been "designated." ***Eligibility*** is a determination made by a river-managing federal agency that this segment meets certain criteria and may be suitable for designation. ***Designation*** is only by an act of Congress or a State's application to the Secretary of the Interior. It is by designation that an eligible river attains Wild and Scenic River status and protection. Eligible rivers are not protected by the Act,

[1] NPS Nationwide Rivers Inventory, at http://www.nps.gov/ncrc/programs/rtca/nri/states/id2.html

but Forest Service policy is that a river found to be eligible and suitable[2] must be protected as far as possible to the same extent as a congressionally-designated study river.[3] Forest Service policy for river corridors identified in the National River Inventory is to protect the river's free flowing characteristics and its Outstandingly Remarkable Values (ORV); and that management and development of the identified river and its corridor not be modified to the degree that eligibility or classification would be affected. This policy of protection is to be continued until a decision is made as to the future use of the river and adjacent lands.[4]

Section 7(a) of the Wild and Scenic Rivers Act provides a specific standard for review of developments below or above or on a stream tributary to a designated river. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present in the area as of the date of designation."

### 1.1.2 Description of Panther Creek

Panther Creek is a major tributary to the middle reaches of the Salmon River. With a watershed covering about 1,800 square miles, it flows for approximately 45 miles from its headwaters to its confluence with the Salmon River. The location of the proposed permanent fish collection and acclimation facilities site of the Proposed Action is located approximately 25 miles up from the confluence with Salmon River (river mile 25).

Panther Creek's flows can be quite variable. It averages about 285 cubic feet per second (cfs) but can be as low as one tenth of that or as high as ten times that average. Varying snowmelt patterns within the watershed cause significant runoff events in early spring through late summer. Snowmelt in the lower reaches begins in the early spring while snowmelt on the higher reaches occurs in early to mid-summer. The greater snow pack in the higher elevations causes greater runoff in the summer months, thus causing larger stream flow discharge in the mid to late summer.

The river flows through mountains that are generally flat-topped with steep "V"-shaped drainages supporting dense conifer forests on their northerly slopes with sagebrush and grassland plant communities on south-facing slopes. In the lower half of the watershed, the river flows through a variety of landforms where its character changes dramatically (see further discussion under ***Scenery***, below).

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[2] 'Suitability' is the second level of analysis for a potential Wild and Scenic River. First is 'eligibility', second is 'suitability', then the forwarding of a 'suitable' river for legislative consideration, then possible Congressional designation as a Wild and Scenic River. A Suitability Determination has not been conducted for Panther Creek.

[3] Forest Service Manual 2354.21

[4] FSH 1909.12, Chapter 8, Section 8.12

**Figure 1. Panther Creek**

#### *1.1.2.1 Free-Flowing Character*

Section 2(b) of the Wild and Scenic Rivers Act (P.L. 90-542) requires that all rivers considered eligible for designation need to be "free-flowing." Section 15 (b) of the Act defines a "free-flowing" river as one which is in a "natural condition" and without impoundment, diversion, rip-rapping, or other modifications of the waterway. It also states that existence of low dams, diversion works, and other minor structures shall not automatically bar its consideration, though such construction is discouraged.

In the Salmon-Challis National Forest's 1993 Wild and Scenic Rivers Evaluation, the Forest Service determined that Panther Creek was eligible for designation under the Wild and Scenic River System. It is inferred that the Forest Service determined Panther Creek to be free-flowing in a natural condition for its entire length. Though no record of that determination is available, this is the minimum criteria that must be met for eligibility determination. That same free-flowing condition remains today as it was in 1993. Though there are numerous bridges that cross the river, there are no impoundments or major de-watering diversions that significantly alter the river's flow.

Panther Creek Road is located in the valley bottom almost its entire length from the mouth of Panther Creek to a few miles below the Morgan Creek Summit, and encroaches on the stream and floodplain in some locations. Throughout this sub-watershed, particularly from Deep Creek upstream to Blackbird Creek, Panther Creek Road has encroached on the floodplain. From the Cobalt town site up to Blackbird Creek the road encroaches on the active channel and the road is flooded at high water events. This encroachment has resulted in reduced capacity for flood flows and a reduction in riparian vegetation and stream cover (USFS 2008). This condition, however, was present in 1993 and deemed by the Forest Service at that time to not compromise the free-flowing character of this river sufficient to disqualify it from consideration.

#### *1.1.2.2 Water Quality*

The Panther Creek drainage has experienced significant water quality issues associated with present and historical mining operations, particularly in the Blackbird Creek drainage, downstream of the proposed fish collection facility. Panther Creek is on the 303(d) list for copper from Blackbird Creek to Big Deer Creek, which lies downstream of the proposed weir site. This listing occurred in 1998, five years after the eligibility determination, though it appears from the timelines outlined in the Idaho Department of Environmental Quality's 2001 Subbasin Assessment for Panther Creek (IDEQ 2001) that the Salmon-Challis National Forest likely knew of the water quality concerns, yet found the river eligible anyway.

Water quality above Blackbird Creek, which enters Panther Creek 0.9 miles below the facility, is considered 'good' with no identified pollutants of concern (IDEQ 2001).

## 1.2 Outstandingly Remarkable Values (ORVs)

The Nationwide Inventory and the Salmon Nation Forest records differ on Panther Creek's ORVs.

The Nationwide Rivers Inventory lists Panther Creek as being found eligible with ***Scenery***, ***Recreation*** and ***Wildlife*** as its ORVs, and includes the following summary: *"The entire drainage is recognized as a distinctive visual resource. The upper portions of the stream are characterized by gentle canyon morphology. The lower half of the stream follows a deep, rugged canyon."*

There is no documentation available from the Forest Service concerning the evaluation of this river. The only documentation available is a single table titled "*Results of Wild and Scenic River Eligibility*" dated September 21, 2004. In this list, Panther Creek is identified as having ***Scenery***, ***Recreation***, ***Geology***, ***Fish, and Wildlife*** as its ORVs with no additional rationale provided.

**Table 2. Salmon-Challis National Forest and National Rivers Inventory assignment of ORVs**

| | Salmon-Challis National Forest | Nationwide Rivers Inventory |
|---|---|---|
| **ORVs** | *Scenery, Recreation, Geology, Fish, Wildlife* | *Scenery, Recreation, Wildlife* |

For this assessment, a review of the effects of the Proposed Action on Panther Creek's eligibility for Wild and Scenic River designation will be conducted against the Salmon-Challis National Forest's list of ORVs since it is the most inclusive.

