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

IN COOPERATION WITH THE BUREAU OF LAND MANAGEMENT

Lolo Creek

Permanent Weir and Fish Trapping Facility

Preliminary Environmental Assessment

October 2012

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Table of Contents

CHAPTER 1 INTRODUCTION 1-1

1.1 Need for Action 1-1

1.2 Purposes 1-3

1.2.1 BPA Purposes 1-3

1.2.2 BLM Purposes 1-3

1.3 Project Background 1-3

1.3.1 Northwest Power and Conservation Council Process 1-3

1.3.2 Federal Columbia Power System Biological Opinion 1-3

1.3.3 Spring Chinook Supplementation 1-4

1.3.4 Special Designations 1-4

1.4 Existing Conditions at the Lower Lolo Weir Site 1-4

1.4.1 Existing Facilities 1-4

1.4.2 Existing Operations and Maintenance at the Lower Lolo Weir Site 1-5

1.5 Scoping, Public Involvement, and Issues 1-7

CHAPTER 2 ALTERNATIVES 2-1

2.1 Proposed Action – Permanent Fish Weir with Recreation Elements 2-1

2.1.1 Permanent Fish Weir Construction and Operations 2-7

2.1.2 Public Recreational Facilities 2-15

2.1.3 Environmental Design Features/Mitigation Measures Included as Part of the Proposed Action 2-15

2.1.4 Site Reclamation 2-21

2.2 No Action Alternative 2-21

2.3 Alternatives Considered but Eliminated from Detailed Study 2-21

2.3.1 Alternate Weir Locations 2-21

2.4 Comparison of Alternatives 2-22

CHAPTER 3 AFFECTED ENVIRONMENT, EFFECTS OF ALTERNATIVES, AND MITIGATION MEASURES 3-1

3.1 Introduction 3-1

3.2 General Setting 3-2

3.3 Aquatic Habitat and Special Status Species 3-2

3.3.1 Affected Environment 3-2

3.3.2 Environmental Effects 3-9

3.4 Water Resources 3-17

3.4.1 Affected Environment 3-17

3.4.2 Environmental Effects 3-17

3.5 Vegetation and Wetlands 3-19

3.5.1 Affected Environment 3-20

3.5.2 Environmental Effects 3-25

3.6 Terrestrial Wildlife Habitat and Special Status Species 3-27

3.6.1 Affected Environment 3-29

3.6.2 Environmental Effects 3-32

3.7 Special Designations - Area of Critical Environmental Concern and Wild and Scenic River System 3-35
3.7.1 Affected Environment 3-35
3.7.2 Environmental Effects 3-35
3.8 Recreation 3-36
3.8.1 Affected Environment 3-36
3.8.2 Environmental Effects 3-39
3.9 Transportation 3-40
3.9.1 Affected Environment 3-40
3.9.2 Environmental Effects 3-43
3.10 Visual Quality and Aesthetics 3-44
3.10.1 Affected Environment 3-44
3.10.2 Environmental Effects 3-45
3.11 Cultural Resources 3-46
3.11.1 Affected Environment 3-47
3.11.2 Environmental Effects 3-50
3.12 Cumulative Effects 3-50
3.12.1 Introduction 3-50
3.12.2 Aquatic Habitat and Special Status Species 3-52
3.12.3 Water Resources 3-53
3.12.4 Vegetation and Wetlands 3-54
3.12.5 Terrestrial Wildlife Habitat and Special Status Species 3-54
3.12.6 Special Designations - Area of Critical Environmental Concern and Wild and Scenic Rivers 3-54
3.12.7 Recreation 3-55
3.12.8 Transportation 3-55
3.12.9 Visual Quality and Aesthetics 3-55
3.12.10 Cultural Resources 3-55
3.13 Mitigation and Monitoring 3-56
CHAPTER 4 ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS 4-1
4.1 Relationship to Laws, Policies, and Land Use Plans 4-1
4.1.1 National Environmental Policy Act 4-1
4.1.2 Federal Land Policy and Management Act 4-1
4.1.3 Americans with Americans with Disabilities Act 4-2
4.1.4 Fish and Wildlife 4-2
4.1.5 Water Resources 4-4
4.1.6 Lacey Act and Plant Protection Act 4-5
4.1.7 National Wild and Scenic Rivers System 4-5
4.1.8 Cultural and Historical Resources 4-5
4.1.9 Noise and Public Health and Safety 4-6
4.1.10 Executive Order on Environmental Justice 4-6
4.1.11 Air Quality 4-6
4.1.12 Climate Change 4-7
4.1.13 Farmland Protection Policy Act 4-7
4.1.14 Hazardous Materials 4-7
4.1.15 State 4-8
4.1.16 Local 4-8

CHAPTER 5 EA DISTRIBUTION AND PREPARERS LIST 5-1
5.1 Distribution 5-1
5.2 Preparers 5-1
CHAPTER 6 GLOSSARY 6-1
CHAPTER 7 REFERENCES 7-1

Appendix A Project Site Photographs
Appendix B Wild and Scenic River Section 7 Analysis
Appendix C Wetland and Stream Delineation Report
Appendix D Cottonwood Resource Management Plan Conformance

List of Tables

Table 2-1. Environmental Design Features / Mitigation Measures Included as Part of the Proposed Action. 2-16
Table 2-2. Comparison of the Proposed Action and No Action Alternative, and Methods by Which they Meet the Purposes of the BPA and the BLM 2-23
Table 2-3. Summary of Impacts of the Proposed Action and No Action Alternative. 2-25
Table 3-1. Mean Monthly Instream Temperatures from August - October, as Measured at the NPT Gage on the Lolo Creek Road/Woodland Bridge. 3-3
Table 3-2. Lolo Creek Average Monthly Flows (cfs) as Measured at Lolo Creek Road/Woodland Bridge (2005-2009). 3-4
Table 3-3. Timing of ESA-Listed and Several BLM-Sensitive Species in Lolo Creek. 3-5
Table 3-4. Idaho State Sensitive Plant Species. 3-23
Table 3-5. BLM Sensitive Species (Plants) - Cottonwood Field Office Area. 3-23
Table 3-6. BLM Sensitive Species (Mammals) - Cottonwood Field Office Area. 3-30
Table 3-7. BLM Sensitive Species (Birds) - Cottonwood Field Office Area. 3-31
Table 3-8. BLM Sensitive Species (Reptiles and Amphibians) - Cottonwood Field Office Area. 3-32

List of Figures

Figure 1-1. Vicinity Map. 1-2
Figure 1-2. Existing Facilities at Lower Lolo Creek Weir Location, with Right of Way Polygon Shown. 1-6
Figure 2-1. Rendering of Permanent Fish Weir with Recreation Elements. 2-2
Figure 2-2. Photographs of the Similar Weir and Fishway/Trap in Lostine, Oregon (Recently constructed facility, immediately post-construction, plantings not yet established along banks). 2-3
Figure 2-3. Proposed Site Plan. 2-5
Figure 2-4. Cross Sections of Proposed Weir Facility. 2-6
Figure 2-5. Instream Isolation Plan, Showing North Bank Culvert Bypass. 2-12
Figure 3-1. Vegetation Communities and Wetlands within the Project Analysis Area. 3-22
Figure 3-2. Terrestrial Wildlife Habitat and Special Status Species Analysis Area. 3-28
Figure 3-3. Recreation Use and Features. 3-38
Figure 3-4. Transportation Analysis Area. 3-41
Figure 3-5. Transportation Access in the Greater Vicinity. 3-42
Figure 3-6. National Historic Trails in the Project Area. 3-49

Acronyms and Abbreviations

ACEC	Area of Critical Environmental Concern
ADA	Americans with Disabilities Act
APE	Area of Potential Effect
BA	Biological Assessment
BLM	Bureau of Land Management
BMPs	Best Management Practices
BPA	Bonneville Power Administration
°C	Degrees Celsius
CBBTTAT	Clearwater Basin Bull Trout Technical Advisory Team
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second
CNF	Clearwater National Forest
CWA	Clean Water Act
CWMA	Cooperative Weed Management Area
DOE	U.S. Department of Energy
DPS	Distinct Population Segment
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
°F	Degrees Fahrenheit
FCRPS	Federal Columbia River Power System
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
HDR	HDR Engineering, Inc.
HSRG	Hatchery Scientific Review Group
IDAPA	Idaho Administrative Procedures Act
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IDL	Idaho Department of Lands
IDWR	Idaho Department of Water Resources
ISDA	Idaho State Department of Agriculture
LWD	Large Woody Debris
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPCC	Northwest Power and Conservation Council
NPT	Nez Perce Tribe
NPTH	Nez Perce Tribal Hatchery
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Unit
NWSRS	National Wild and Scenic River System
O&M	Operations and Maintenance
OHWM	Ordinary High Water Mark

ORVs	Outstandingly Remarkable Values
PIT	Passive Integrated Transponder
RCA	Riparian Conservation Area
RM	River Mile
RMP	Resource Management Plan
ROW	Right of Way
SHPO	State Historic Preservation Office
SRMA	Special Recreation Management Act
TMDL	Total Maximum Daily Load
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Society
VRM	Visual Resource Management

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Chapter 1
Introduction

The Bonneville Power Administration (BPA) is proposing to fund the Nez Perce Tribe's (NPT's) proposal to replace a seasonally-installed fish collection **weir**[1] (referred to as the Lower Lolo Weir) with a permanent weir and fish trapping facility in Lolo Creek, a tributary to the Clearwater River in north-central Idaho. The proposal would include construction of a permanent weir to block upstream fish passage; a fish trapping facility to allow for fish collection; a work shelter; a mechanical building; and riparian habitat restoration. The project site is located on federal land managed by the Bureau of Land Management (BLM) in Clearwater and Idaho counties (Boise Meridian, T. 34 N., R. 4 E., sec. 17, NE¼NE¼) (Figure 1-1). Upgrades to public recreational amenities at the project site would also be constructed; these upgrades would be funded in part by the BLM, BPA, and the NPT.

This Environmental Assessment (EA) was prepared by BPA, in cooperation with the BLM, pursuant to regulations implementing the National Environmental Policy Act (NEPA) (42 U.S. Code [USC] 4321 *et seq*.), which requires federal agencies to assess the effects their actions may have on the human environment. This EA was prepared to determine if the proposal would cause effects of a magnitude that would warrant preparing an Environmental Impact Statement (EIS), or whether it is appropriate to issue a Finding of No Significant Impact (FONSI).

1.1 Need for Action

BPA needs to decide whether to provide funding to the NPT for its proposal to replace the existing Lower Lolo Weir with a permanent weir and fish trapping facility that will enhance fish monitoring and data collection in the Lolo Creek drainage area. The permanent weir would replace an existing seasonal, temporary fish collection facility that the NPT has operated since 2002. The existing system has limited effectiveness and durability, and cannot be used during high flows that occur during the spring. For these reasons, the existing seasonal weir cannot be used to monitor Lolo Creek steelhead (*Oncorhynchus mykiss*) populations, which are federally-listed under the Endangered Species Act (ESA).

In accordance with the Federal Land Policy and Management Act (FLPMA), BLM needs to decide whether to amend the NPT's existing seasonal weir right-of-way (ROW) to accommodate the permanent weir and associated facilities.

[1] Words in bold are defined in the glossary, Chapter 6

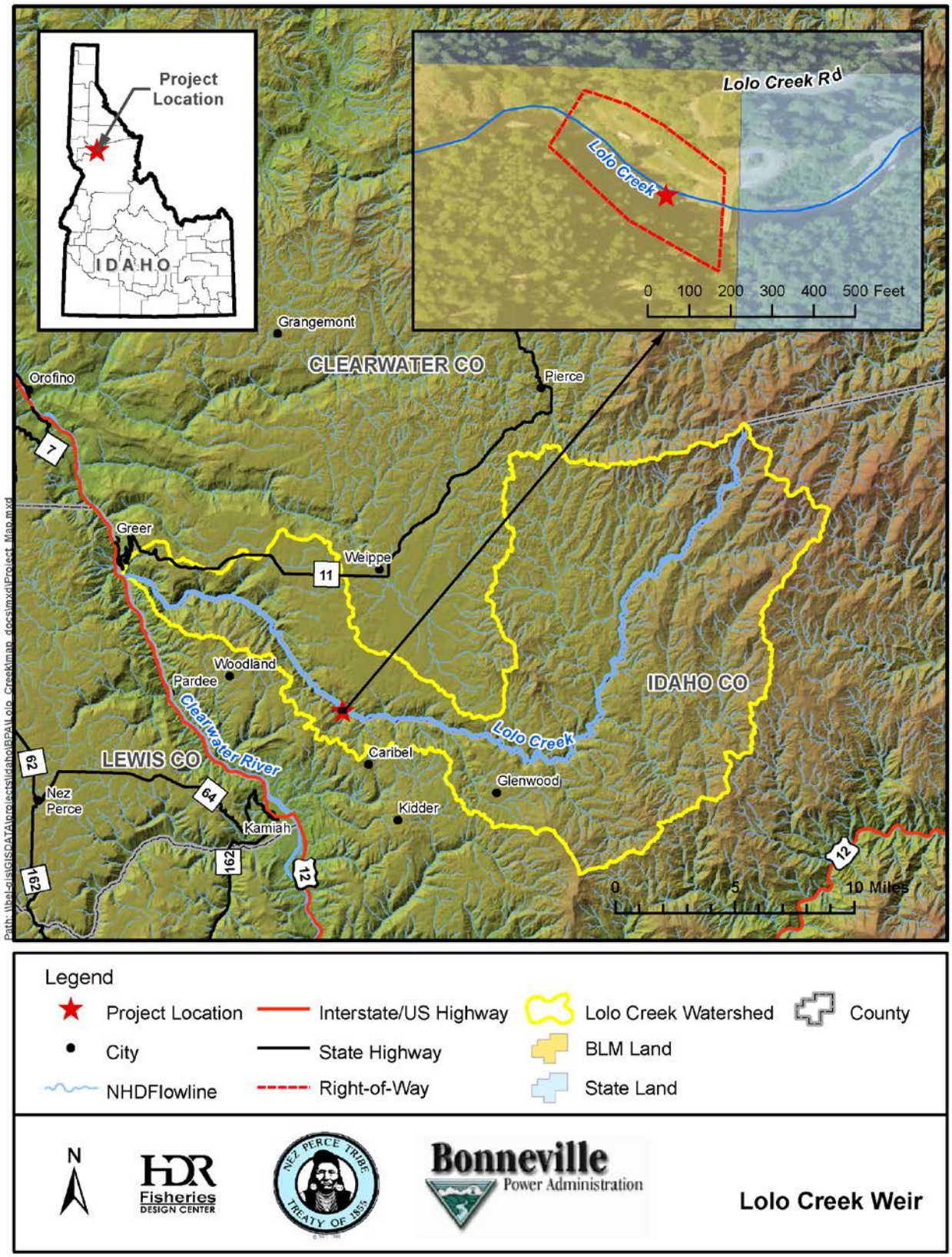

Figure 1-1. Vicinity Map.