### 1.2.1 Scenery

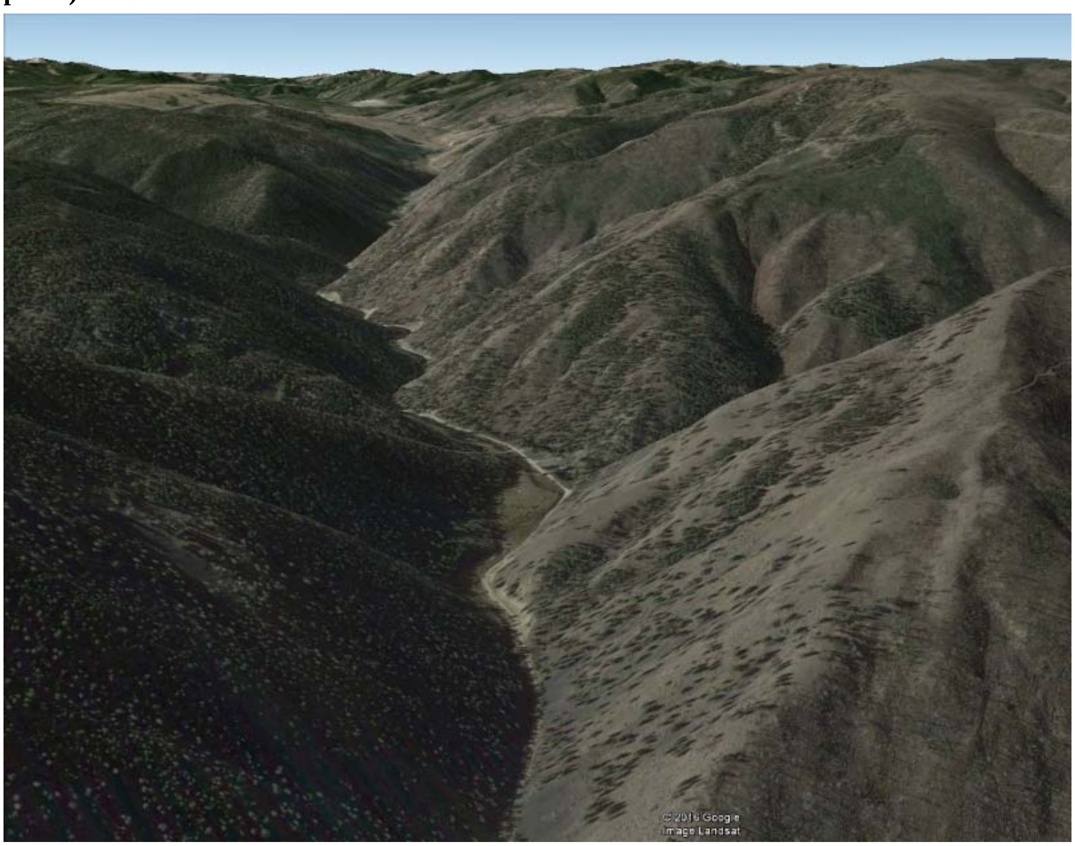
The Panther Creek Watershed is a unique and scenic area with striking contrasts between areas of extensive resource development and disturbance (such as is found in the Blackbird Mine area), and areas with relatively little evidence of human use (USFS 2008). That contrast is especially evident in views available from Panther Creek Road. Panther Creek Road is an often-recommended scenic tour that travels the entire length of Panther Creek from near its headwaters to its confluence with the Salmon River. Along this route, travelers can view wide-open panoramic scenes of forests on north-facing slopes; open sage and grassland vegetative communities on south-facing slopes; narrow canyons with striking geologic features; and a river that changes character dramatically with the seasons and the landscape through which it flows (Figure 2).

**Figure 2. Diverse Scenery along Panther Creek**

This diversity of scenery is most evident in the lower half of the river, while the stretch of Panther Creek along the Proposed Action's location is comparatively unremarkable.  This scenery is described in detail in Chapter 3 of the EIS.

The stretch of the Panther Creek corridor near the Proposed Action site is scenically unremarkable compared to other locations along Panther Creek.  This setting displays neither the canyon features nor the open vistas discussed above.  Here, the road winds through a narrow canyon that limits views of the surrounding scenery yet without eye-catching rock outcrops or dramatic canyon features.  The overall visual setting is captured well in the Google Earth view captured in Figure 3.

**Figure 3.  Southwestern (upstream) view of project area (near meadow along river in center of photo)**



### 1.2.2 Recreation

The ORV of Recreation along Panther Creek is its diverse offering of recreation opportunities across all four seasons. No specific single recreational pursuit stands out as Outstandingly Remarkable along Panther creek; it provides many widely-varying opportunities. Opportunities exist for both social interaction and moderate isolation from the sights and sounds of humans. Panther Creek offers scenic vistas and opportunities for sightseeing, kayaking, rafting, hunting, hiking, backpacking, horseback riding, mountain-biking, riding off-highway-vehicles, camping, picnicking, and fishing. Winter sports include cross country skiing and snowmobiling. There are two developed campgrounds along Panther Creek Road (McDonald Flat and Deep Creek), both adjacent to Panther Creek. There are numerous dispersed camping sites and four trailheads (including equestrian). While there is some use of these facilities for summer camping and picnicking, the majority of the dispersed camping occurs during the fall hunting seasons.

#### *1.2.2.1 Hunting*

Hunting, though perhaps the most common recreational use of the Panther Creek watershed, is likely not the outstandingly remarkable recreation value considered for eligibility simply because neither the river, nor its 0.25-mile corridor on either side is the focus of this recreational activity. Wild and Scenic Rivers ORVs should be directly river-related; they should "owe their location or existence to the presence of the river."[5] The river corridor here primarily serves hunters by providing camping locations, spotting sites (using binoculars and spotting scopes), and access routes (roads and trails) to hunting areas higher up in watershed. The Wild and Scenic River corridor (the river and 0.25 mile each side) is not, however, the focal location where hunters actually stalk big game, nor is the river itself the primary ecological attractor of big game that makes hunting possible here.

#### *1.2.2.2 Rafting and Kayaking*

Whitewater rafting and kayaking is available on Panther Creek though it is recommended for advanced floaters only. Opportunities are flow dependent and thus limited mostly to high runoff periods. The river is narrow and the rapids can be dangerous at times in many places, but challenging and desirable opportunities for experts are there.[6] Whitewater kayakers primarily run the river below Trapper Flat, approximately 7 miles downstream of the proposed Panther Creek weir facility (American Whitewater 2016b). One whitewater blogger stated "If Panther Creek was in California, Oregon, or Washington this would be a coveted whitewater run. Instead, the creek is tucked away near the Frank Church Wilderness in Idaho."[7] The 4-mile stretch from Clear Creek down to the confluence with the Salmon River is classified as a Class III run, which is attractive to less-experienced floaters.

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[5] NPS website on Eligibility Descriptions at http://www.nps.gov/ncrc/programs/rtca/nri/eligb.html

[6] See the video at https://www.youtube.com/watch?v=79k46AyoIUA for a depiction of the rafting challenges, and the video at https://www.youtube.com/watch?v=6wDUPzhvd84 for a sense of the popularity and attraction of this area for kayaking.

[7] OREGONRAFTING.ORG at http://www.oregonrafting.org/panther-creek-june-10-2014/

**Figure 4. Whitewater rafting on Panther Creek**

### *1.2.2.3 Fishing*

Panther Creek offers trout fishing in the summer, though it is less popular than other streams in the Salmon River drainage. Heavy metal pollution from historical operation at the Blackbird mine (higher in the watershed, up Blackbird Creek) may suppress fish populations (and fishing), and is a publicized heath risk for the river below Blackbird Creek. On-line reports of the fishing experience include comments like "few fish," "small fish," "beautiful setting," "great experience with or without the fishing," etc.

Salmon fishing is prohibited, since the species are federally listed, populations are low, and recovery efforts have not yet produced a sustainable population with enough fish to allow for sport fishing at this time.

### *1.2.2.4 Recreation at the Site of the Proposed Action*

Recreation at the site of the Proposed Action is primarily 'quick-stop' picnicking, fishing, sightseeing, etc. given its close proximity to the Forest Service's work center and the agency's use of the meadow across the river for pasture. There is a campground not too far upstream, but this location provides limited dispersed camping opportunity, no trail access to higher areas, etc. The primary attraction here would be the Forest Service's historical work center.

## 1.2.3 Geology

The geology in Panther Creek was likely considered an ORV for its scenic value (Figure 5), though there is no record to support which specific geologic aspect was valued. There are commercial mining and suction dredging values in this watershed, but those are generally inconsistent with the purpose for Wild and Scenic Rivers. Panther Creek is known as a place where rock collectors might find cassiterite and common opal[8] but that feature attracts few people. There is no rock-climbing attraction in the area.

[8] Idaho Department of Lands Gemstone Guide at http://www.idl.idaho.gov/mining/rockhounding/gemstones.html

Figure 5.  Geologic scenery along Panther Creek

The scenic values (within view of the river) of this geology are striking in places and have not been changed by human activity (other than fire-related scenic changes) since they were identified as outstandingly remarkable in 1993.

Steep canyon lands formed by stream cutting action characterize much of Panther Creek's geologic / geomorphologic character.  Slopes range in places from 60 to 90% and are dissected by shallow parallel drainages.  Rock outcrops and talus slopes are common.  Most of Panther Creek flows through narrow valley bottoms in which it is actively cutting its channel in bedrock, and some reaches are in wide valley bottoms in which it is meandering across a wide floodplain.

### 1.2.4 Fish

Anadromous runs of federally threatened Chinook salmon and steelhead, estimated to have once numbered several thousand fish annually in Panther Creek, have been dramatically reduced by factors occurring both within and outside the watershed including mining, timber harvest, grazing, wildfire, and water diversion (USFS 2008).

The Middle Panther Creek Watershed is designated as a PACFISH[9] priority watershed, emphasizing restoration of its fisheries resources and aquatic habitats as a primary management direction.  All perennial waters within the watershed have additionally been designated as critical habitat for federally threatened Snake River spring/summer Chinook salmon.  The mainstem of Panther Creek and seven of its tributary streams have been designated as critical habitat for federally threatened Snake River Basin steelhead (IDEQ 2001).

A significant amount of effort by Idaho Department of Fish and Game has been applied to reintroduce salmon runs to Panther Creek since the late 1970's (USFS 2008) and while occurrences of adult spawning have been observed in recent years, Chinook salmon and steelhead

[9] PACFISH is a 1995 Management Strategy for anadromous fish-producing watersheds on federal lands in eastern Oregon and Washington, Idaho, and portions of California.

have been largely extirpated from the drainage. Although fish populations have increased along main Panther Creek in recent years, they are still categorized as depressed.

The ***Fish*** ORV for these river segments is significant, and actions that enhance or support this ORV are desired. The purpose of this project is for just such restoration.

### 1.2.5 Wildlife

The abundance, diversity, and visibility of big game and other wildlife viewing opportunities along the river and in its surrounding areas, rather than the presence of any unique species, is the ORV of ***wildlife*** in Panther Creek.

The Panther Creek watershed provides optimal quality summer habitat for elk, mule deer, and white-tailed deer. There are bighorn sheep in its upper elevations and winter range for them along the river's lower reaches. These species can often be seen from Panther Creek Road. Bighorn sheep are known to be in the northern portion of the watershed and suitable habitat is available for mountain goats along the east side of Panther Creek below Napias Creek. At least two wolf packs (Jureano and Moyer Basin) are well established in the watershed and the likelihood of another (Hoodoo) moving into the Panther Creek area is a realistic possibility (USFS 2008).

The openness of the landscape in many areas and the lack of vegetative cover (even before the Clear Creek fire[10]), along with the abundance of big game and other wildlife, make this an attractive wildlife viewing area. There is ample opportunity to view deer, elk, and bighorn sheep from Panther Creek Road, and Panther Creek is included as the Morgan Creek-Panther Creek Sub-loop of the Idaho Birding Trail.[11]

At the project site, the value of this ORV is likely compromised by human activity and human occupancy at the adjacent Forest Service Cobalt Ranger Station; and viewing opportunities of smaller animals here are no more likely than anywhere else along Panther Creek Road.

## 1.3 Existing Facilities

The Panther Creek facility is located on site within the Salmon Challis National Forest's Cobalt Ranger Station (Figure 6). The proposed weir would be located in the left quarter of Figure 6. Forest Service staff uses the station during the summer months to coordinate field activities and forest fire response. There are approximately a dozen structures and a gravel parking lot associated with the field station, located on the west side of Panther Creek Road. A small bridge crosses Panther Creek at the station, providing access to pasture on the east side of the creek. The pasture is used for Forest Service livestock, primarily horses. There are no other landowners adjacent to this location. The proposed site for the Panther Creek facility and adjacent Forest Service work center is shown in Figure 7.

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[10] The Clear Creek Fire burned over 200,000 acres in the year 2000, much of it in the Panther Creek watershed.

[11] The Idaho Birding Trail is a network of sites and side-trips that provides the best viewing opportunities to see birds in Idaho. https://fishandgame.idaho.gov/ifwis/ibt/pub.aspx?id=about

**Figure 6. Forest Service Cobalt Ranger Station at site of Proposed Action (looking south)**

**Figure 7. Proposed facilities in relation to Forest Service work center**

## 2 Proposed Action

The proposed weir and associated facilities on Panther Creek is part of the larger Crystal Springs Hatchery Program, which includes a new fish hatchery near Springfield, Idaho, and two fish trapping weirs: Panther Creek and Yankee Fork. While this program achieves an array of purposes for differing federal agencies and the Shoshone-Bannock Tribes (see EIS, Chapter 2), its fundamental function is to support the recovery of ESA-listed Snake River spring/summer Chinook salmon. The description of facilities below will focus only on those associated with the weir in Panther Creek. The Crystal Springs hatchery and the weir on the Yankee Fork of the Salmon River are far removed from Panther Creek and have no impact on Panther Creek's Wild and Scenic River values.

### 2.1 Purpose and Need

The purposes of the Panther weir is to catch, hold, and spawn adult Chinook salmon to obtain eggs and milt for the hatchery; manage returning adult Chinook salmon; and monitor program success in meeting production and adult return numbers.

Panther Creek, though eligible for designation as a Wild and Scenic River, was selected as the location for this weir because of the need to restore the ESA-listed spring/summer Chinook salmon runs in this watershed. Locations on other rivers or streams would not have been effective in achieving this goal.

## 2.2 Construction Components

The proposal is to construct a permanent weir across Panther Creek with adult fish handling facilities and crew and equipment accommodations. These would all be constructed directly across the road and river from the existing Forest Service work center as shown in Figure 7.

The Panther Creek weir facility would consist of a bridge picket weir, a fish ladder, adult holding ponds, a spawning and egg preparation structure, acclimation ponds, pump station and valve vault, and an in-stream intake structure (as exemplified in Figure 8). The Panther Creek weir facility would be designed for up to 220 adult Chinook salmon. Top-hinged bridge weirs would be constructed to direct fish into a fish ladder that brings fish into a pre-sort holding pool. The fish ladder design flow is 10 cfs for this site. Holding pools are sized for long-term holding at 0.75 cubic feet per pound of fish, with water supply flow of 2.0 gallons per minute per pound of fish. Gravel access roads would service the fish trap infrastructure. The proposed construction components and construction activities are further described below.

**Figure 8. Example of a bridge weir in operation**

Fish holding tanks for juvenile acclimation are to be located immediately upstream of, and on the same side of the road and river as the Forest Service facility. This construction would introduce the following features into this river and its corridor:

- **Bridge Weir.** A new 38-ft weir with pedestrian bridge is proposed for Panther Creek. This weir would allow water to flow through a set of picket panels, but would limit adult fish passage, directing them toward a fish ladder leading to holding tanks. The bridge weir would be supported at each end by concrete abutments extending down to a foundation on each side of the stream. Within the creek, the weir would be based on U-shaped pre-cast concrete sections excavated approximately 7 feet into the stream bottom, which would be backfilled with cobbles and gravel and support a flat segment of concrete (the sill). Gates to control stream flow elevations would be mounted onto the sill at the stream bed elevation up to the walkway. The bridge portion of the weir would be steel construction, spanning the width of the creek. Rotating picket panels would attach to the upstream edge of the bridge and drop into place to seal against the concrete sill. Chain link fences and gates would be used to prevent public access to the bridge structure.

- **Jib Crane.** A jib crane would be installed adjacent to the bridge weir and used for debris management and possibly for lifting fish for transfer to transport trucks or from a live box to the holding pools if the fish ladder is not effective at attracting fish at critical collection times (i.e. during low flow).
- **Fish Ladder.** The weir's panels are designed to guide fish to a 2-foot by 3-foot ladder entrance built into a precast concrete weir abutment. A vertical bar gate would control access into the fish ladder. A canal gate would also be installed to control water flow and completely isolate the ladder from the river for maintenance purposes. The four ladder pools are 8 feet long and travel the required distance and elevation to the pre-sort holding pool. It is designed for 10 cfs flows over a range of creek elevations from 5,226 to 5,229 feet above mean sea level. The design of these pools and height of ladder allows fish to pass at different life stages. The ladder would be supported by a reinforced concrete slab extending from the east abutment sloping up to the adult holding tanks.
- **Adult Holding Ponds.** A finger weir would separate fish between the fish ladder and the pre-sort holding pond. The pre-sort pond would be 6 feet wide and dedicated to holding fish prior to sorting. After sorting, fish would be placed in one of the two 10-foot-wide post-sort holding ponds. Pass-through gates would be provided in the pre-sort pool walls to minimize the amount of lifting required to move fish from the pre-sort to post-sort pools. The ponds would be 32 feet long and designed with a 5-foot water depth. The concrete bottom of the pond would be at a similar elevation as the fish ladder, and would hold approximately 4.5 feet of water.
- **Spawning and Egg Preparation Structure**. The spawning structure would be three-sided and the egg preparation structure would be a fully enclosed steel structure. Both facilities would be located adjacent to the upstream end of the holding ponds. Both areas would have electrical outlets, radiant heaters and hydrants supplying river water for wash down and cleaning. The spawning area would have a fish return pipe to transport native fish back to the river upstream of the weir. During high water events, the fish ladder could be partially submerged, and the holding ponds would need to be pumped down to allow manual crowding and sorting of the fish. A pump station with two low head/high flow pumps would be located at the downstream end of the holding ponds. The utility water pump would also be located at this pump station.
- **Chemical Storage**. Aquaculture disinfection would be achieved through the use of formalin dosing. Formalin would be pumped from barrels in the chemical storage shed underground to the water supply in the post-sort holding ponds. The chemical storage shed would hold an entire operating season's quantity of formalin (two 55-gallon barrels), as well as the pumping and distribution piping.
- **Fish Trap Access Roads**. Access roads to the facility would be gravel surfaced.
- **Water Source.** Water would be supplied through an intake structure in Panther Creek. The water would flow though the facility and discharge back to the creek approximately 1,250 feet downstream through the fish ladder. Additional water would be supplied by an intake on Dummy Creek (the creek immediately below the Forest Service work center), to provide a colder water source for the adult holding pond as described below. If