1.2 Purposes

In meeting the need for action, BPA and BLM will attempt to achieve the following purposes and use them to evaluate the alternatives considered in the EA.

1.2.1 BPA Purposes

- Act consistently with all applicable federal laws, regulations, and policies that guide the agency;
- Support efforts to mitigate for effects of the Federal Columbia River Power System (FCRPS) on fish and wildlife in the mainstem Columbia River and its tributaries, pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839b(h)(10)(A));
- Seek to fulfill commitments to implement the pertinent Reasonable and Prudent Alternatives (No. 50.5) listed for Snake River B-run steelhead in the 2008 FCRPS Biological Opinion, as amended by a Supplemental Biological Opinion in 2010 (NMFS 2008; 2010). Specifically, "provide additional status monitoring to ensure a majority of Snake River B-Run steelhead populations are being monitored for population productivity and abundance";
- Minimize environmental effects; and,
- Act in a cost-effective manner.

1.2.2 BLM Purposes

- Act consistently with all applicable federal laws, regulations, and policies that guide the agency, including the Endangered Species Act, Federal Land Policy and Management Act, National Wild and Scenic Rivers Act, and Clean Water Act;
- Support the ongoing supplementation program for spring Chinook salmon by the NPT;
- Ensure that the construction and NPT's operation of the weir does not measurably alter the Outstandingly Remarkable Values of Lolo Creek; and,
- Maximize benefits while minimizing adverse environmental effects to water quality and aquatic resources, and allow for recreational users to continue enjoying the benefits of Lolo Creek.

1.3 Project Background

1.3.1 Northwest Power and Conservation Council Process

The NPT currently operates a seasonal fish collection facility at the proposed project site and proposes to replace it with a permanent facility using funding from BPA. BPA is a federal power marketing agency that is part of the U.S. Department of Energy (DOE). BPA's operations are governed by several statutes, including the Northwest Power Act. Among other things, this Act directs BPA to protect, mitigate, and enhance fish and wildlife affected by the development and operation of the FCRPS. To assist in accomplishing this, the Act requires BPA to fund fish and wildlife protection, mitigation, and enhancement actions consistent with the Northwest Power and Conservation Council's (NPCC's) Fish and Wildlife Program. Under this program, the NPCC makes recommendations to BPA concerning which fish and wildlife projects to fund.

1.3.2 Federal Columbia Power System Biological Opinion

In addition to Northwest Power Act obligations, BPA and BLM, as federal agencies, also must comply with the ESA (16 USC 1531 *et seq.*). The National Oceanic and Atmospheric Administration's National Marine Fisheries Services (NMFS) identified Lolo Creek as a watershed in need of monitoring for Snake River B-run steelhead populations in its Recommendations for Implementing Research, Monitoring and Evaluation for the 2008 NMFS Federal Columbia River Power System (FCRPS) Biological Opinion (NMFS 2008). Further, Reasonable and Prudent Alternative 50.5 of the FCRPS Biological Opinion

addressed the need for status monitoring of Snake River B-Run steelhead in the Clearwater River Basin to determine population productivity and abundance (NMFS 2008). Accordingly, Snake River steelhead in Lolo Creek are proposed for monitoring. Implementation of the Proposed Action would enable this proposal (USACE et al. 2010). In addition, other entities have echoed the need for more data relative to the abundance and productivity of the population. For example, the Hatchery Scientific Review Group recommended that "an effort should be made to improve the information base about this [Lolo Creek steelhead] population…" (HSRG 2009).

1.3.3 Spring Chinook Supplementation

Ongoing fish trapping conducted by the NPT at the existing seasonal weir site has indicated that spring Chinook salmon (*Oncorhynchus tshawytscha*) abundance in Lolo Creek is very low. To supplement spring Chinook populations in Lolo Creek, the NPT currently conducts monitoring and evaluation studies and collect adults for use as **broodstock** at the Nez Perce Tribal Hatchery (NPTH). The Proposed Action would improve NPT monitoring and collection of spring Chinook because a permanent weir would be operable during high-flow periods in the months of April and May when the existing seasonal weir cannot be installed. Collection of fish over the entire adult migration period instead of the narrow window currently available would increase the genetic variability of adults used in the supplementation program at the NPTH. Reduction in the **effective population size** of the **integrated** natural and hatchery population components can occur when the broodstock does not contain individuals across an entire spawning run (Bilby et al. 2003). Collecting broodstock across the entire run is advised to increase the genetic diversity of supplemented populations (Cuenco et al. 1993).

Weir efficiency at the Lower Lolo Weir has averaged 48 percent from 2002 to 2011. This is in sharp contrast to the efficiency of a similar weir on Newsome Creek in Idaho County, which averaged 89 percent over the same time period. The Newsome Creek facility can be installed earlier in the run than the Lower Lolo Weir, and is therefore able to capture fish from across the entire run. At the Lower Lolo Weir, because late spring/early summer flows are too high to install the temporary facility, managers cannot meet the goal of sampling spring Chinook across the run. Genetic variability for broodstock populations (e.g., salmon may be genetically predisposed to return earlier to a basin) is important to ensure that the full genetic spectrum is represented in the hatchery program

1.3.4 Special Designations

The project site is within the Upper Lolo Creek Area of Critical Environmental Concern (ACEC) and managed by the BLM in accordance with the Cottonwood Resource Management Plan (BLM 2009). The BLM preliminarily determined Lolo Creek to be suitable for designation into the National Wild and Scenic River System (NWSRS) in accordance with the FLPMA. The tentative classification for Lolo Creek is "Scenic." Scenic rivers are those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. The preliminary scenic designation includes a 27.19-mile segment of the Lolo Creek mainstem, from the confluence with the Clearwater River upstream to the U.S. Forest Service (USFS) boundary, of which 14.3 miles are on BLM-administered lands. The project site is located on this preliminary designated creek segment. The BLM determined this segment contains the following Outstandingly Remarkable Values (ORVs): scenic, recreation, fish, and historic. Management provided by the BLM is in accordance with the guidelines to approve no actions that alter the free-flowing nature of the suitable segment, measurably diminish the stream segment's ORVs, or modify the setting or level of development to a degree that will change its identified scenic classification (BLM 2009).

1.4 Existing Conditions at the Lower Lolo Weir Site

1.4.1 Existing Facilities

The existing Lower Lolo Weir site has been in operation since 2002 and includes a seasonally-installed rotary screw trap (to collect juvenile salmon), and a seasonal temporary metal picket weir that operates

from about mid-May through September to collect adult salmon. In addition to instream facilities, the site contains a workup tent, two trailers, a permanent cement block wall (protecting power supply), a permanent cement block wall by the bridge (protecting the picket weir lines), and porta-potties. All of these upland facilities are located on a flat graveled terrace within Lolo Creek's 300-foot **Riparian Conservation Area** (RCA) along the north bank (right bank looking downstream; see Appendix A for photos). The north bank terrace has been cleared to accommodate upland infrastructure, staff parking and access to the creek from Lolo Creek Road (Figure 1-2).

1.4.2 Existing Operations and Maintenance at the Lower Lolo Weir Site

1.4.2.1 Existing Operation & Maintenance Practices

The NPT typically install the temporary picket weir over four days in mid-May, and operate the weir through late September. The seasonal weir is manually installed in the spring when flows drop below 500 cubic feet per second (cfs). Although the existing weir functions adequately when flows are less than 500 cfs, due to safety concerns and weir performance, it cannot be installed or operated during high flow events. These high flows typically occur in April and May. Because the peak of the steelhead run occurs in March and April, the seasonal weir cannot be used to monitor steelhead. Further, the weir cannot be installed at the onset of the spring Chinook run, which begins in early May. The inability to operate the weir over the full spring Chinook run precludes the collection of the full genetic spectrum of fish for use as NPTH broodstock.

The juvenile screw trap is installed in one day, usually in March, and is operated through mid June. The NPT removes the trap during the summer following the juvenile salmon outmigration period, typically in early August. The NPT reinstall the trap in late August to collect fall outmigrating juveniles; the trap is operated through the fall, and then removed in late November.

1.4.2.2 Existing Operation & Maintenance Costs

Current operation and maintenance (O&M) costs for the existing trapping facilities are estimated to be approximately $73,000 per year. These costs do not include any major work that might be necessary to repair the facility if damaged during extreme high flow events.

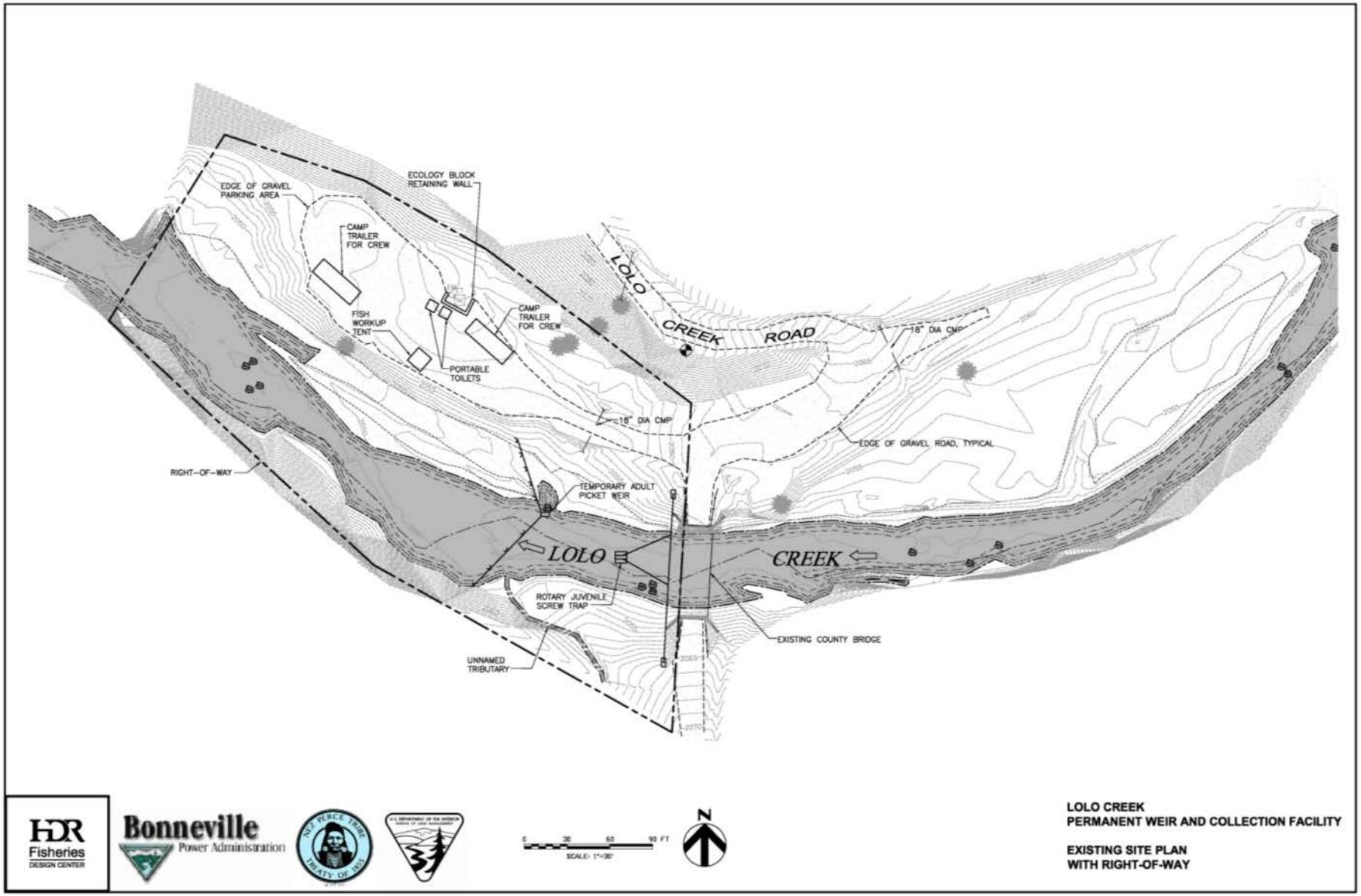

Figure 1-2. Existing Facilities at Lower Lolo Creek Weir Location, with Right of Way Polygon Shown.