approved for construction, the Tribes would apply for a non-consumptive water right from the Idaho Department of Water Resources to operate the Panther Creek weir facility.

- **Water Discharge**. Chemicals that would be used for operations would include iodophor (a chemical containing iodine used to disinfect fish eggs), or formalin (to prevent fungus growth on the eggs). During adult holding, individual fish may be given injections of Erythromycin-200, oxytetracycline, or other prophylactic treatments to counter specific diseases. 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 (EPA 2006). These chemicals would be stored in a chemical storage shed that would hold an entire operating season's quantity of formalin and iodophor, as well as the pumping and distribution piping. At the end of each season, the storage container would be removed and inspected prior to deploying it the next season.
- **Water Intake**. A pre-fabricated cone screen would be anchored to the streambed on the left bank of Panther Creek approximately 1,250 feet upstream of the proposed weir and acclimation pond to provide a 10 cfs water supply to the adult holding tanks and acclimation ponds. An additional intake structure would be located on Dummy Creek to the west of the holding tanks and provide a 1 cfs water supply to the holding tanks only. Both of these water supplies would be provided by gravity flow. Dummy Creek water is colder than Panther Creek in the late summer and would be used to improve holding conditions for broodstock during that time period. Water temperature can affect salmonid health, and using colder water could reduce the need for chemical treatment of bacterial infections in the salmon being held. The proposed Panther Creek intake screen would be a self-cleaning cone screen installed in a precast concrete structure, and would meet NMFS criteria for juvenile fish protection (National Marine Fisheries Service 2011). A 24-inch supply pipeline would route water from the intake screen to the fish holding tank along the west side of Panther Creek Road. Approximately 1,150 feet downstream of the intake, a 3 cfs duplex pump station would be constructed on the 24-inch pipeline to lift water into the acclimation ponds during the early spring. During the late summer to early fall adult return season, the pipeline would discharge into the holding tank. The water would pass through the holding pools and then collect into the fish ladder. The water would discharge back to Panther Creek through the ladder entrance. An 18-inch bypass pipe would allow up to 7 cfs of Panther Creek water to be routed directly to the fish ladder in order to increase the ratio of Dummy Creek water used in the holding pools. A small intake structure on Dummy Creek would consist of a screened intake in the bottom of the creek channel, wing wall abutments, and a cut-off wall to stabilize the right bank of the creek upstream of the diversion structure, and would meet NMFS criteria for juvenile fish protection (National Marine Fisheries Service 2011).
- **Juvenile Acclimation.** The acclimation of juvenile fish would occur in early spring at Panther Creek. Modular portable raceways or circular ponds would be utilized to receive juvenile fish, which would be trucked in from the hatchery for short-term acclimation and stress relief. The Panther Creek weir facility would be designed for up to 135,000 fish at 10 fish per pound. Water supply flows would be approximately 3 cfs at Panther Creek. Batches of fish would be acclimated and released every week or two until the stocking goals are met.
- **Pump Station and Valve Vault.** The lift station would be approximately 9 feet below existing grade and would pump water for the acclimation ponds.

# 3 Effects of the Proposed Action on Panther Creek

## 3.1 Alteration of Within-Channel Attributes of Panther Creek

### 3.1.1 Position of Proposed Activity

The Panther Creek weir will require construction activities within, and temporary and permanent modifications to, Panther Creek's banks and bed in a number of locations.

Temporary impacts on Panther Creek channel total 0.16 acres, and would include:

- Excavation of the west bank below the ordinary high water mark to construct the entrance and exit of the temporary diversion channel;
- Placement of soil bag coffer dams to isolate 0.10 acre of the channel in four locations to provide work areas for the bridge-supported weir/fish ladder, acclimation pond outfall, and upstream intake structure;
- Excavation within the existing streambed to install the water supply lines for the fish ladder, adult holding ponds and the spawning and egg preparation structure.

Permanent modifications to the Panther Creek channel would include the excavation of the streambed and both banks to install the pre-cast concrete sill, bridge-supported weir abutments (exemplified in Figure 9), fish ladder entrance, acclimation pond outfall, and the water supply inlet structure. These features would require the removal of riparian vegetation and the disturbance of the natural substrate of the channel. As part of this work, less than 0.01 acre of the cobble, gravel, sand, and mud would be removed from the channel and replaced with pre-cast concrete structures and riprap. Approximately 10 square feet of wetland would also be permanently impacted by the installation of the left (west) bank abutment.

**Figure 9. Example of permanent weir with abutments visible**

### 3.1.2 Anticipated Effects to Channel Location, Slope, Geometry, Form

With the application of the mitigation measures and design criteria and the small footprint of the impacts, these actions are expected to have little, if any substantial functional effect on Panther Creek, Dummy Creek (a small adjacent tributary), or to other downstream wetlands and waters. There would be no permanent effects to stream channel location, slope, geometry, or form, beyond the footprint of the weir itself.

### 3.1.3 Water Quality

Potential effects to water quality in Panther Creek are associated with runoff during facility construction and nutrients and suspended sediment in discharges from the facility during operations. The Proposed Action will not affect the quality of the river's water upstream from the facility.

Construction effects to water quality are discussed in detail in Chapter 3 of the EIS. The construction activities would likely degrade water quality for a short period of time, but mitigation measures and Best Management Practices would be in place to minimize this short-term effect. These short-term effects will not affect water quality to any degree that could disqualify this river from continued eligibility for future designation as a Wild and Scenic River.

The adult holding operations are also deemed to not impact water quality since fish will not be feeding (or fed) or producing wastes (see EIS, Chapter 3) that would be discharged into the river. The operation of the acclimation ponds, however, would include feeding, and water discharged from the ponds will therefore include some measure of fish waste. As described in Chapter 3, however, fish will be acclimated in batches and the discharged organic solids would not be highly concentrated.

Formalin use would be conducted according to EPA guidelines. Because the use of formalin 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.

### 3.1.4 Navigation of Panther Creek

This facility would prevent passage by recreational rafters and kayakers. These river users would have to take out and portage their gear approximately 300 feet around the facility. Panther Creek, however, is not frequently used by floaters for long trips down the river. When flows are adequate, short segments of Panther Creek (of which this in not one) are used for advanced kayaking, and others far downstream are used for rafting.

There would be low to no impact on navigation by recreation users.

## 3.2 Alteration of Riparian and/or Floodplain Conditions

### 3.2.1 Riparian Vegetation

The new facility will remove approximately 10 square feet of wetland vegetation and impact approximately 60 feet of streambank by installation of the abutments. These small amounts are of very little effect to stream function, floodplain function, fish and wildlife habitat, scenic and recreation values, etc.

### 3.2.2 Soil Properties

The soils at the new facility are composed of alluvial deposits forming a terrace landform that contains a diverse mixture of cobble, gravel, and sand-size material. The proposed development area is generally underlain by native alluvium consisting of dense silty gravel with sand and cobbles, with large cobbles and possibly small boulders encountered in test borings at depths of 15 to 20 feet (STRATA 2013). The erosion potential of the soil is considered low due to its overall coarse texture.