1.5 Scoping, Public Involvement, and Issues

On September 29, 2011 BPA sent a letter to people potentially interested in or affected by the proposed project, including public interest groups, recreational groups, local governments, and state and federal agencies. The letter explained the proposal, the environmental process, and requested comments within 30 days. The public letter was posted on the project website at (http://efw.bpa.gov/environmental_services/Document_Library/LoloCreek_PermWeir_FishTrapping_Facility/). BPA then extended the comment period for an additional 30 days and included additional groups to the mailing list. Five written comments were received and can be found in their entirety on the project website. All comments have been addressed in the relevant sections of this EA.

Comments included the following:

- The Friends of the Clearwater wrote in opposition of the project, suggesting that an EIS should be written based on the potential for significant effects to the Outstandingly Remarkable Values of Lolo Creek, which BLM has determined to be preliminarily suitable for designation under the National Wild and Scenic River System. The group also expressed concern relative to the consistency of the Proposed Action with the Cottonwood RMP, PACFISH (see Section 4.1.4.3), and the ESA, and requested an analysis of a range of alternatives to meet the purpose and need.
- A commenter expressed concerns relative to water quality issues during construction and operation of the weir and requested that the NEPA and ESA consultations discuss these issues with respect to ESA-listed bull trout.
- A commenter requested plans to review, along with an analysis of construction effects. The commenter opposed the development of a permanent weir, prefers that the creek not be altered, and requested a cost analysis of the current and proposed operations and a survival/mortality estimate [species not indicated].
- A commenter expressed concerns over site selection given the occurrence of historical resources including the Lewis and Clark Trail and the Nez Perce Trail.
- A commenter expressed concerns that the site is within a few yards of the Lewis and Clark Trail, and the proposed facility would diminish the value of his property near the site.

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Chapter 2
Alternatives

This chapter describes the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from detailed study.

2.1 Proposed Action – Permanent Fish Weir with Recreation Elements

Under the Proposed Action, BPA would provide funding to the NPT to construct a permanent fish collection and monitoring facility and the BLM would amend the existing ROW to accommodate the new facilities. The permanent facility would replace an existing seasonal, temporary fish collection facility that the NPT has operated since 2002 (refer to Section 1.3.4). In addition, under the Proposed Action the BPA, NPT and BLM would fund the installation of public recreational elements.

The proposed facility would consist of an instream weir, fish trap and ladder, and associated upland elements - all located within the boundaries of the NPT's existing 2.4-acre ROW on BLM land (Figure 2-1). Fish moving upstream would encounter the weir and enter a fish ladder or "**fishway**" located along the north bank. Fish would ascend pools in the fishway by swimming through a slot. Once they ascend the fishway, fish would enter a trapping facility for collection or data gathering. Following data gathering, NPT staff would return fish to the creek, with the exception of those spring Chinook collected for broodstock for the NPTH.

Refer to Figure 2-2 for representative photographs of a BPA-funded weir facility in northeast Oregon; the instream components of the proposed Lolo Creek weir would be similar.

Figure 2-1. Rendering of Permanent Fish Weir with Recreation Elements.

Figure 2-2. Photographs of the Similar Weir and Fishway/Trap in Lostine, Oregon (Recently constructed facility, immediately post-construction, plantings not yet established along banks).

Photos show both operational and non-operational periods with weir raised and lowered. Top photo shows weir raised, bottom photo shows weir lowered. The fish weir on Lolo Creek would look similar to this structure.

The proposed fish weir would be designed to operate safely over a greater range of flows than the existing weir to monitor ESA-listed Snake River steelhead and to collect spring Chinook salmon as part of on-going supplementation efforts in Lolo Creek. The proposed weir would be operable during the winter and spring steelhead migration period when stream flows are too great for the existing weir to function, enabling data gathering per NMFS recommendations for monitoring of steelhead populations in the Clearwater River Basin (NMFS 2008).

The Proposed Action would include the following elements, which are compatible with the NPT's existing ROW grant for use of the site (see Figure 2-3 and Figure 2-4):

- Weir, concrete sill, fishway, trap, abutments, flexible return pipe, and streambank protection
- Workup shelter
- Buried hydraulic lines
- Building for mechanical equipment
- Juvenile **screw trap anchors** buried in both banks
- Trailer pad
- Boater put-in, take out and recreational parking area
- Vaulted toilet
- Interpretive informational panels
- Riparian habitat enhancement, including planting of north bank with native trees and shrubs

Power exists at the site; no electrical upgrades would be required under the Proposed Action.

The NPT operates a seasonal juvenile trap that floats in the water and captures juvenile salmon to monitor populations. This trap is typically installed downstream of the Lolo Creek Road/Woodland Bridge and upstream of the seasonal weir facility. With the exception of buried anchors to support an existing juvenile fish trap, the Proposed Action would not include any modification to existing juvenile screw trap infrastructure or operations at the site.

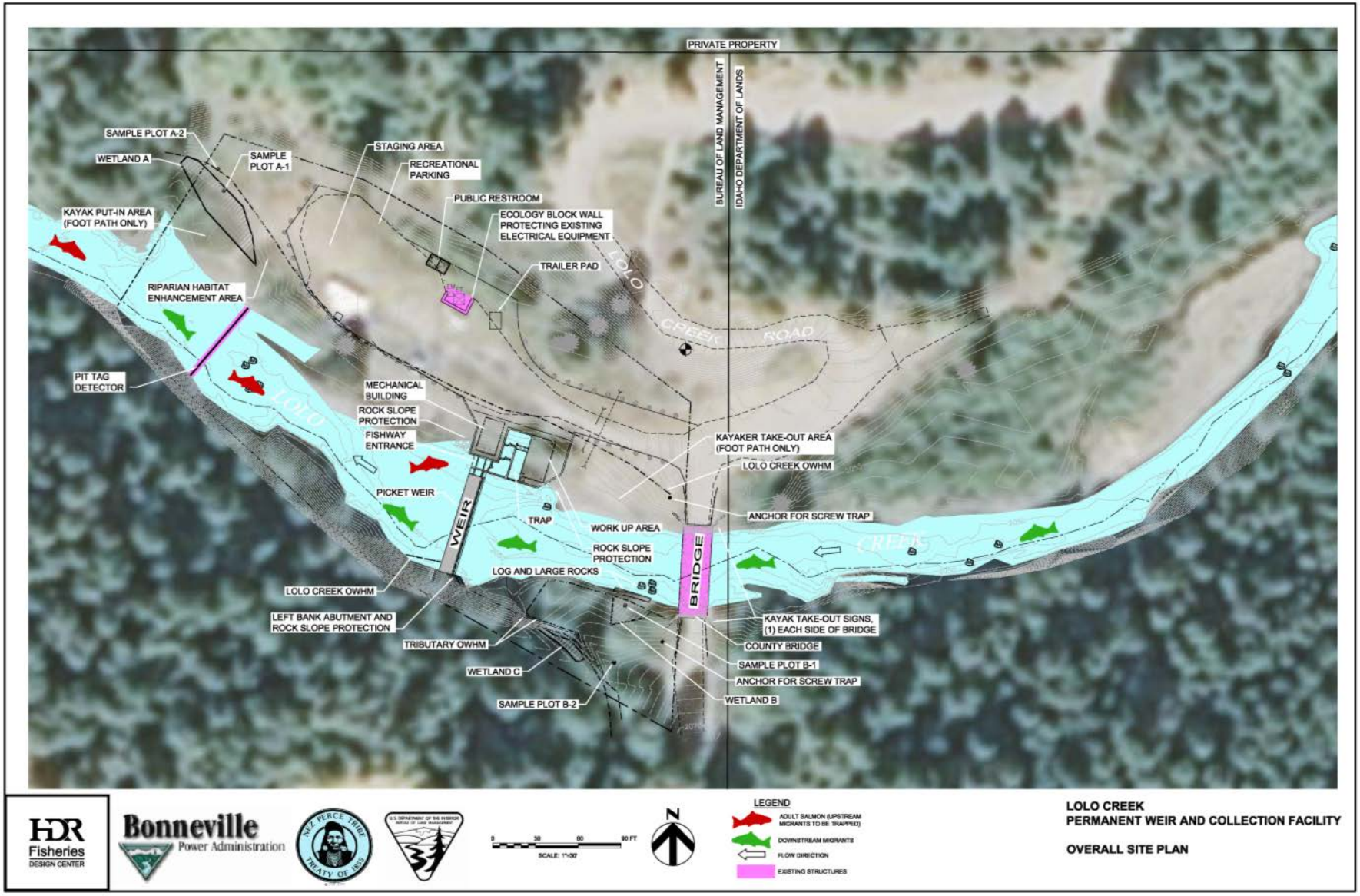

Figure 2-3. Proposed Site Plan.

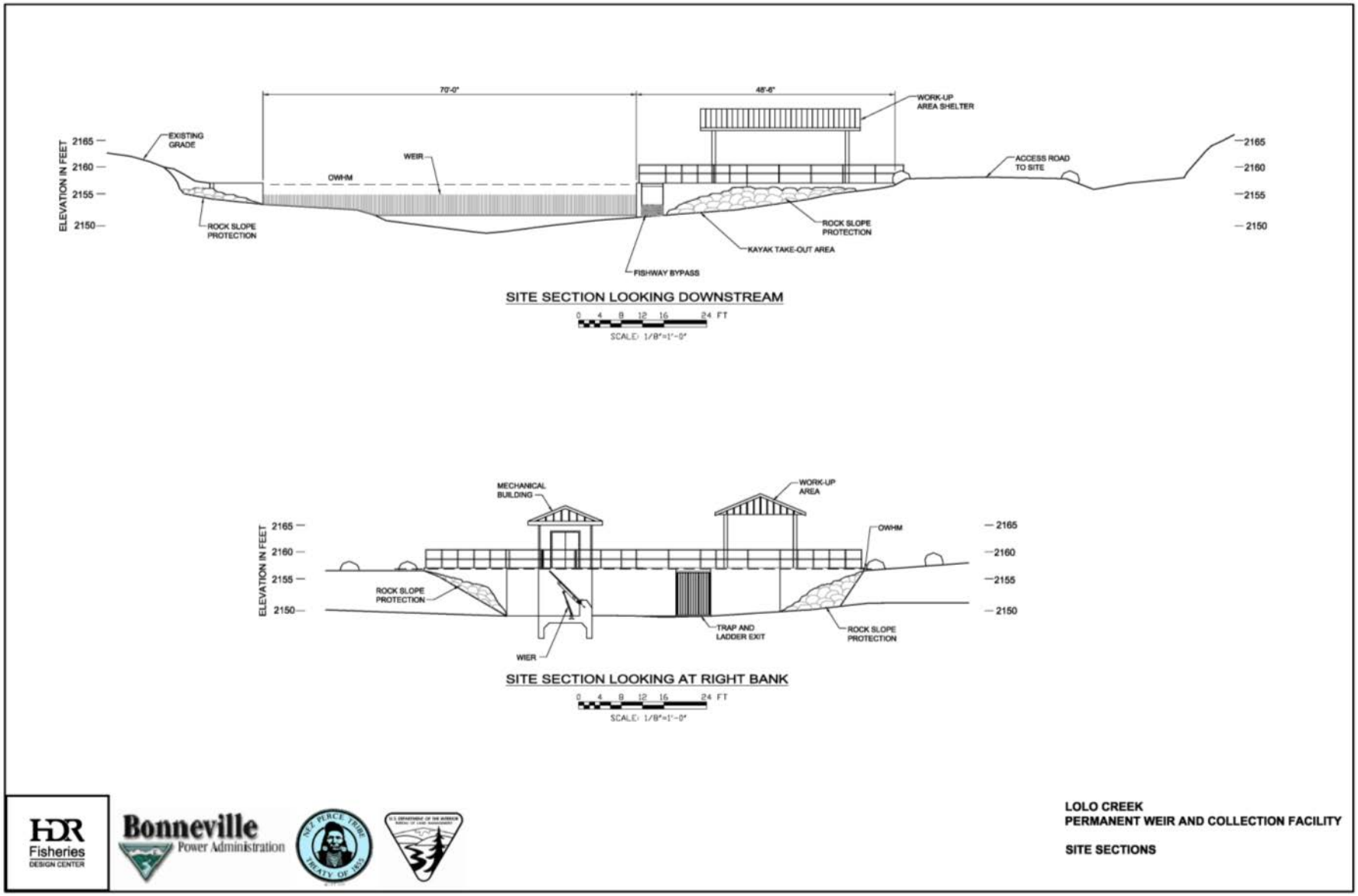

Figure 2-4. Cross Sections of Proposed Weir Facility.

2.1.1 Permanent Fish Weir Construction and Operations

Construction of upland project elements, including recreational elements, is anticipated to occur over a period of 8 months, beginning in April 2013, or when safe access to the site is available following snowmelt. Construction of instream elements would occur during an agency-recommended instream work window of August 1 – October 31 (Ries 2010; Fletcher 2010; Hennekey 2010). Operation of the facility would occur annually from as early as January through the end of September.

2.1.1.1 Upland Project Construction

Approximately 3,000 square feet of currently disturbed/graded uplands along the right bank (looking downstream; or north bank) of Lolo Creek would be graded to a finished elevation of 2,057 feet, which is approximately the existing elevation. Existing facilities that would be maintained in their current condition include electrical equipment and a phone line. There is currently no potable water source (well) or septic system on site and no new facilities would be added under the Proposed Action.

Access and Infrastructure

Public access to the lower portion of Lolo Creek is extremely limited. Of all the sites considered (see Section 2.3.1) only two sites have county-maintained roads, and the existing site is the only one located on public lands. The location of the proposed permanent weir at the existing site has been in use by the NPT for juvenile screw trap and temporary weir operations for over 10 years, and a fish detection system was installed at the site in the fall of 2011. This existing weir site contains ample parking (can accommodate 5-7 work trucks), adequate fish truck turnaround space, public-accessible porta-potties, cement block wall (or ecology block wall, protecting power supply), trailer parking sites and upgrades for telephone services. These features would be maintained under the Proposed Action, though the porta-potties would be upgraded to an ADA-accessible vaulted toilet. Public recreation access and infrastructure are analyzed in section 2.1.2.