Construction of the new site facilities would result in conversion of existing native soil surfaces into hardened surfaces, which would result in the loss of soil resources. Most of the conversion would be due to the construction of gravel surfaces for the acclimation and adult holding areas. Additional conversion would be due to concrete poured for construction of portions of the holding area that do not use gravel.

The new facility would impact approximately 0.2 acres on the east side of Panther Creek where the abutment, fish ladder, holding tanks and other facilities will be located. On the west bank of Panther Creek it would remove less than 0.01 acre of the cobble, gravel, sand, and mud from the channel and replace it with pre-cast concrete structures and riprap for the abutment.

The acclimation tanks would be placed on a gravel surface that will impact approximately 0.2 acres of soil.

Together, they total approximately 0.5 acre of soil impact.

### 3.2.3 Floodplain Properties

The project site and Forest Service work center are located near the head of a small (16 acre) historical floodplain (Figure 10).[12] The work center occupies 2.5 acres of floodplain and the proposed weir and acclimation tanks would occupy an additional 0.31 acres. Together these facilities affect approximately 18% of this floodplain with structures, roadways, and associated hardened surfaces that reduce water infiltration and holding capacity. Within this 18% there are places with hardened surfaces (e.g. buildings, and roadways) where floodplain function is totally compromised, but the majority includes un-hardened surfaces (e.g., lawns and other unsurfaced areas) that still retain some level of floodplain function for infiltration and water holding capacity.

The new facility may hinder floodplain function with its removal of 10 square feet of wetland and the addition of some hardened surfaces, but the weir itself, by slowing the flow of water in flood conditions, could augment one function of floodplains: the slowing of flows.

The proposed bridge weir would create a backwater effect while operating with the bridge and picket panels deployed in the channel by increasing depths and reducing flow velocities. The backwater effect would reduce the sediment transport potential of Panther Creek in the affected reach upstream that could lead to sedimentation (a floodplain function and property). Since Panther Creek is a moderately steep channel, the backwater effect would be relatively minor and not extend far upstream. The physical barrier created by the weir would block sediment and debris coming downstream. These impacts would be most pronounced during high-flow events when the most sediment is transported by Panther Creek. The potential for the bridge weir to trap sediment and debris is most likely to occur during the high-flow months of late spring and early summer. Because of this, the bridge and picket panels would be rotated out of the channel during

[12] This "historical" floodplain is not the same as the "100-yr" floodplain mapped and discussed in the EIS. The "historical floodplain" is discussed here because it was considered more relevant to a Wild and Scenic Rivers discussion than the technical hydrologic definition, which limits discussion to current human-altered conditions.

high-flow months to an elevation 2 feet above the 100-year flood elevation, leaving only the weir sill and abutments in place. The precast concrete boxes that create the weir sill would be set approximately 8 feet into the channel bed with the tops aligned so they are approximately at grade with the existing substrate profile. Furthermore, a jib crane would be permanently installed adjacent to the bridge weir and would be used to remove debris from the weir that may accumulate during low-flow conditions. These measures would prevent the weir from creating a major flow obstruction that would lead to problematic sedimentation or debris accumulation. Any sediment deposited upstream of the weir during low-flow conditions will likely be quickly transported out of the reach with the return of higher flows.

Streambank stability, channel roughness, and erosion potential are expected to remain unchanged by the new facility.

Taken together, these impacts would likely not result in significant changes to floodplain capacity nor would they alter flood flows.

**Figure 10. Forest Service work center and proposed facility inraltation to floodplain**

## 3.3 Alteration of Upland Conditions

The entire weir and holding facility is located within the floodplain and riparian areas immediately adjacent to Panther Creek. Only the acclimation tanks are located in uplands across the road and to the west of Panther Creek. This site, however, is flat, immediately adjacent to the Panther Creek Road, and supports only a managed herbaceous plant community (a mowed field), with some upland forest trees and plants. This 0.18-acre site will be cleared and replaced with a gravel pad to support acclimation tanks.

## 3.4 Alteration of Hydrologic or Biological Processes

### 3.4.1 Ability of the Channel to Change Course, Re-occupy Former Segments, or Inundate Its Floodplain

Aerial photographs show very little lateral movement in the channel between 1998 and 2004. The channel is constrained by sections of riprap along its western bank, which parallels Panther Creek Road. No lateral movement and migration into the terrace feature along the channel's eastern bank is evident from the aerial photographs. Furthermore, the existing bridge a short distance upstream of the proposed weir would also limit channel migration in the vicinity. Future channel migration would be most likely to occur on the east bank, unconstrained by Panther Creek Road. Migration into the east bank could damage the proposed bridge weir abutments and make the weir non-functional.

### 3.4.2 Streambank Erosion Potential, Sediment Routing and Deposition, or Debris Loading

Streambank stability, channel roughness, and erosion potential are expected to remain unchanged by the new facility.

Under non-flood flows there would be no change to sediment routing or deposition. During flood flows, the weir may slow water velocities and some sediment may be deposited in amounts or locations different from what might occur in the weir's absence, though this effect is expected to be minimal and localized to the area near the weir.

There may be minor changes to debris loading as the weir may intercept some floating debris, which would be extracted with the jib crane and moved off site.

### 3.4.3 Amount and Timing of Flow

The Proposed Action will divert approximately 10 cfs of water from Panther Creek from June through September to support the adult holding ponds, and 3 cfs from April through June to support the acclimation ponds. This water would be diverted approximately 0.125 mile above the acclimation ponds. It would flow through the facility and be returned to the river through the fish ladder at the weir, for a total diversion length of about 0.25 mile.

Panther Creek flows at approximately 300 cfs in early June and drops about 35 cfs by mid-September.[13] The impact of 10 cfs in early June is minimal, but the effect by September is the removal of nearly one-third the water for a 0.25-mile stretch of the river (Figure 11). The Tribes may supplement 1 cfs from Dummy Creek during August and September for temperature regulation purposes, reducing this impact slightly. The effect of withdrawing between 20 and 30% of the flow from Panther Creek from mid-August through September, when stream temperatures are likely a concern can be expected to be measurable, visible, and impactful to the aquatic organisms in the 0.25-mile stretch affected.

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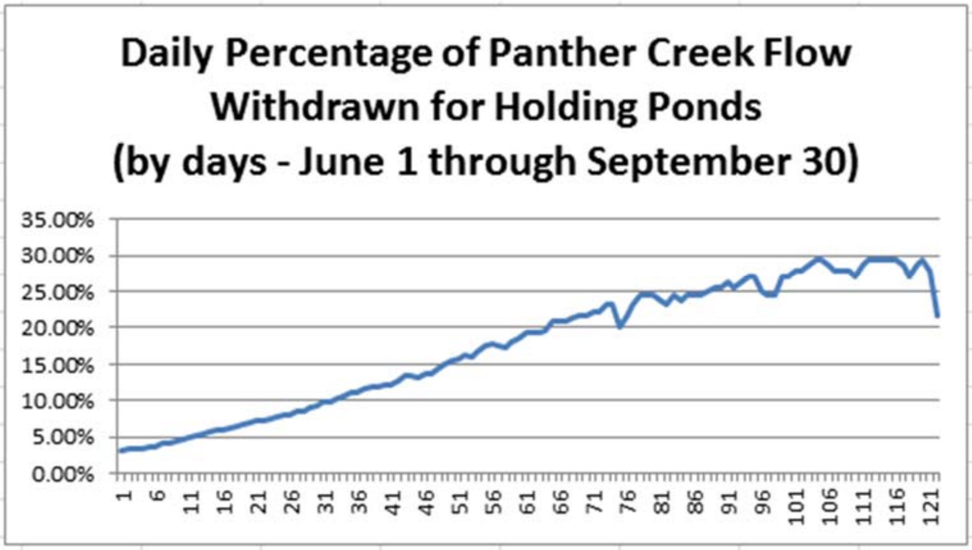
[13] USGS data from Panther Creek stream gauge near Cobalt October 2011 through September 2016 available at
http://waterdata.usgs.gov/usa/nwis/dvstat/?site_no=13306370&por_13306370_1=2549999,00060,1

**Figure 11. Daily Percentage of Flow withdrawn from Panther Creek for Holding Ponds**




Three cfs of water would be diverted to support the acclimation pond operations from April through June. Panther Creek is flowing from between 86 CFS to over 300 cfs during this period and this withdrawal amounts to only about 3%, with minimal if any effects to aquatic resources expected. In addition, this water would be discharged back into the river between the acclimation ponds and the weir, reducing the length of river affected by withdrawal.