Screw Trap Anchors

The seasonally-installed juvenile screw trap is currently held in place using cables attached to cement blocks positioned on the north and south banks of Lolo Creek. Under the Proposed Action, buried north and south bank anchors would replace this anchoring system. The anchors would be installed in the footprint of the existing cement block anchors located immediately downstream of bridge abutments. No other modification to screw trap infrastructure or operations is proposed.

Trailer Pad

A new concrete trailer pad (8 feet by 10 feet) would be added to the site just east of the existing porta-potties.

Mechanical Building and Workup Shelter

A small building (10 feet by 20 feet) would be constructed landward of the fish trapping facility to house the weir's hydraulic system. The hydraulic lines (providing air to lift the weir panels and oil lubrication) would be buried from the building to the cylinders that lift the barrier up and down. Synthetic hydraulic oil would be used in this system, as recommended by NMFS; however, no oil would be stored on-site. A pre-fabricated metal workup shelter (15 feet by 30 feet) would be installed just landward of the fishway to provide a covered area for fish data collection at the trap.

Staging Area

Construction equipment would be staged on the north bank landward of silt fencing placed along the outer edge of graveled areas that have been previously cleared and filled (Figure 2-3).

Riparian Plant Enhancement Area and Site Restoration

To mitigate for disturbance along the streambank due to installation of the collection weir, particularly for removal of up to three mature conifers on the south bank (left bank looking downstream) of Lolo Creek, portions of the north bank riparian corridor would be planted with native shrubs (see Section 2.1.3, Environmental Design Features/Mitigation Measures). Along the north bank, downstream of the proposed boater-launch area (at the western-most portion of the site), portions of the bank would be planted with native species including cedar (*Thuja plicata)* saplings and several willow bundles (*Salix sitchensis*).

Following construction, disturbed upland areas would be seeded with appropriate native species. Streambanks would be planted with willows in areas where riparian shrubs are removed to accommodate construction equipment.

2.1.1.2 Instream and Streambank Construction

Instream work would occur behind **cofferdams** to avoid potential turbidity impacts on water quality during installation. The following structures would be constructed during the instream work period specifically established for this project (August 1 – October 31):

- Weir, including concrete sill, low flow notch, bank abutments and streambank protection
- Vertical slot fishway
- Fish trapping/holding area

Construction of these elements would disturb a total of 2,651 square feet of instream or streambank habitat. In addition, several large instream boulders would be removed from the weir footprint. The boulders would either be manually removed using excavators behind the cofferdams, or removed via fracturing, which entails drilling of holes into boulders and insertion of small detonation devices to break up boulders to manageable sizes for removal. Excess excavated streambed and bank materials (primarily consisting of cobbles and boulders) would be temporarily stockpiled in the staging area for use at the site as fill under the fish collection facility, or transported off site to an upland location to be determined by the contractor, as approved by the BLM.

Instream activities would occur from August 1 through October 31 of the calendar year. Instream construction would be conducted according to the provisions of the Clean Water Act (CWA) Section 404 permit (U.S. Army Corps of Engineers [USACE]) to be obtained for this project, as well as the State of Idaho Stream Channel Alteration permit recently issued by the Idaho Department of Water Resources (IDWR). The existing facility landing along the north bank and Lolo Creek Road would provide construction access to the creek. The south bank is accessible to construction equipment (if necessary) via the Lolo Creek Road/Woodland Bridge.

Erosion and sediment control measures would be implemented prior to initiation of construction activities (see Section 2.1.3). A silt fence would be placed along the top of the bank at the edges of the excavation area and would tie into the cofferdam to minimize sediment transport to the creek. A silt fence would also be placed along the top bank of a small intermittent channel that enters the creek upstream of the construction area on the south bank.

Instream Work Area Isolation

Prior to conducting instream work, the work area would be isolated from the active flow of the creek. This would allow for all instream work (described in subsequent sections) to occur “in the dry” (meaning, isolated from the active flow of the creek). Prior to work area isolation, the existing seasonal picket weir would be installed downstream of the instream construction area so that spring Chinook broodstock collection can continue during the construction period. The seasonal weir would remain in place through the typical spring Chinook collection period (May through the end of September). During this time, all **non-target fish** (i.e., spring Chinook not required for broodstock), would be manually transferred upstream of the work area and returned to the creek. ESA-listed fish would be transferred upstream in

compliance with NPT's existing Section 10 permits for steelhead and bull trout. This transfer would be conducted by NPT weir operators using water-to-water transfer methods. Non-target fish would be placed into totes and trucked upstream of the Lolo Creek Road/Woodland Bridge, where they would be returned to the creek to continue their upstream migration. During dewatering of the instream work area, NPT biologists would ensure that all fish are safely removed from behind the cofferdams and relocated safe distances upstream. Fish salvage protocols during dewatering are described in more detail in Section 2.1.3, Environmental Design Features/Mitigation Measures.

Although the precise method of instream work isolation would be dependent on flows encountered during the construction period, instream isolation might be accomplished using a series of culverts installed along the right (north) bank of the creek (Figure 2-5). Cofferdam materials would be placed in the channel using an excavator operating in the flowing channel, or using an excavator on the north bank that would transfer bags to an excavator positioned in the channel. Equipment operating instream would work atop bedrock or boulder **substrate** to the extent possible to minimize streambed compaction. No stationary equipment would operate in the flowing channel after the cofferdams are in-place, though occasional equipment crossing may be required in the active channel.

Once the upstream portion of the cofferdam spans the channel from the north bank culvert to the south bank, the creek would be routed into the culverts, which would be sized to accommodate peak flows typically experienced during the instream work period plus a 25 percent exceedance (100 cfs based on U.S. Geological Survey [USGS] Station 13339500 data from August through October). Once the creek is successfully bypassed through the culverts, excess excavated earthen materials obtained during upland construction activities (including vaulted toilet excavation area, and upland grading locations) would be piled atop the culvert to create a land-bridge. All materials would be contained within the cofferdam.

Following completion of the weir components, cofferdam materials would be repositioned into a semi-circle along the north bank to allow for construction of the fishway and trapping facility. All cofferdam materials would be removed from the creek after instream work is completed. Equipment operated instream would be equipped with vegetable-based hydraulic oil. Equipment that is used for instream work would be cleaned prior to operations below the **ordinary high water mark** (OHWM) and all external oil and grease would be removed, along with dirt and mud. No untreated wash and rinse water would be discharged into waterbodies or wetlands. Sumps would be installed behind the cofferdam to capture all seepage water from the instream work area; seepage water would be settled prior to discharge to the creek. Discharge would be accomplished using straw bales or other similar velocity-reducing biofiltration devices (e.g., filtration through straw bales). Options for settling include pumping to: a temporary upland settling basin for infiltration, a Baker tank or similar type structure, a bermed pond, or pumping to a series of permeable geotextile bags. All settling and discharge would be conducted according to permit requirements. The proposed location of the settling basin is shown in Figure 2-5; however, an alternate location within the ROW may be preferable during construction. This location would be approved by the BLM.

Picket Weir with Concrete Sill and Abutments

A picket weir would be constructed in the general footprint of the existing seasonal weir. Construction equipment would access the instream work area, including the south bank abutment location, via the north bank "land bridge". This temporary "bridge" would span the creek bypass, allowing access from the north bank into the instream work area, which would be isolated from the active flow of the creek using cofferdams, as described above. No access from the south bank is anticipated to be required.

Installation of the new weir would require construction of a cast-in-place concrete sill onto which the hydraulic lifts and gate hinges would affix. The sill would be embedded into the substrate, extending approximately eight to ten inches above the streambed. The concrete sill would be approximately 10 feet wide and would span the entire width of the creek (approximately 70 feet at this location). Up to three mature conifers would be removed to accommodate the south bank abutment. These trees would most likely be felled in the early summer (June or July) using equipment stationed in the instream work area,

within the confines of the isolation cofferdam. The trees would be hauled to the north bank staging area for temporary storage until they are moved off-site for potential use as materials for restoration efforts in the drainage.

The weir would consist of hydraulic lifts and hinged pickets mounted to a concrete sill. It would function by raising picket panels upwards to a 45-degree angle. At full extension, the pickets would lift, blocking passage of most fish; however, one-inch spacing between the pickets would allow for the safe passage of juvenile fish. Once reaching the weir, flow from the fishway would attract fish into the structure. Upon entering the trap, fish would be sorted for transport or data collection, and non-target species would be returned to the creek.

The picket weir would operate up to maximum creek flows of 2,000 cfs from as early as January through September. At flows greater than 2,000 cfs, the pickets would be lowered to protect the facility from damage. When not in use, the pickets would slope downstream to facilitate passage of sediment and debris. A four-foot wide opening would be notched into the concrete sill on the north bank to allow for low flow passage during non-operational periods. The bottom of this low-flow notch would be level with the upstream substrate elevation. Hydraulic modeling shows that flows below 10 cfs would be directed down the fishway or low flow notch (HDR 2011a). When flows exceed 10 cfs, water would begin to flow over the sill while still supplying the majority of flow to the fishway to maintain upstream passage.

Fishway and Trapping

During operation, upstream passage around the weir would be accommodated through a vertical slot fishway on the north bank. According to NMFS, steelhead and salmon prefer this type of fishway over "pool and weir" types (NMFS 2003a). In addition, due to the known occurrence of Pacific lamprey in Lolo Creek, the fishway would be designed to pass adult lamprey. To accommodate lamprey passage, the fishway would contain rounded walls and sill blocks.

Approximately 338 cubic yards of streambed and bank would be excavated to install the north bank abutment and fishway/trapping structure. Excavation of the streambed would be minimized to maintain the natural grade of the creek through the fishway. Following construction, the stream bank would be re-vegetated with native species, including willows.

Considering the highest flows experienced at the site, the fishway would accommodate both juvenile and adult **salmonid** passage during weir operations to meet NMFS passage guidelines (NMFS 2011). The fishway has been designed to provide appropriate attraction flow over the full range of flows experienced at the weir. During high flow periods, the maximum height between each vertical slot would be 12 inches, in accordance with NMFS fish passage criteria (NMFS 2011).

A small trapping structure would be constructed adjacent to the weir along the north bank. This structure could accommodate a lifting system that would mechanically raise fish to a working area if future funding became available. This lifting system would require installation of additional infrastructure in the trap area, but not within the creek itself. As such, no dewatering of the creek or associated fish salvage would be required. If the lifting system is added to the site in the future, construction and operation would occur in compliance with all applicable state, federal and local regulations. If a future lifting system is installed, no additional effects to resources are expected to occur beyond those described in this EA.

To protect against potential structural damage during high flow events, a concrete retaining wall would extend approximately seven feet upstream of the structure along the bank. A work shelter would extend landward of the north bank trap and into the area behind the retaining wall. This shelter would be used to record, measure, and sort all fish species that ascend the fishway.

Streambank Protection

Streambanks adjacent to the proposed weir and fishway/trap may be subject to scour during high flows. Large rocks would be added to the upstream and downstream face of the fishway/trap on the north bank to reduce the potential for bank erosion and the introduction of fine sediments. The south bank is comprised of

bedrock; however, a small amount of rocks may be required to protect the south side abutment. Placement of rocks used for bank protection would be designed per USACE Section 404 Clean Water Act permit specifications, and the rocks would come from an existing local source approved by BLM. Rocks would not protrude into the channel to a degree that would affect the free-flowing nature of the creek.

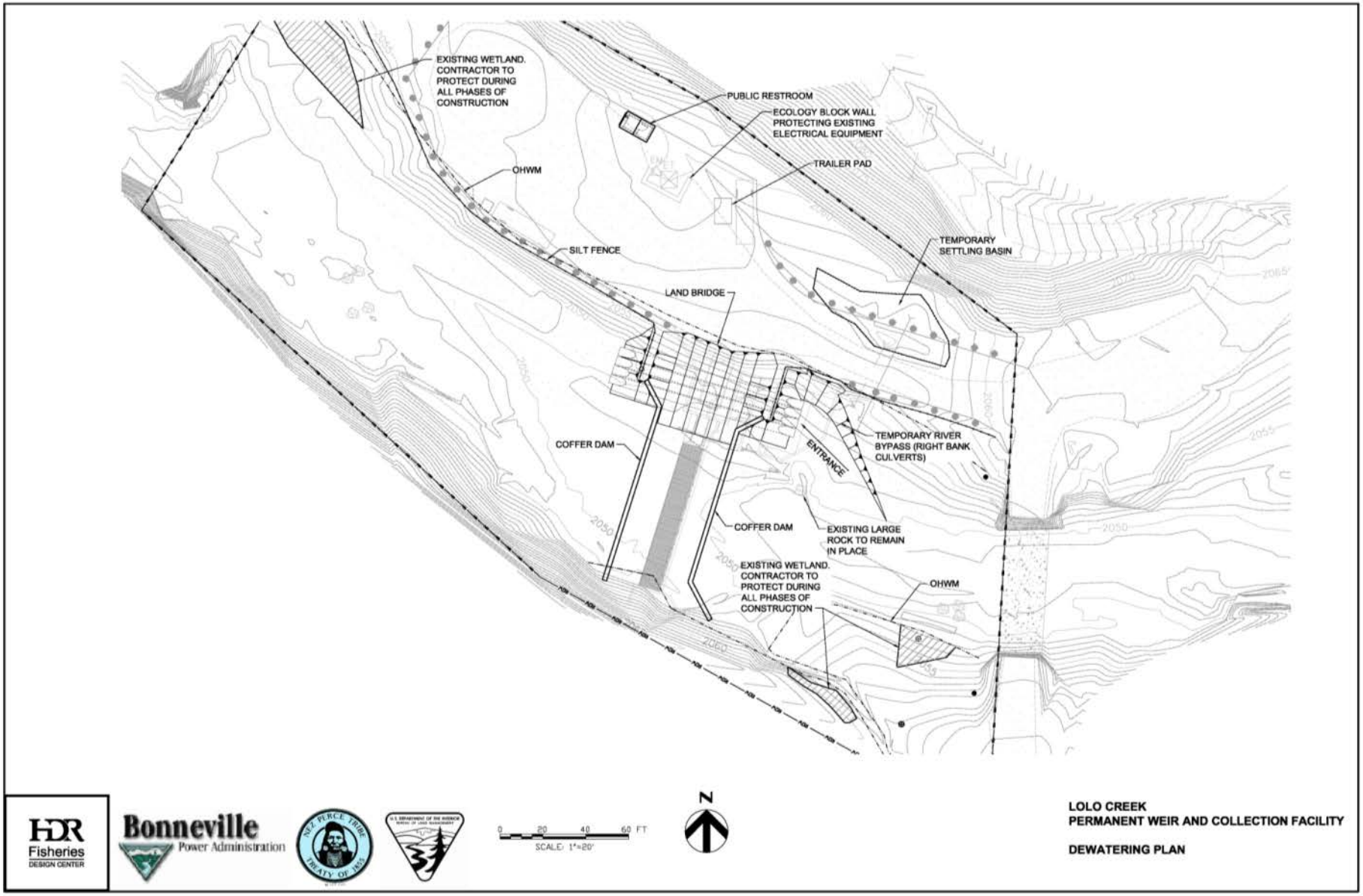

Figure 2-5. Instream Isolation Plan, Showing North Bank Culvert Bypass.

2.1.1.3 New Facility Operations

Trapping Periods

The proposed permanent weir would operate from as early as January through September to monitor Snake River steelhead (passed upstream to spawn), and to collect or pass spring Chinook. Seasonal ice may delay weir start up until February or March. During operational periods, the raised barrier would block all upstream migrating adults; however, juvenile **smolts** would pass downstream through the pickets. When picket-passage is not feasible (extreme high or low flows), passage would be accommodated through the new fishway on the north bank. The upstream entrance of the fishway/trap would contain a picket gate sized with one-inch spacing that would prevent adults from exiting, but would allow juveniles to pass upstream and downstream.

At a minimum, the trapping structure would be visually inspected daily, and up to three times during spring Chinook broodstock collection periods. Trapped, non-target fish would be held for no longer than 24 hours before being returned to Lolo Creek upstream of the trapping structure via a fish return pipe. Inspection and handling for steelhead and bull trout would occur in accordance with existing ESA Section 10 authorizations held by the NPT, as well as the Section 7 ESA consultation for the project and the draft Hatchery and Genetic Management Plan for non-ESA listed NPTH spring Chinook salmon in the Clearwater Subbasin (NPT 2012a).

Because the creek stage varies dramatically during the proposed operational period, the return pipe would consist of flexible tubing that would be attached to a fixed pipe from the work area. The tubing could be positioned anywhere along the bank, allowing managers to assess instream flows and return fish to the creek in locations most conducive to continuation of upstream migration.

During trapping, spring Chinook broodstock would be transferred to a separate holding area and then moved onto haul trucks, which would access the work area via the existing facility access road (refer to photos in Appendix A). Spring Chinook in excess of weekly broodstock goals would be passed upstream to spawn naturally. The annual broodstock collection goal for Lolo Creek spring Chinook salmon is 110 adults (assuming a 50/50 male to female split). Steelhead collected at the weir would be measured, identified to sex, and checked for tags. Life history information, including scale samples, would be collected from each fish in the holding area. Steelhead would likely be marked (PIT tag) to allow for future mark-recapture estimates.

If steelhead **kelts** or bull trout are observed on the upstream side of the weir, they would be passed by lowering the weir. Weir lowering would take approximately 30-40 seconds. An NPT biologist would be on site 24 hours a day, 7 days a week to monitor for fish upstream of the weir.

Non-Trapping Periods

During non-trapping periods (October through January, or later depending on creek icing), the pickets would be positioned to have a slight down-slope, allowing fish to pass directly upstream or downstream over the weir. Although it is anticipated that substrate would backfill behind the sill over time, the sill has the potential to create a passage barrier during extreme low flows (i.e., when flows are not sufficient to overtop the sill). This may occur at flows of 10 cfs or less. A four-foot wide opening would be notched into the concrete sill on the north bank edge where water is directed to support trapping operations. The bottom of this notch would be level with the upstream streambed and would provide passage during low flows as water would move freely through the opening. During operational periods, this notch would be closed with a gate and/or flashboards to prevent use of the opening by targeted spring Chinook and Snake River steelhead.

Facility Maintenance

Throughout the operational period, minor maintenance actions may be performed to ensure that the weir and fishway are functioning properly. Examples of facility maintenance include:

- Fill of minor scour holes in the weir sill
- Replacement of weir panels that are damaged by large objects moving downstream
- Minor excavation at the ladder entrance and exit, and within the ladder/trap itself, to ensure passage is not encumbered by accumulated sediment
- Minor excavation of the non-target fish return pool to ensure appropriate depth and slope
- Repair/replacement of streambank protection to maintain the integrity of facility infrastructure

Necessary maintenance activities would likely be accomplished in the wet (in the active channel without dewatering) considering the minor nature of actions, the remote nature of the site, and the likelihood that activities can be completed in a short amount of time (1-5 days). Instream maintenance activities would occur during the low-flow summer season (approximately late July through September). If work is required outside of the low flow summer season to ensure continued operations, the BLM, BPA, and NPT would coordinate with the appropriate regulatory agencies to obtain authorizations.

Emergency Repairs

Although equipment failures related to the weir cannot be predicted at this time, picket weir panels or associated hydraulic equipment may become damaged during high flow events. If pickets are damaged by large objects and require replacement, the repair would likely require dewatering of the work area to allow damaged structures to be taken off-line and replaced with new panels that are connected to existing hydraulic lines. Small concrete pours may be required if the sill becomes damaged during high flow events; such pours would also require instream isolation.

If required, emergency repairs would occur as quickly as possible during the August instream work window. If repairs cannot be accomplished during the month of August, the BLM, NPT and/or BPA would consult with the regulatory agencies to ensure compliance with applicable regulations. If required, instream work isolation and dewatering methods would be similar, though less extensive, to those described for initial construction. If emergency repairs require instream work isolation and dewatering, effects to resources would be similar in nature to those described in this EA, though effects would occur over a shorter period of time.

Facility Costs

Estimated operations and maintenance (O&M) costs for the Proposed Action would be slightly higher than existing O&M costs. NPT staff are currently present at the site during the spring smolt outmigration season to operate the juvenile screw trap. As such, increased labor costs are not anticipated due to the extended weir operational period since staff would already be onsite. Operational cost estimates for the facilities included in the Proposed Action are estimated from current O&M costs for existing trapping operations at the Lower Lolo Weir, which are approximately $73,000 per year (not including major damage/repair work). The additional costs applied to the new facility include:

- Facility power – annual cost estimate is $2,760 per year, including heat for the new workup shelter
- Typical facility operations supplies & maintenance – estimated average per year at a similar facility (Lostine Weir) is $8,030, which includes typical trapping operations and upkeep

2.1.1.4 Construction and Operational Period

Construction of the Proposed Action would occur over a period of eight months, beginning in April or May of 2013. Based on discussions with several regulatory agencies, including NMFS (Ries 2010), USFWS (Fletcher 2010), and the Idaho Department of Fish and Game (IDFG) (Hennekey 2010), instream work for the Proposed Action would occur from August 1 – October 31, 2013. Operation and maintenance of the facility would occur from as early as January through September each year.

2.1.2 Public Recreational Facilities

As part of the NPT ROW amendment agreement with BLM, BPA has agreed to contribute funding for public recreational facilities at the project site. These facilities would be funded by the BLM, as well as BPA and the NPT.

2.1.2.1 Vault Toilet

An ADA-accessible vaulted toilet would be installed in the upland area along the cleared flat of the north bank of Lolo Creek. Installation would require excavation of a pit followed by placement of the vault into the ground. The vault toilet will replace two porta-potties currently supplied by NPT during facility operations. NPT permits the public to use the NPT supplied porta-potties. Restroom facilities have been and will continue to be accessible to the public. The increased capacity of the vault toilet will decrease maintenance costs associated with the removal of human waste from the site.

2.1.2.2 Boater Put-in and Take-out

A boater put-in would be designated downstream of the weir along the north bank (Figure 2-3). A boater take-out would be designated on the graveled north bank just upstream of the weir facility, downstream of the Lolo Creek Road/Woodland Bridge. The boater put-in and take-out locations would help facilitate portage around the weir, especially since the permanent weir would block boat passage throughout the year, including during high-flow seasons when the existing temporary weir has typically been removed.

2.1.2.3 Recreational Parking

Signage would be used to designate up to two parking spaces at the western-most end of the parking lot for recreational users. These parking spaces would be used by the public (e.g., swimmers, kayakers) to provide access to the site, and to the designated kayak put-in area, located along the north bank downstream of the proposed weir (Figure 2-3).

2.1.2.4 Informational Panel and Signage

A small, removable informational panel would be added on the north bank in the upland area near the entrance to the site off Lolo Creek Road. In addition, a sign would be affixed to the upstream side of the Lolo Creek Road/Woodland Bridge to warn kayakers of the downstream weir and to direct them to the designated boater take-out, downstream of the bridge on the north bank.

2.1.3 Environmental Design Features/Mitigation Measures Included as Part of the Proposed Action

BPA incorporated environmental design features/mitigation measures into the design of the Proposed Action to minimize the impacts of the Proposed Action. The benefits of these features would occur during project construction and/or operation. Table 2-1 lists the design features/ mitigation measures included as part of the Proposed Action.

Table 2-1. Environmental Design Features / Mitigation Measures Included as Part of the Proposed Action.

Resource	Environmental Design Feature/ Mitigation Measure
Aquatic Habitat and Special Status Species	***General Environmental Design Features*** • Use sediment barriers such as fences, weed-free straw matting/bales or fiber wattles as necessary in all work areas sloping toward Lolo Creek to intercept any surface flow that might transport sediment to the stream channel. • Stage construction equipment and materials landward of the top of the bank behind silt fencing that would designate grading and clearing areas. • Operate machinery, to the extent feasible, from the top of the stream bank along adjacent uplands and previously cleared areas. • Store construction fuel and refuel equipment in the staging area, no closer than 35 feet from the creek. This distance is the largest possible considering site constraints. • Operate fuel storage and refueling areas using best management practices (**BMPs**) and equip these areas with appropriate spill containment systems. • Use water trucks to apply water daily to the construction area for dust abatement. • Wash heavy equipment that may work below the OHWM before it is delivered to the job site. • Inspect equipment to remove vegetation and dirt clods that may contain noxious weed seeds. • Inspect machinery daily for fuel or lubricant leaks. • Cover and stockpile excess excavated materials away from the creek and flank with sediment fencing to minimize opportunity for fine sediment to be transported into Lolo Creek. • Transport surplus excavated materials off site to an approved receiving location to be determined by the contractor and approved by the BLM. ***Instream Construction Environmental Design Features*** • Conduct instream work from August 1 through October 31 as recommended by NMFS (Ries 2010), and approved by the USFWS (Fletcher 2010) and IDFG (Hennekey 2010). • Operate machinery for instream construction from the top of the stream bank along adjacent upland areas. • Conduct excavation for installation of the weir abutments and trapping/holding facility from the bank, or below the OHWM in the dry (since construction would occur during base flows) to the extent possible. • Locate equipment, if possible, atop bedrock to limit substrate compaction during the placement of cofferdam materials. • Avoid operating equipment in active flow following placement of the cofferdam. • Place cofferdam materials (cement blocks, aqua bags or supersacks with Visqueen) using an excavator working atop bedrock that retrieves materials from a stockpile on the top of bank. • Remove all construction cofferdams from the creek by October 31. • Complete all major work, including concrete pours, by October 15. • Tether super-sack bags, if used, to prevent cofferdam failure in the event that high flows occur prior to the end of the instream work window. • Retrofit hydraulically-operated equipment that may work below the OHWM with vegetable-based fluid in the hydraulic system. • Protect existing riparian vegetation to the extent possible.

Table 2-1. Environmental Design Features / Mitigation Measures Included as Part of the Proposed Action.