These withdrawals would be non-consumptive; the water will be returned to the river below the facility with no measurable loss of volume. The impacts discussed above affect only 0.25 mile of the 45-mile-long Panther Creek eligible Wild and Scenic River.

### 3.4.4 Flood Storage (Detention Storage)

Approximately 0.5 acre of floodplain capacity would be compromised to some degree by the Panther Creek weir facility. This represents less than 2% of the 16-acre floodplain within which the facility is located, but only half of this area (1% of the floodplain) would likely be converted to a hardened surface with no filtration capability.

Only 10 square feet of wetland, with its floodwater storage capacity, would be lost.

### 3.4.5 Biological Processes

#### *3.4.5.1 Reproduction, Vigor, Growth and/or Succession of Streamside Vegetation*

The weir is located entirely within Panther Creek and the riparian area along its banks. The fish ladder and holding tanks are located within managed/mown pasturelands. The weir, its abutments, and a short segment of the fish ladder would, of course, permanently replace any riparian vegetation within its footprint, which would likely total less than 900 square feet. Approximately three times that amount would be disturbed during construction, but would be revegetated and full recovery to riparian vegetation conditions is expected.

#### *3.4.5.2 Nutrient Cycling*

Given the very small amount of streambed, bank, and riparian habitat altered there is expected to be very little if any impact on nutrient cycling within this stream. There would likely be an increase of nutrients during the spring acclimation period as fish waste from the tanks would be discharged into the creek. As discussed above, however, fish would be acclimated in batches and the discharged organic solids would not be highly concentrated to minimize adverse impact from this additional input.  The effect on nutrient cycling, if any, is expected to be localized, with no effect upstream or further downstream in Panther Creek.

#### *3.4.5.3 Fish Spawning and/or Rearing Success*

The project's construction and presence will have little effect on fish spawning or rearing, beyond the footprint of the weir itself.  The operation of the completed facility, however, can be expected to significantly aid in the recovery of ESA-listed spring/summer Chinook salmon in the Panther Creek watershed.

#### *3.4.5.4 Riparian Dependent Avian and Amphibian/Mollusk Species' Needs*

Given the very small amount of streambed, bank and riparian habitat altered there is expected to be very little impact on riparian dependent species.

## 3.5 Magnitude and Extent of Potential Off-Site Changes

As discussed above, there would be minimal changes and effects from this action on flow, hydraulics, and floodplain function for Panther Creek.  The scale of likely changes to the banks and channel is measured in fractions of an acre and well within the degree of change the river naturally experiences.  Flow of water would not be altered in either amount or timing.

There is thus no potential for physical effects to extend to other parts of the river system and no off-site changes as a direct result of this project other than a likely future increase in returning Chinook salmon in the Columbia, Snake, and Salmon Rivers.  This is not an adverse effect, but a desired condition that would support potential future Wild and Scenic River designation for Panther Creek.  The indirect effects of these restored runs would likely produce changes in wildlife populations (salmon being a ready food source that will attract and support more fish-eating wildlife to Panther creek than currently), recreation activity (fishing demand would likely increase along with camping, sightseeing, and recreation-based economic activity such as fishing guides, lodging and dining services on private lands, etc.).

## 3.6 Time Scale of Effects

There are two time scales to consider when evaluating effects of this facility.  First is the construction period, which is expected to occur in a single year during the low flow months of July through October.  The second period is long term, where the effects of facility operations must be considered.

Effects during the construction period are expected to be realized within a single year, with perhaps some residual effect during vegetative and physical 'recovery' of the site for perhaps two to five years thereafter.  Construction impacts and effects (vegetation impacts, turbidity, traffic, noise, etc.) to Wild and Scenic River values during this timeframe will be temporary, with the expectation that few (e.g. vegetation recovery) will be evident even one year following construction.

The operational effects, and those resulting for the presence of the facility, however, have no scheduled end.  These effects can include the minor localized effects on water quality and flow through the stream length of the facility, and significant improvements in fish populations.

The long-term, (timeless) goal of recovery of ESA-listed Chinook salmon is the overriding interest and focus when evaluating time-scale of effects from this project.

## 3.7 Project Effect on Wild and Scenic River Management Goals

### 3.7.1 Effects on Free Flow

#### *3.7.1.1 Water Diversion Effects*

See Section 3.4.3 for a discussion of the effects of water diversion on the flows of Panther Creek. There would likely be a high level of effect during low-flow periods for a distance of 0.25 mile in the vicinity of the Forest Service work center as this stretch can have up to one third of its flow diverted. This effect is substantial, but limited in time (late summer) and space (only the area near the work center), as all water diverted is ultimately returned to Panther Creek below the facility.

#### *3.7.1.2 Weir Effects*

The project would not change the free-flowing character of the river downstream or upstream from the facility. There are no impoundments, and no straightening or redirection of the river. There is, however, the introduction of abutments on each riverbank, and a narrow slab across the riverbed with temporary/ removable screening sufficient to trap fish during migration periods. The expectation is that the weir would be operating (blocking fish passage) from June through September. It will not be blocking river passage by fish yearlong.

#### *3.7.1.3 Allowance for Structures in Recreation Wild and Scenic Rivers*

The Act allows for "minor structures at the time any river is proposed for inclusion in the Wild and Scenic River System." For these segments, that time of *formal proposal* has not yet arrived. These segments have been found *eligible*, but a *suitability determination* (which must precede a *proposal*) has not yet been made, so full protection from structures is not yet required. Additionally, the scale of the structures considered here is consistent with the scale of structures discussed as being allowable for rivers proposed for designation under the 'Recreation' category (Forest Service Handbook 1909.12 8.2).

Thus, construction of this facility does not automatically compromise this segment's eligibility for Wild and Scenic River designation. The deciding official can consider whether the in-stream structures proposed here can be authorized in this decision and likely fit the category of 'minor' allowable structures that would not compromise the free flowing characteristics of the river at the time it is formally proposed, if ever.

The Wild and Scenic Rivers Act makes clear, however, that such allowance for structures "*shall not be construed to authorize, intend, or encourage future construction of such structures within components of the national wild and scenic rivers system.*"[14] While this only applies to rivers within the system, the intent appears clear, when considered alongside the protective intent of Forest Service policy, that such allowance not be construed as liberty to construct. Nonetheless, as discussed below, these structures are intended solely to enhance ***Fish***, a critical ORV for this river. Additionally, the structures are intended for removal once species have fully recovered; they are not intended to be there in perpetuity, as is the designation of a Wild and Scenic River. Therefore, a case for responsibly considering and approving these structures can be made.

### 3.7.2 Effects on Water Quality

As discussed in Section 3.1.3, potential effects to water quality in Panther Creek are associated with runoff during facility construction (temporary effects); and nutrients and suspended sediment in discharges from the facility during operations (long term effects).

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[14] 16 U.S.C. 1286(b).

The Proposed Action will not affect the quality of the river's water upstream from the facility.

Water quality will be slightly affected by fish waste from the acclimation ponds in the spring and from low levels of formalin used during summer trapping, holding, and breeding activities. These effects are minimal, localized, and of short duration. Their effects will be limited to the facility location and for short distances downstream. The effect is low and may be noticeable over less than 1% of the 45-mile length of Panther Creek. It would not constitute a significant adverse impact on the 'water quality' qualifying criterion for Panther Creek and its continued eligibility under this criterion is not affected.

### 3.7.3 Effects on Floodplain Conditions

There is minimal effect on floodplain conditions with no anticipated effect on floodplain function and the creek's ability to store and move floodwaters. As discussed above, the project does not redirect, channel, or block the creek beyond its current condition. Wetland storage capacity for floodwaters will be reduced by less than 10 square feet.

### 3.7.4 Effects on ORVs

#### *3.7.4.1 Effect of the Proposed Action on the Scenery ORV*

The primary impact of this proposal is the erection of a modern, industrial-appearing facility on the river adjacent to an historical Forest Service work center. Though its buildings and facilities would be painted and textured to be consistent with the existing work center as much as possible, it will still be evident as concrete structures, metal buildings, and chain link fencing and these features are inconsistent with the intent of Wild and Scenic River designation.