Resource	Environmental Design Feature/ Mitigation Measure

Aquatic Habitat and Special Status Species, continued	***Instream Construction Environmental Design Features, continued***
	• Comply with requirements for discharges to waters of the U.S. under the Clean Water Act, as administered by the USACE.
	• Use weed-free straw matting, silt fences, or other materials to reduce the opportunity for soil erosion into the stream channel.
	• Replant all disturbed areas upon project completion using native plant species.
	• Use diesel or electric sump pumps if needed to capture seepage flow from cofferdam areas.
	• Capture leakage under the cofferdam, if possible, from the internal upstream face of the cofferdam (using a small caged pump or a trailer-mounted pump) and pump water to the temporary settling basin, bermed pond, a Baker tank or similar structure, or geotextile bags. Biofiltration materials would be used to return pumped water to the creek (e.g., filtration through straw bales).
	• Route silt-laden seepage water that is not feasibly captured, if possible, to a settling system prior to discharge back to the creek per permit requirements.
	• Implement fish salvage and release operations during dewatering for construction of instream project elements according to conditions of Biological Opinions issued for the project by NMFS and USFWS, as follows:
	  • Ensure safe handling of all fish by using a fishery biologist experienced with work area isolation to conduct or supervise any required capture and release operation.
	  • Guide adult fish from the area behind the cofferdams to areas upstream or downstream of the construction area.
	  • Use beach seines (herding) and sanctuary nets (solid-bottomed) as part of any dewatering process, using NPT personnel, to herd fish or capture and release (water to water transfer) all fish observed in the area.
	  • Follow NMFS electrofishing guidelines if electrofishing equipment is used to capture fish (NMFS 2000).
	  • Conduct electrofishing operations, if necessary, using NPT personnel.
	  • Use an electroshocker specifically designed for lamprey larvae to ensure safe and effective removal of lamprey.
	  • Record species and lengths, using a fishery biologist, of any ESA-listed fish mortalities encountered, and provide data to USFWS and NMFS.
	• Ensure that a project biologist is present during placement and removal of the cofferdams to verify that design features are implemented and that any site specific adjustments afford appropriate protection to ESA-listed species and their habitat.
	• Install and remove cofferdams over several hours to allow streamflow to be reduced and rewatered gradually.
	• Return displaced substrates to pre-disturbance condition (slope, composition, etc.).
	Operational Environmental Design Features
	• Position the flexible fish return tube in a location that allows for safe re-entry into the creek for continuation of upstream migration.
	• Lower the weir to allow downstream passage of woody debris on a daily basis during heavy debris loading periods.
	• Lower the weir when steelhead kelts or bull trout are observed upstream of the structure to allow downstream passage.

Table 2-1. Environmental Design Features / Mitigation Measures Included as Part of the Proposed Action.

Resource	Environmental Design Feature/ Mitigation Measure
Aquatic Habitat and Special Status Species, continued	***Operational Environmental Design Features, continued*** • Open the low flow passage notch during low flow non-operational periods to allow unimpeded passage by adults and juveniles around the structure. • Conduct all routine maintenance actions for the weir facility during low flow periods in the summer (primarily August), when high instream temperatures likely minimize use by fish species. • Consult the appropriate agencies if maintenance is necessary outside of the low flow periods to ensure compliance with state, federal and local regulations for instream work. ***Monitoring Actions*** • Conduct upstream turbidity monitoring prior to construction to determine baseline turbidity for comparison with climatic events that may occur during construction. • Conduct turbidity monitoring downstream of construction activities as a condition of the Clean Water Act Section 401 Water Quality Certification to be obtained for the project. • Install a temporary downstream turbidity monitoring station during construction to record instantaneous turbidity measurements as required for the Clean Water Act Section 404 permit/401 certification, as well as ESA Section 7 consultation documents. • Summarize all captures of ESA-listed fish in an annual report submitted to NMFS and the USFWS, as a condition of its ESA Section 10 Scientific Research Permits for steelhead and bull trout. • Record all fish species that pass through the fishway and that are collected in the juvenile screw trap as part of the NPT's overall spring Chinook supplementation program, as well as the new steelhead monitoring program (implemented by the NPT). • Comply with requirements associated with the Clean Water Act Section 404 permit granted by the USACE. • Prepare and implement a pollution and erosion control plan to prevent pollution related to construction activities that addresses equipment and materials storage sites, fueling operations, staging areas, hazardous materials, spill containment and notification, and debris management (implemented by the Contractor).
Water Resources	• Lower the weir during high flows to flush accumulated materials behind the weir and avoid impacts to instream rearing habitat. • Lower the weir during events higher than the 2-year flood recurrence and larger events to transport sediment downstream. • Employ scour countermeasures (buried large rocks) in areas where increased velocities are anticipated for bank protection to prevent any instability.
Vegetation	***General Environmental Design Features*** • Reseed disturbed banks with native herbaceous grasses to prevent the spread of noxious weeds. • Wash all construction equipment prior to leaving the site to prevent the spread of noxious weeds. • Pull noxious weeds by hand from the ROW. • Plant portions of the north bank riparian corridor with native shrubs. • Plant portions of the north bank currently dominated by reed-canary grass with 3 cedar saplings and several Sitka willow bundles. • Reseed disturbed upland areas with appropriate native species following construction.

Table 2-1. Environmental Design Features / Mitigation Measures Included as Part of the Proposed Action.

Resource	Environmental Design Feature/ Mitigation Measure
Vegetation, continued	***General Environmental Design Features, continued*** • Plant streambanks with Sitka willow bundles downstream of the weir in areas where riparian shrubs have been removed to accommodate construction equipment. • Retain the conifers removed from the south bank for future use in habitat enhancement activities undertaken by the NPT throughout the Lolo Creek watershed. ***Monitoring Actions*** • Monitor riparian enhancement areas and uplands that are reseeded following disturbance during construction annually to ensure that plants are viable and that survivability meets 90 percent for a period of 5 years (implemented by the NPT). • Replant any planted shrubs and trees that are not surviving with similar, suitable native species along the north bank (implemented by NPT).
Terrestrial Wildlife and Habitat and Special Status Species	• Install interpretive signage, if desired, that could include facts on riparian-dependent wildlife species that may be present in the vicinity of the Proposed Action. • Remove south bank conifers outside of spring nesting season, if possible.

ACEC and Wild and Scenic Rivers	• Implement measures for ACEC elements: scenic values, cultural resources, ecological resources and special status fish, wildlife and plants, as described elsewhere in this table.
	• Implement measures for ORVs related to the preliminary suitability determination for Lolo Creek.
	  • Scenic ORV – refer to Visual and Aesthetics row of this table;
	  • Recreational ORV – refer to Recreation row of this table;
	  • Fisheries ORV – refer to Aquatic Habitat and Special Status Species row;
	  • Historic ORV – refer to Cultural Resources row of this table.

Table 2-1. Environmental Design Features / Mitigation Measures Included as Part of the Proposed Action.

Resource	Environmental Design Feature/ Mitigation Measure

Recreation, including SRMA, and Transportation	• Notify recreational users of the schedule of construction activities and the potential effects on recreation activities, as follows:
	  • Post notices of proposed construction in newspapers, websites, and other social media (notices developed by BPA; posted by BLM).
	  • Post three notifications: 1) during April and May, when upland construction and staging at the site would occur, and 2) prior to the start of the August 1 instream work window.
	  • Post information in newspapers and websites, including construction schedule and timing, availability of parking, and inaccessibility of the creek from August through October of the construction year. Indicate in notices that parking and foot traffic west of the bridge would not be available during construction.
	• Install signage at the upstream face of the Lolo Creek Road/Woodland Bridge to indicate that portage is required and warn boaters of the impending downstream barrier and direct them to the north bank take-out.
	• Install boater flags above fish weir mid-March through May of each year.
	• Add two new designated parking spaces for recreational use near the downstream put-in (downstream of the weir on north bank).
	• Upload flow data from the recently-installed PIT-tag detector to a website established and maintained by the NPT which would provide real-time data on a satellite uplink so that boaters can view flows online prior to traveling to the site. The BLM would work with the American Whitewater webpage manager to establish a link to the NPT data on the American Whitewater Lolo Creek page.
	• Use dust abatement measures (e.g., watering trucks), and apply idling restrictions during construction to minimize impacts to recreational users.

Visual Quality and Aesthetics	• Match colors of all concrete and new structures to the natural surroundings per Visual Resource Management guidelines. • Install riparian corridor enhancements along the north bank through planting of several cedars and willow bundles. • Reseed disturbed areas with appropriate native species following construction.

Cultural Resources	***General Environmental Design Features***
	• Conduct all instream work in the dry behind cofferdams.
	• Access all weir components from right bank to avoid impact to historic trails
	• Install interpretive signage addressing the Nez Perce National Historic Trail and the Lewis and Clark National Historic Trail
	Monitoring Actions
	• Protect any unanticipated cultural resources discovered during construction as follows:
	  • Stop all work; cover and protect find in place
	  • Notify BLM Archaeologist, BPA Cultural Resources Specialist, and NPT Cultural Resources Specialist immediately
	  • Implement mitigation or other measures as instructed by BLM Archaeologist/NPT Cultural Resources Specialist

2.1.4 Site Reclamation

In the event that fish collection facilities are no longer needed for scientific study (as determined by NMFS and the NPT), research or monitoring purposes, a site-specific reclamation plan would be completed and approved by the BLM. The plan would likely be funded by the NPT or BPA and would include restoration needs for riparian, stream channel, water quality, fisheries, uplands, visual qualities, and recreation rehabilitation, as determined by the BLM Authorized Officer. Site reclamation actions would comply with all applicable state, federal and local regulations.

2.2 No Action Alternative

Under the No Action Alternative, BPA would not fund the permanent weir and related facilities and the BLM would deny the application to amend the existing ROW. The weir, fishway, and other facilities, including the recreational facilities and riparian enhancement, would not be constructed. However, the current NPT seasonal fish collection and monitoring practices at the existing Lower Lolo Weir site would continue (see Section 1.3.4). In addition, the site would undergo reclamation, as described in Section 2.1.4 for the Proposed Action, in the event that the existing seasonal fish collection facilities are no longer needed (as determined by NMFS and the NPT).

Implementation of the No Action Alternative would not meet the need for monitoring ESA-listed Snake River steelhead in the Clearwater River basin, specifically, Lolo Creek as required for Snake River B-run steelhead in the 2008 FCRPS Biological Opinion, as amended by a Supplemental Biological Opinion in 2010 (NMFS 2008, 2010).

2.3 Alternatives Considered but Eliminated from Detailed Study

This section describes alternatives considered and the reasons BPA and the BLM, in consultation with the NPT, eliminated the alternatives from analysis in Chapter 3 of this EA. The majority of fish data collection requires the capture and handling of returning adults. For this reason, use of other census methods, including the recently-installed fish detection system (**PIT-tag detector**) at the Lower Lolo Weir site, does not help meet a purpose of the project, which is monitoring and data collection for Snake River steelhead; it also does not allow NPT to collect spring Chinook broodstock across the entire run. Further, the existing PIT-tag array system only detects fish that have been previously tagged, which is not always the case for natural-origin Snake River steelhead.

Cessation of the trapping program would also not help meet the purpose of on-going collection of spring Chinook for NPTH broodstock, or monitoring of ESA-listed Snake River steelhead in Lolo Creek.

2.3.1 Alternate Weir Locations

As described below, three alternate weir locations in Lolo Creek were considered, but ultimately rejected. Locations outside of Lolo Creek were not considered as those would not meet the purpose of monitoring Snake River steelhead populations in Lolo Creek.

2.3.1.1 BLM Recreational Easement at RM 1

BPA, in consultation with BLM and NPT, considered a site at the mouth of Lolo Creek (River Mile [RM] 1). Although this site is privately owned, the BLM has a 2.3-acre recreational easement on the property. This site was eliminated from further analysis because the easement is not perpetual and a future lease is uncertain, and the easement specifically excludes use by the NPT. The site was also eliminated from further study because trapping at this site would likely result in the capture of more strays due to the close proximity to the Clearwater River. Because adult steelhead are known to temporarily stray into non-native streams as they migrate to spawning grounds (Peery 2008), monitoring at this location may not provide accurate information regarding use by the Lolo Creek steelhead population. For these reasons,

BPA concluded construction of the permanent weir at this location would not meet the purpose of providing additional status monitoring of B-run steelhead.

2.3.1.2 Roeter's Bridge at RM 24.2

BPA, in consultation with BLM and NPT also considered another site for development of a permanent fish collection facility near Roeter's Bridge on Lolo Creek (RM 24.2). BPA eliminated this site from further consideration because, although the site has a primitive four-wheel-drive road that crosses Lolo Creek, it is not maintained by either Clearwater or Nez Perce Counties. The site would not be accessible by the NPT fish transport truck or staff trailers, which are necessary to house staff to support 24-hour weir operations without road widening and installation of utilities (electricity and phone service). The site would not be accessible by the sanitation truck, which is necessary to provide sanitation (human waste) services on site for staff. This site would also result in substantially more impacts on riparian resources, including the removal of many mature conifers. For these reasons, BPA concluded construction of the permanent weir at this location would not meet the purpose of minimizing environmental effects.

2.3.1.3 Bradford Bridge at RM 29.2

BPA, in consultation with BLM and NPT also considered a site located at Bradford Bridge (RM 29.2). This site was eliminated from consideration because the NPT, during past fish trapping at this site, observed high numbers of spawning spring Chinook, and high quality habitat for steelhead. Due to the potential for impacts to heavily utilized salmonid spawning habitat (salmon **redds**), construction of a permanent weir at this location would not meet the purpose of minimizing environmental effects.

2.4 Comparison of Alternatives

Table 2-2 compares how well the alternatives meet the project purposes as defined in Chapter 1. Table 2-3 summarizes and compares the potential environmental consequences of the alternatives. See Chapter 3 for a full discussion of environmental consequences.

Table 2-2. Comparison of the Proposed Action and No Action Alternative, and Methods by Which they Meet the Purposes of the BPA and the BLM

Purpose	Proposed Action	No Action Alternative
BPA Purposes		
Act consistently with all applicable federal laws, regulations, and policies that guide the agency	The Proposed Action is consistent with applicable laws, regulations, and policies.	The No Action Alternative is consistent with applicable laws, regulations, and policies; however, it does not address the recommendations of the FCRPS BiOp and supplements relative to the collection of Snake River B-run steelhead in Lolo Creek.
Support efforts to mitigate for effects of the Federal Columbia River Power System (FCRPS) on fish and wildlife in the mainstem Columbia River and its tributaries pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16U.S.C. 839b(h)(10)(A))	The Proposed Action would support the efforts of the FCRPS by enhancing fish monitoring and data collection in the Lolo Creek drainage area.	The No Action Alternative would not provide enhanced fish monitoring or data collection capabilities in the Lolo Creek drainage area. Collection facilities would not be in place during the spring steelhead run, and information on this species would not be obtained.
Seek to fulfill commitments to implement the pertinent Reasonable and Prudent Alternatives (No. 50.5) listed for Snake River B-run steelhead in the 2008 FCRPS Biological Opinion, as amended by a Supplemental Biological Opinion in 2010 (NMFS 2008; 2010). Specifically, "provide additional status monitoring to ensure a majority of Snake River B-Run steelhead populations are being monitored for population productivity and abundance"	The Proposed Action would provide the capability for additional status monitoring of Lolo Creek steelhead populations.	The No Action Alternative would not provide the capability to monitor Lolo Creek steelhead populations because the existing seasonal weir cannot be installed during the spring, when steelhead adults migrate into Lolo Creek.
Minimize environmental effects	Please see Table 2-3 for a comparison of the environmental effects of the alternatives.	Please see Table 2-3 for a comparison of the environmental effects of the alternatives.
Act in a cost-effective manner	Environmental review, design and engineering, and construction costs are estimated at $1.1 million. The Proposed Action would incur maintenance costs; these costs are anticipated to be slightly higher than those associated with the No Action Alternative.	The No Action Alternative would avoid construction costs. The No Action Alternative would result in maintenance costs of approximately $73,000 per year.
BLM Purposes		
Act consistently with all applicable federal laws, regulations, and policies that guide the agency, including the Endangered Species Act, Federal Land Policy and Management Act, National Wild and Scenic Rivers Act, and Clean Water Act	The Proposed Action is consistent with applicable laws, regulations, and policies.	The No Action Alternative is consistent with applicable laws, regulations, and policies; however, it does not address the recommendations of the FCRPS BiOp and supplements relative to the collection of Snake River B-run steelhead in Lolo Creek.
Support the ongoing supplementation program for spring Chinook salmon by the NPT	The Proposed Action would fully support the on-going NPT	The No Action Alternative partially supports this program;

Purpose	Proposed Action	No Action Alternative
	spring Chinook supplementation program, and would enable improved collection of broodstock over the entire run; this would maximize the genetic diversity of broodstock for the program.	however, the inability to install the weir during high flow periods at the beginning of the run precludes collection of fish across the run, thereby reducing the genetic diversity of broodstock.
Ensure that the construction and NPT's operation of the weir does not measurably alter the Outstandingly Remarkable Values of Lolo Creek	With implementation of environmental design features and mitigation measures, the Proposed Action would not measurably alter ORVs designated for Lolo Creek.	The No Action Alternative would allow the continued operation of the temporary weir. This weir was considered in baseline for the Cottonwood RMP and ORV designations for Lolo Creek. The existing weir, when present, adversely affects the scenic ORV in this reach of Lolo Creek (BLM 2006).
Maximize benefits while minimizing adverse environmental effects to water quality and aquatic resources, and allow for recreational users to continue enjoying the benefits of Lolo Creek	Please see Table 2-3 for a comparison of the environmental effects of the alternatives.	Please see Table 2-3 for a comparison of the environmental effects of the alternatives.

Table 2-3. Summary of Impacts of the Proposed Action and No Action Alternative.

Environmental Resource	Proposed Action	No Action Alternative
Aquatic Habitat and **Special Status Species**	Construction would result in short-term increased sedimentation, though it would be limited due to the cobble nature of substrate. Construction would also displace fish from the instream work area temporarily, though salmonid use of the immediate project reach is limited during hot summer months. Fish salvage during dewatering process would result in ***moderate*** short-term impacts to handled fish. The new weir would result in up to an additional five months of operation (e.g., handling, capturing/trapping) and would operate January through October and the current weir operates from May – September). The presence of instream facilities would permanently reduce rearing habitat along stream margins and a low amount of potential spawning substrate for salmonids. However, minor backwatering during high flow operational periods could increase stream margin, low velocity rearing habitat in the 150 feet reach of the creek from the new weir to the Lolo Creek Road/Woodland Bridge. During extreme low flow periods (10cfs or less), migration would be restricted to the low flow notch on the north (right) bank. Thus, the impact to aquatic habitat and special status species from the Proposed Action would be ***low to moderate***. The Proposed Action would not result in an adverse long-term effect to the fish Outstandingly Remarkable Value. Refer to Biological Assessment (BLM and HDR 2012) and Appendix B (Wild and Scenic Section 7 Analysis) for additional information and analysis regarding Aquatic Habitat and Special Status Species.	On-going effects to aquatic habitat and resources would continue due to seasonal installation of the temporary fish weir from May through September. Effects would include temporary sedimentation associated with installation and removal of the weir, handling of fish at the existing trap, and migratory delay of all upstream and downstream migrants that are too large to pass through the weir. The impact to aquatic habitat and special status species from the No Action Alternative would be ***low***.
Water Resources	Construction would cause short-term effects on water quality and quantity associated with instream construction and dewatering. Operational effects would include effects on **hydraulics** and **hydrology** of Lolo Creek, including minor changes in streambed and water surface elevation, and slightly increased backwatering behind the weir, compared to the No Action Alternative. The impact on water resources from the Proposed Action would be ***low.*** The Proposed Action would be designed to maintain the free-flowing nature of Lolo Creek. Refer to Biological Assessment (BLM and HDR 2012) and Appendix B (Wild and Scenic Section 7 Analysis) for additional information and analysis regarding Aquatic Habitat and Special Status Species.	Ongoing operational effects associated with the existing seasonal weir would continue, including minor backwatering associated with the weir structure and minor turbidity associated with seasonal weir removal and installation. The impact to water resources from the No Action Alternative would be ***low***.
Vegetation and Wetlands	Vegetation Communities: Construction of the Proposed Action would have direct temporary (short-term) and permanent (long-term) effects on vegetation communities in the analysis area. Direct effects would occur through the removal of or disturbance to existing vegetation during grading and construction of new facilities. Along the north bank, the Proposed Action would directly affect about 50 linear feet of streambank occupied by immature native communities of thinleaf alder/deciduous shrub riparian habitat. Along the south bank, up to three mature conifers would be removed due to placement of weir abutments. With implemented project design features, the proposal will not result in the introduction of new weed species or spread of the existing spotted knapweed. Effects to vegetation due to operation and maintenance under the Proposed Action are	Ongoing operational effects associated with installation and removal of the existing seasonal weir would continue, which could include effects to vegetation in disturbed and riparian habitats on the north bank of Lolo Creek, and possible spread of non-native plant species due to the established presence of reed canary grass. The impact to vegetation from the No Action Alternative would be ***low***.

Table 2-3. Summary of Impacts of the Proposed Action and No Action Alternative.

Environmental Resource	Proposed Action	No Action Alternative
	anticipated to be **low**, and limited to increased human activity on disturbed/developed land in the vicinity of the fish collection facility and for periodic maintenance. There are no known occurrences of rare, threatened, or endangered species in the analysis area; the Proposed Action is likely to have **no** effect to special-status plant species. Wetlands: There would be no direct temporary or permanent effects to wetlands in the analysis area as a result of construction or operation of the Proposed Action. However, the designated kayak put-in area will directly affect an emergent wetland on the north bank of Lolo Creek through an increase in vegetation damage and soil compaction due to increased pedestrian traffic. These impacts are considered to be **low** due to the small size of the affected area (estimated 10 feet wide corridor for boater access) and the limited number of boaters that are expected to traverse the put-in location (about 15 people per year reportedly run the creek [BLM undated]).	There would be **no** impacts on wetlands from the No Action Alternative.
Terrestrial Wildlife Habitat and Special Status Species	Construction and operational activities associated with the Proposed Action could result in short-term direct and indirect effects on wildlife resulting from the loss, modification, and degradation of habitats, and human disturbance, including construction noise. These effects would be **low** due to the relatively small area affected, and limited amount of high-quality habitat loss. Vegetation removal would not cause fragmentation of communities since the site is already disturbed and vegetation to be cleared is located along the outer edge of large tracts of similarly-vegetated areas on both banks. Only three mature trees would be removed from the 2.4-acre project footprint, and the surrounding habitat is densely forested with mature conifers on both banks of the Lolo Creek canyon. A slight increase in human presence during the extended weir operational period would result in **low** levels of effect to wildlife species, including BLM **sensitive species**.	Ongoing operational effects associated with installation and removal of the existing seasonal weir would continue, which could include **low** level effects to vegetation in disturbed and riparian habitats on the north bank of Lolo Creek, and human activity that could cause **low**, temporary impacts to wildlife.
Special Designations - ACEC and Wild and Scenic Rivers	Construction and operational effects to the Lolo Creek ACEC would be similar to those described for individual resources included in the designation: scenic values (see Visual Quality and Aesthetics), cultural resources, ecological resources and special status fish, wildlife and plants (see Aquatic Habitats and Special Status Species, Water Resources, Vegetation and Wetlands, and Terrestrial Wildlife Habitat and Special Status Species). The Proposed Action would not result in direct or adverse long-term effects to the fish Outstandingly Remarkable Value (ORV). The historic ORV would be enhanced by on-site interpretive panels discussing the historic value of the local fish and aquatic habitat, the use of fish weirs by NPT and historical information on the Lewis and Clark and Nez Perce Trails. The trails would not be physically affected during construction. The Proposed Action is anticipated to have a **low** effect on the scenic ORV of Lolo Creek due to removal of up to three mature trees and the addition of permanent structures at the project site. The Lolo Creek Road/Woodland Bridge, NPT seasonal weir and juvenile screw trap were present during the suitability determination for Lolo Creek under the National Wild and Scenic River System (NWSRS). The Proposed Action is anticipated to have a **low** effect on the recreation ORV of Lolo Creek. The expanded weir operational timing would slightly increase the effect to spring-time	Ongoing operational effects to ACEC and Wild and Scenic River ORVs associated with the seasonal weir would continue, including scenic degradation due to the presence of the weir, recreational boater effects during the spring portion of weir operations, and migratory fish delay. The impact to ACEC and Wild and Scenic River ORVs from the No Action Alternative would be ***low***.

Table 2-3. Summary of Impacts of the Proposed Action and No Action Alternative.

Environmental Resource	Proposed Action	No Action Alternative
	recreational boaters since the weir would typically be raised when boaters typically run the creek. However, proposed mitigation (recreational parking on-site, designated take-out and put-in, and real-time flow data) would lessen these effects.	
Recreation	Construction would have **low** to **moderate** short-term effects on recreation by prohibiting recreation access to the immediate project area during construction activities. However, boaters do not typically run the creek during the instream work window (August – October) due to low flows. Construction could temporarily displace some recreational users from the project area. This displacement of recreational users could increase pressure on recreational use elsewhere in the analysis area, resulting in a short-term indirect effect on other recreation areas. Operation of the project would have **low** effect on recreation through the loss of approximately 100 feet of boating area. The Proposed Action would not result in an adverse, long-term effect to the recreation Outstandingly Remarkable Value of Lolo Creek. The Proposed Action would have short-term effects on recreation opportunities by restricting fishing and swimming access at the construction site. The Proposed Action would enhance recreation opportunities by designating recreational parking and a footpath boater launch area, improving restroom facilities and adding interpretive information. Thus, the impact on recreation from the Proposed Action would be ***low to moderate*.**	Ongoing operational effects associated with the existing seasonal weir would continue; recreational improvements such as the addition of public restroom, designated recreational parking and the put-in and take out would not be made. The impact to recreation from the No Action Alternative would be ***low***.
Transportation	Construction would have a **low** effect on transportation including increased traffic, restriction of access to the project site, and loss of parking. These effects would be short-term in nature and limited to the construction period. Operation of the Proposed Action would have a **low** effect on transportation due to an increase in daily trips compared to the existing operations, since the facility would be operated on a year-round basis (e.g., from five months seasonally to 12 months annually). Transportation by a sanitation company would decrease from once a month to once every 2-3 years.	Ongoing operational effects associated with the existing weir would continue, which would include minor traffic to and from the seasonal weir site. The impact to transportation from the No Action Alternative would be ***low***.
Visual Quality and Aesthetics	Construction would have a short-term **low** to **moderate** effect on visual quality and aesthetics due to the presence of construction equipment and materials and noise associated with construction activities at the project site. The completed project facilities would have a **low** effect on visual quality and aesthetics associated with the permanent weir and associated structures. The Proposed Action is anticipated to have a **low to moderate** effect on the scenic Outstandingly Remarkable Value (ORV) of Lolo Creek due to removal of up to three mature trees and the addition of permanent structures at the project site. The Lolo Creek Road/Woodland Bridge, NPT seasonal weir and juvenile screw trap were present during the suitability determination for Lolo Creek under the NWSRS. The Proposed Action would decrease the existing visual impacts of the seasonal fish weir by replacing the existing tents and trailers with permanent structures designed with structures and textures similar to the surroundings.	The existing seasonal weir and permanent facilities would continue to have a **low** effect on visual quality and aesthetics in the analysis area; there would be **no** effect to the scenic ORV as these facilities were present during the suitability determination for Lolo Creek under the NWSRS.
Cultural Resources	The Proposed Action is expected to result in a **low** to **moderate** short-term effect during	The No Action Alternative would

Table 2-3. Summary of Impacts of the Proposed Action and No Action Alternative.

Environmental Resource	Proposed Action	No Action Alternative
	construction on cultural resources due to the visual intrusion on the Lewis and Clark Trail and the Nez Perce Trail. However, there would likely be no long term effect to known cultural or historic properties during construction or operation. The historic character would be enhanced by on-site interpretive panels discussing the historic value of the local fish, the use of fish weirs by NPT, and historical information on the Lewis and Clark and Nez Perce Trails. **No** effect to archaeological resources is anticipated.	continue to have **no** effect on cultural resources and **low** visual effect on the historic ORV of Lolo Creek.