The scale of development is small, however, and it is located in a relatively confined canyon where it would not mar background scenery consistent with the values for which ***Scenery*** was identified as an ORV. Additionally, travelers along the Panther Creek Road are likely to be visually attracted to the human developments here as points of interest, rather than to natural features. The industrial appearance, however, will be evident and likely not a compliment to the site. However, interpretive signage explaining the purpose and function of the facility might possibly turn this potential scenic detriment into a positive recreational, point-of-interest asset.

With or without interpretive signage, the eligibility of the river for future consideration as a Wild and Scenic River is not compromised given the scale of the facility, its proximity to existing development, its location within the canyon, and the allowance of Recreation Wild and Scenic Rivers for some level of development and structures.

#### *3.7.4.2 Effect of the Proposed Action on the Recreation ORV*

The Proposed Action's only impact on recreation will be in the immediate location of the facility. It will not change the flow of the river downstream nor upstream of the facility, so recreation opportunities would not be affected below or above it. Activities dependent on river flow such as fishing and swimming, etc. will be hampered during the late summer given the operation's impact on flows, but again, this is only within the 0.25 mile between the water diversion's intake and the weir.

Kayaking and rafting is likely an uncommon recreational pursuit in this reach, and limited, of course, to those times of year with adequate flow. As mentioned in Section 1.2.2 above, Panther Creek is used by whitewater kayakers primarily below Trapper Flat, approximately 7 miles downstream of the proposed Panther Creek weir facility. The weir, however, is a barrier and will require floaters that might use this reach to stop and haul their craft around it.

The proposed facility is designed to restore Chinook salmon runs to Panther Creek, and while the facility may detract from recreational values in the short and mid-term, its resulting long-term impact, as salmon are restored, will have a highly positive effect on recreation. Salmon fishing is extremely popular where fish populations and regulations allow it, and that is ultimately the goal here: to restore salmon sufficient to restore Tribal/cultural and recreational fishing opportunities.

Panther Creek was found eligible under the ***Recreation*** category for Wild and Scenic Rivers that, according to Forest Service Handbook 1909.12.8.2 for designated rivers allow for existing minor instream structures (low-head dams, diversions, rip rap etc.) but prohibits new structures and developments. These segments are not yet designated, nor yet assessed for their suitability (see distinctions under "***Free Flowing***" above). As such, constructing the facility at this time may not be prohibited by Forest Service policy and may not compromise continued eligibility of this Segment especially considering its long-term goals. In addition, by including improvements and mitigation for river-based recreational use at the site (by providing user-friendly portage, and signage for safety and site interpretation), the facility can be made to appropriately accommodate various recreation users in the near term such that a future suitability determination might not find the site wholly inconsistent. While there would be impacts on the ***Recreation*** ORV, the effects of those impacts do not necessarily disqualify this River from continued eligibility for future Wild and Scenic River designation.

#### *3.7.4.3 Effect of the Proposed Action on the Geology ORV*

The geology of the area will not be affected by the construction of a weir and its associated facilities along Panther Creek. People's view of the geology in the canyon above or below the proposed development will not be affected. The only possibility for effect would be at the site, and as noted in the ***Scenery*** description above, this location does not include any geologic features that the Forest Service likely recognized as outstandingly remarkable when Panther Creek was determined eligible for Wild and Scenic River consideration.

There is no adverse effect on the ***Geology*** ORV as it relates to the eligibility determination for this river.

#### *3.7.4.4 Effect of the Proposed Action on the Fish ORV*

The sole purpose of this facility is to restore anadromous fisheries resources within the Panther Creek drainage. In the long term, therefore, this action will be entirely beneficial to the ***Fish*** ORV.

The effects on fish (see EIS, Chapter 3) from this proposal are variable depending on the species and/or the timeframe considered. Adverse effects to fish may be expected during construction of the weir and its attendant facilities and there may be some adverse effect to bull trout, which have benefitted in the absence of Chinook salmon. There would be localized adverse impacts during late summer when flows above the facility will be reduced by up to one third. The overriding effect of this proposal, however, is an expected restoration of threatened Chinook salmon runs sufficient to support Tribal and recreational fishing in the future. This is a beneficial effect on this ORV and strengthens this river segment's eligibility for future designation.

For the purposes of this assessment, it is important to recognize that salmon restoration efforts and their attendant facilities, such as this project, are intended to be temporary until fish runs are restored. 'Temporary' in this context may mean many decades, but the intention is that these artificial means of re-establishing and supporting fish runs would ultimately become unnecessary as native and naturalized populations provide all the reproduction and escapement necessary to maintain populations at desired levels. From a Wild and Scenic Rivers perspective, this translates into acceptable short and medium-term impacts for long-term gains.

The Proposed Action does not adversely affect the ***Fish*** ORV to any degree that would adversely affect Panther Creek's continued eligibility as a Recreation Wild and Scenic River.

#### *3.7.4.5 Effect of the Proposed Action on the Wildlife ORV*

As discussed under the other ORVs above, the impacts on ***Wildlife*** will occur only at the immediate site of the Proposed Action. These effects are discussed in Chapter 3 of the EIS.

The ***Wildlife*** ORV, however, is a focus on wildlife viewing: primarily big game, raptors and other birds and mammals that people find uncommon. Big game viewing opportunities (other than resident deer) are likely few in the Proposed Action's site given the nature of the landscape, its habitat, and the presence of human activity. Local birds, small mammals and resident deer are most likely what can often be seen here.

The operating facility, however, will attract wildlife that people enjoy viewing. Species such as king fisher, great blue heron, osprey, raccoon, otter, and perhaps bears will likely be attracted to the weirs, fish ladder, and holding ponds because of the ready food source (fish).

In the canyon above and below the facility, there will be no adverse impact on wildlife viewing opportunities. In the long term, however, with restored fish runs, an increase in wildlife viewing opportunities is anticipated. Running salmon are a sight themselves, and their runs may attract otters, bears, raccoons, osprey, eagles, and even wolves, increasing the opportunity for people to see them as they travel Panther Creek Road. The success of this facility will increase the value of ***Wildlife*** as an ORV much as it would the ***Fish*** ORV in the long term.

### 3.7.5 Effects on River Classification

The classification of Panther Creek as eligible for designation as a "Recreation" river under the Wild and Scenic Rivers Act would be unchanged. The effects would not be sufficient to disqualify its potential as a "Recreation" river, as there is no lesser designation. The benefits from the Proposed Action are insufficient to elevate Panther creek for consideration as either a "Scenic" or a "Wild" river under the Act.

# 4 Determination

The installation of a permanent fish-trapping weir as proposed for Panther Creek in this Proposed Action will not nullify its eligibility for designation as a Recreation Wild and Scenic River. As discussed above, the effects to the river's free-flowing nature, water quality, and floodplain function would be low.

The Recreation ORV would be the most affected by the construction of this industrial-appearing facility and its effects on scenery and on-site river recreation. Facilities of this scale, however, are acceptable (prior to the Tribes' proposal) within rivers proposed as Recreation Wild and Scenic Rivers, and mitigation such as interpretive and safety signage, and safe accommodations for portage, might effectively override other concerns associated with the river-spanning weir or visual impacts.

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# Appendix E
Assumptions Used to Calculate Greenhouse Gas Emissions and Detailed Results

# Appendix E
# Assumptions Used to Calculate Greenhouse Gas Emissions and Detailed Results

Implementation of the Crystal Springs Hatchery Program (Hatchery Program) could contribute to an increase in greenhouse gas concentrations through the activities described in this appendix. The assumptions and methods used to determine the Hatchery Program's contribution to greenhouse gas levels, as well as detailed results, are described in the following sections.

## Assumptions

The assumptions and methods used to calculate greenhouse gas emissions for construction and operation of the Hatchery Program are described in the sections that follow.

### Construction

Project construction for Alternative 1 and Alternative 2, including both the full production and 50% production options, would take approximately 18 months, with peak construction activity, including road and structure installation, occurring during a 14-month-long period. Yankee Fork and Panther Creek weir sites would each take approximately 4 months to complete within the peak construction timeframe. Non-peak construction activities would include installing and removing best management practices, site preparation, establishing staging areas, moving equipment and materials into and out of the project area, and restoration work. Most non-peak construction work would occur at the Crystal Springs hatchery site.

The transportation components of greenhouse gas emissions were estimated based on the approximate number of vehicles that would be used during project construction and the approximate distance those vehicles would travel. Greenhouse gas emissions were calculated for both the 14-month-long peak construction period and the 4-month-long non-peak construction period.

Overestimating the number of round trips ensures that greenhouse gas emissions estimates are conservatively high. The number of round trips was deliberately overestimated using the following assumptions:

- All workers would travel in separate vehicles to the project area each day.
- A maximum number of workers would be required to construct the Hatchery Program.
- Fuel consumption is based on the average fuel economy for standard pickup trucks of 17 miles per gallon (EPA 2013a). Again, this is likely an overestimation as more efficient vehicles may be occasionally used.

Up to 30 construction workers would work on the hatchery and weir facilities during the peak construction period (14 months) and an estimated 10 workers would be present during the non-peak construction period (4 months).

Tribal staff would travel to the Crystal Springs hatchery and weir sites for various purposes, such as road inspection, work inspection, staff meetings, environmental compliance monitoring, and meetings with landowners. Staff would travel an estimated one round trip every week from Fort Hall, Idaho to each of the remote weir sites on Yankee Fork and Panther Creek, and three round trips every week to the hatchery site near Springfield during the 18-month-long construction period. Travel to the Yankee Fork site would result in a total of 16 round trips at an estimated 380 miles per trip. Travel to the Panther Creek site would result in a total of 16 round trips at an estimated 462 miles per trip. Travel to the Crystal Springs hatchery site would result in 216 round trips at an estimated 60 miles per trip.

Fuel consumption and greenhouse gas emissions would also result from operation of on-site heavy construction equipment. Heavy construction equipment may include augers, bulldozers, excavators, graders, heavy-duty trucks, and front-end-loaders. Similar to the transportation activities described above, increased use of heavy construction equipment would occur during peak construction.

Greenhouse gas emissions associated with equipment operation were overestimated to account for all potential construction activities and associated material deliveries to and from the construction site. Although it is difficult to develop an accurate estimation of total fuel consumption associated with heavy construction equipment operation, the following assumptions were used:

- A maximum of 6 pieces of equipment would be in operation during peak and non-peak construction.
- The average size of the equipment would not exceed 250 horsepower. All equipment would operate at maximum power for 8 hours per day and 5 days per week throughout the construction phase. This is an overestimation because equipment commonly operates in idle or at reduced power.
- Equipment would operate at approximately 35% efficiency, representing the percentage of productive energy extracted from the diesel fuel relative to the maximum potential energy within the fuel (i.e., 128,450 British thermal units per gallon of diesel) (AFDC 2013).

# Operation

Normal hatchery operations would include four off-site employees who would drive to and from the Crystal Springs hatchery daily, seven days a week (44 miles round trip). Crystal Springs hatchery employees would drive off-site once per day for supplies (44 miles round trip). At the Yankee Fork and Panther Creek weir facilities, one truck would bring one or two employees to each of the facilities where they would stay for a four-day period (40 miles and 65 miles round trip, respectively). Yankee Fork employees would make one 40-mile round trip per day for supply runs (one round trip per week employee travel, four round trips per week for supply runs). Total employee trips during operation at Panther Creek would be one 65-mile round trip per day for daily supply runs (one round trip per week employee travel, four round trips per week for supply runs). Trip distances are based on the nearest locality for each facility.

# Detailed Results

The greenhouse gas emissions, or storage loss, are quantified below for each type of activity described above.

## Construction Emissions

Table E-1 displays the results of calculations for the construction activities that would contribute to greenhouse gas emissions. Construction of the Hatchery Program would result in an estimated 5,916 metric tons of $CO_2e$[1] emissions for the 18-month construction period, or 3,944 metric tons of $CO_2e$ in the first year of construction.

**Table E-1. Estimated Greenhouse Gas Emissions from Construction Activities**

| Estimated Greenhouse Gas Emissions from Construction Activities | $CO_2$ (metric tons) | $CH_4$ ($CO_2e$)[a,b] (metric tons) | $N_2O$ ($CO_2e$)[b] (metric tons) | Total $CO_2e$ (metric tons)[c] |
|---|---|---|---|---|
| Peak construction transportation | 542 | 438.3 | 2,040.4 | 3,020.7 |
| Off-peak construction transportation | 51.6 | 41.7 | 194.3 | 287.7 |
| Tribal employee transportation | 15 | 12.1 | 56.3 | 83.4 |
| Peak construction equipment operation | 2,103.8 | 2.6 | 13.5 | 2,120.0 |
| Off-peak construction equipment operation | 400.7 | 0.5 | 2.6 | 403.8 |
| **Total**[c] | **3,113.2** | **495.3** | **2,307.1** | **5,915.5** |

Notes:
$CO_2$ = carbon dioxide
$CH_4$ = methane
$N_2O$ = nitrous oxide
$CO_2e$ = units of equivalent carbon dioxide
a. Carbon dioxide emissions factors calculated from The Climate Registry (2014).
b. Methane and nitrous oxide emissions have been converted into units of equivalent carbon dioxide (CO2e ) using the Intergovernmental Panel on Climate Change global warming potential (GWP) factors of 25 GWP for methane and 298 GWP for nitrous oxide (The Climate Registry 2014).
c. The sum of the individual entries may not sum to the total depicted due to rounding.

[1] $CO_2e$ is a unit of measure used by the Intergovernmental Panel on Climate Change that takes into account the global warming potential of each of the emitted greenhouse gases using global warming potential factors. See Table E-1.

# Operation Emissions

Table E-2 displays the contribution to greenhouse gas emissions that would result from operation of the new hatchery and weir facilities through the life of the Hatchery Program (assumed 50 years). Facility operation would result in an estimated 285.5 metric tons of $CO_2e$ emissions annually.

**Table E-2. Estimated Greenhouse Gas Emissions from Operation of New Hatchery and Weir Facilities**

| Type of Activity | $CO_2$ (metric tons) | $CH_4$ ($CO_2e$) (metric tons) | $N_2O$ ($CO_2e$) (metric tons) | Total $CO_2e$ (metric tons)[a] |
|---|---|---|---|---|
| Worker travel and supply runs: Crystal Springs hatchery | 2,097.7 | 662.5 | 7,896.7 | **10,656.9** |
| Worker travel and supply runs: Panther Creek weir facility | 441.5 | 139.4 | 1,661.9 | **2,242.8** |
| Worker travel and supply runs: Yankee Fork weir facility | 271.7 | 85.8 | 1,022.7 | **1,380.2** |
| **Total[a]** | **2,810.8** | **887.7** | **10,581.4** | **14,279.9** |

Notes:
$CO_2$ = carbon dioxide
$CH_4$ = methane
$N_2O$ = nitrous oxide
$CO_2e$ = units of equivalent carbon dioxide
a. The sum of the individual entries may not sum to the total depicted due to rounding.

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# Appendix F
NEPA Disclosure Statement

**NEPA DISCLOSURE STATEMENT FOR PREPARATION OF THE**
**Crystal Springs Hatchery Program**
**Draft Environmental Impact Statement**
**DOE/EIS-0500**

CEQ Regulations at 40 CFR 1506.5(c), which have been adopted by the DOE (10 CFR 1021), require contractors who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial interest or other interest in the outcome of the project" for purposes of this disclosure is defined in the March 23, 1981 guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 8026-18038 at Question 17a and b.

"*Financial or other interest in the outcome of the project*" includes "*any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)*." 46 FR 18026-18038 at 18031.

In accordance with these requirements, the offeror and any proposed subcontractors hereby certify as follows: (check either (a) or (b) to assure consideration of your proposal).

(a) ___X___ Offeror and any proposed subcontractor have no financial or other interest in the outcome of the project.

(b) ________ Offeror and any proposed subcontractor have the following financial or other interest in the outcome of the project and hereby agree to divest themselves of such interest prior to award of this contract.

Financial or Other Interests

1.
2.
3.

Certified by:

Amanda A. Mulhern

*Signature*

Amanda A. Mulhern Contracts Administrator

*Printed Name and Title*

ICF Jones & Stokes, Inc.

*Company*

7/15/2016

*Date*

BONNEVILLE POWER ADMINISTRATION
DOE/BP-4791 0500 – May 2017