Chapter 3
Affected Environment, Effects of Alternatives, and Mitigation Measures

3.1 Introduction

This chapter includes an analysis of the potential effects of the Proposed Action and the No Action Alternative on the human and natural environment. Each section of this chapter includes a description of the potentially affected environment for a specific resource and an analysis of the impacts on that resource. The analysis includes relevant short-term and long-term effects, as well as cumulative impacts, and discloses both beneficial and detrimental effects. For purposes of this analysis, "short-term" refers to the period of time during which the proposed project is under construction and "long-term" refers to the period of time after construction during which effects from the proposed project could still affect the environment.

The degree to which resources could be affected by the Proposed Action are discussed in the following subsections:

- Aquatic Habitat and Special Status Species
- Water Resources
- Vegetation and Wetlands
- Terrestrial Wildlife Habitat and Special Status Species
- Special Designations – Area of Critical Environmental Concern (ACEC) and Wild & Scenic River System (NWSRS)
- Recreation (including Lolo Creek Special Recreation Management Area [SRMA])
- Transportation
- Visual Quality and Aesthetics
- Cultural Resources

Each subsection includes discussion of the following topics:

- Affected Environment (current condition) of the resource or use
- Effects (direct and indirect) of the Proposed Action and No Action Alternatives
    - Direct effects are caused by the Proposed Action and occur at the same time and place
    - Indirect effects are caused by the Proposed Action and are later in time or farther removed in distance, but are still reasonably foreseeable

Four effect levels were used—high, moderate, low, and no effect— to describe effects from construction and operation activities. High effects are considered to be significant effects to a resource that alters its use or condition. Typically, low effects can be largely mitigated. Moderate effects can usually be partially mitigated through implementation of the environmental design features/mitigation measures to reduce the impacts of the Proposed Action, as described in Section 2.1.3 of this EA. Cumulative effects, which result from the incremental effects of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, are discussed in Section 3.12.

The resources that were dismissed from detailed analysis because they were either not present or would not be measurably affected include air quality, socioeconomics, groundwater, environmental justice, prime or unique farmlands, and wilderness areas.

The "project area" includes the existing NPT ROW for the seasonal fish weir. The geographic "analysis area" varies by the resource being considered and is presented in the introduction to each resource discussion. Table 2-3 summarizes the potential effects to each resource as a result of the Proposed Action. The timeframe of analysis assumes construction from April – December, and operation of the new weir for an undefined period of time, which would depend upon the recovery of Snake River steelhead and spring Chinook in the Lolo Creek drainage.

3.2 General Setting

The Proposed Action would occur on a ROW granted to the NPT by the BLM in the Lolo Creek watershed near RM 12 of Lolo Creek (Figure 1-1). This ROW is currently used by the NPT to operate a seasonal fish trapping facility, known as the Lower Lolo Weir. Lolo Creek (fifth field hydrologic unit code 1706030616) is approximately 42 miles long and flows into the Clearwater River at RM 54.1 (Espinosa 1984). The creek flows in a west/northwesterly direction within a narrow, V-shaped canyon through elevations ranging from approximately 1,100 to 3,660 feet (Mancuso 1996). The Lolo Creek watershed is roughly 156,000 acres in size, with headwaters in the Hemlock Butte area on the Clearwater National Forest (CNF) (Clearwater Soil and Water Conservation District et al. 1993). The lowermost 0.5 miles of Lolo Creek canyon is privately owned. The BLM manages most of the canyon corridor between approximately river mile 0.5 and 7.5. Continuing upstream to the CNF boundary is a combination of private, BLM and CNF lands. The lands of critical environmental concern in the Lolo Creek drainage include high scenic, recreational, and cultural values as well as habitat for ESA-listed and other special status species (plants, fish and wildlife). Important recreational values include white water boating, camping, swimming, and scenic sightseeing.

3.3 Aquatic Habitat and Special Status Species

The analysis area for aquatic habitat is the Lolo Creek drainage within the Clearwater River Basin due to the potential for migratory delay to fish during operation of weir. Lolo Creek provides designated critical habitat for one ESA-listed fish species (Snake River steelhead), and is occupied by two ESA-listed fish species (steelhead and bull trout), four BLM sensitive fish species (Chinook salmon, westslope cutthroat, redband trout, and Pacific lamprey), and numerous other native and non-native fish species. Issues addressed in this section include temporary effects to aquatic species and riparian habitats during instream construction in the project area (vicinity of Lower Lolo Weir), and permanent effects to aquatic/riparian habitat and species in the aquatic analysis area due to long-term operation of the Lolo Creek weir and trapping facility.

3.3.1 Affected Environment

3.3.1.1 Aquatic Habitat

General Habitat in Lolo Creek Drainage

Aquatic habitat within the analysis area has been altered by legacy mining, grazing, road construction, and timber harvest. These actions have resulted in channel alterations that have affected important habitat parameters including the amount of large woody debris (LWD) available for instream recruitment, and the quantity of instream boulders. These elements influence the formation of pools and **riffles**. Pools provide valuable rearing habitat for young fish, and riffles and the tail ends of pools provide spawning habitat for fish and habitat for aquatic insects (USFS 2009). The nature of instream substrate also influences the quality and quantity of spawning and rearing habitat. Clean gravels, free of fine sediments, are typically preferred for salmonid and lamprey spawning, though sandy substrates are preferred by aquatic species like mussels.

Surveys conducted by the CNF and reported by NMFS indicate that a number of streams within the Lolo Creek drainage are characterized by fair-poor substrate conditions, fair-good riparian conditions, and fair rearing habitats (NMFS 2009b). The primary limiting factor for salmonid production in the lower reaches of Lolo Creek is high summer water temperature, which often approaches lethal temperatures for cold-water fish species (Table 3-1). Thermal barriers for bull trout (*Salvelinus confluentus*) occur when temperatures exceed 15 degrees Celsius (°C), and habitat for steelhead and Chinook is considered low quality when temperatures exceed 15.5°C during spawning, and 17.8°C during rearing and migration.

Table 3-1. Mean Monthly Instream Temperatures from August - October, as Measured at the NPT Gage on the Lolo Creek Road/Woodland Bridge.

Year	Month					
	August		September		October	
2005	20.1°C	68.2°F	14.0°C	57.2°F	8.4°C	47.1°F
2006	19.7°C	67.5°F	14.0°C	57.2°F	7.6°C	45.7°F
2007	19.4°C	66.9°F	14.3°C	57.7°F	8.2°C	46.8°F
2008	19.6°C	67.3°F	14.0°C	57.2°F	7.7°C	45.9°F
2009	20.1°C	68.2°F	15.8°C	60.4°F	7.2°C	45.0°F

°F = degrees Fahrenheit; NPT 2011

Pool quality is generally good in the Lolo Creek drainage, but the quantity of pools is below optimal levels (USFS 2011). Banks are very stable; however, the amount of LWD is low, and is typically well below ideal standards for LWD in the Clearwater Basin in North-central Idaho (BLM et al. 1997). The U.S. Forest Service reported that substrate in Lolo Creek is dominated by cobble and larger substrates (83 percent), followed by gravel (12 percent) and sand and silt (5 percent) (USFS 2009). Although larger substrate provides ideal rearing habitat, it limits available spawning habitat for steelhead, Chinook salmon and resident cutthroat trout. The large size of the substrate limits spawning habitat for steelhead to 12 percent of the area, Chinook spawning to 9 percent of the area and just 2 percent to resident cutthroat trout (USFS 2009).

Peak flows in Lolo Creek coincide with snowmelt and typically occur from April through June. Flows decrease during late July and August, with base flow levels normally reached from August through October. Relatively low flows persist through February.

Habitat in Project Area

Within the project area, instream substrate is dominated by large boulders, with several very large bedrock fracture boulders present immediately downstream of the Lolo Creek Road/Woodland Bridge. Gravels and cobbles present are generally larger than two inches in diameter. Based on the large size of the dominant substrate in the project area it is estimated that less than 5 percent of the area would provide suitable salmonid spawning habitat (BLM and HDR 2012). The 150-foot reach between the bridge and the proposed weir location is classified as **run** habitat, and is swiftly flowing with little turbulence. Pools are generally lacking in the reach; however, two pools are present, one immediately under the bridge, and another approximately 200 feet downstream of the weir near a bedrock outcropping on the north bank.

The flat north bank of the creek (right bank, looking downstream) has been heavily disturbed and appears to have been historically used as a landing due to the presence of quarry spalls and fill material. Riparian vegetation is sparse immediately downstream of the bridge for approximately 75 feet. Further downstream, a thin band of immature multi-branching thinleaf alder (*Alnus incana*) dominates the riparian community along the heavily disturbed bank. The north bank riparian community does not provide substantial shading benefits to the creek. During lower flow periods, extensive gravel bars are exposed along the bank. These gravel bars provide substrate for invasive reed canarygrass (*Phalaris*

arundinacea). Compared to the south bank, which is well-defined, the north bank contains an artificially created floodplain (due to disturbance and fill).

The south bank immediately downstream of the bridge is characterized by grasses, shrubs and immature trees (multi-branching alder) atop relatively well-drained alluvial material, including large cobbles and small boulders. Thimbleberry (*Rubus parviflorus*), common snowberry (*Symphoricarpos albus*), and reed canarygrass occur along the bank. A small (5-8 feet wide), cobble-lined intermittent stream enters Lolo Creek just upstream of the proposed weir location. This intermittent stream appears to collect water from the adjacent bedrock hillside to the left and Lolo Creek Road to the right. It has a high gradient and is dominated by large cobbles and gravels, though sands and small gravels are present near the confluence with Lolo Creek. Due to the relatively high gradient, it is unlikely that juvenile salmonids utilize the system extensively during low flows; however, lower portions of the side channel may be used by juvenile salmonids as off-channel rearing habitat/**refugia** during high flow events.

In the vicinity of proposed south bank weir abutments, the bank is dominated by large boulders and vegetated bedrock outcroppings. Bedrock forms a steep bank landward of the creek, and the canyon wall is covered in moss and dense forest vegetation including trillium, moss, sword fern, maidenhair fern and shade-producing western red cedar.

In the project area, instream temperatures are highly elevated during summer months. Table 3-1 presented average instream temperatures during the instream work window established for this project (August 1 – October 31). Temperatures were recorded at the Lolo Creek Road/Woodland Bridge, just upstream of the proposed weir location from 2005-2009.

In 2005, the NPT installed a flow gage on the Lolo Creek Road/Woodland Bridge, just upstream of the temporary weir location. Table 3-2 depicts average monthly flows in Lolo Creek as measured at the NPT Lolo Creek Road/Woodland Bridge gage located approximately 50 feet upstream of the temporary weir location.

Table 3-2. Lolo Creek Average Monthly Flows (cfs) as Measured at Lolo Creek Road/Woodland Bridge (2005-2009).

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Mean monthly flow (cfs)	285.3	196.3	465.8	760.6	737.9	380.5	67.7	33.6	24.4	36.2	106.4	232.8

Source: NPT 2011

3.3.1.2 Aquatic Species

Lolo Creek provides aquatic habitat for native and non-native fish species. Native fish species include **anadromous** and resident salmonids that are ESA-listed or are BLM-sensitive species. The drainage provides spawning and rearing habitat for steelhead trout, spring/summer Chinook salmon, and westslope cutthroat trout (*Oncorhynchus clarki lewisi*). Other fish species documented to occur in the drainage include: brook trout (*Salvelinus fontinalis*), mountain whitefish (*Prosopium williamsoni*), smallmouth bass (*Micropterus dolomieu*), northern pikeminnow (*Ptychocheilus oregonensis*), chiselmouth (*Acrocheilus alutaceus*), redside shiner (*Richardsonius balteatus*), longnose dace (*Rhinichthys cataractae*), speckled dace (*Rhinichthys osculus*), redband trout (*Oncorhynchus mykiss gairdneri*), Pacific lamprey (*Entosphenus tridentatus*), and sculpin. Lolo Creek is also **Essential Fish Habitat** (EFH) for Chinook and coho (*Oncorhynchus kisutch*) salmon, though coho are no longer believed to be present in the drainage as the NPT has not observed them during any trapping operation from 2002 to the present. EFH is defined as those waters and substrate currently and historically accessible to fish, where they can spawn, breed, feed or grow to maturity.

The timing of various life-history stages for ESA-listed species and several BLM sensitive species in the Lolo Creek drainage is presented in Table 3-3.

Table 3-3. Timing of ESA-Listed and Several BLM-Sensitive Species in Lolo Creek

Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Steelhead[1] (ESA Threatened)												
Adult Migration												
Kelt **Emigration**												
Spawning												
Emergence												
Juvenile Migration												
Juvenile Rearing[2]												
Bull Trout (ESA Threatened)												
Adult/sub Migration[3]												
Adult Spawning[3]												
Emergence[3]												
Juvenile Rearing[4]												
Spring Chinook (BLM Sensitive)												
Adult Migration												
Adult Spawning												
Emergence												
Juvenile Rearing												
Juvenile Migration												
Cutthroat Trout (BLM Sensitive)												
Adult/subadult Migration												
Adult Spawning												
Emergence												
Juvenile Rearing												
Pacific Lamprey (BLM Sensitive)												
Adult/subadult Migration												
Adult Spawning												
Emergence												
Juvenile Rearing[5]												
Fall Chinook – not present in Lolo Creek drainage; individuals may dip into creek near confluence with the Clearwater River, 12 RM downstream of the project area.												

Represents peak level of use.

Represents lesser level of use.

Represents known presence with uniform or unknown level of use.

Notes: [1] Steelhead timing obtained from estimates presented in NMFS 2009b [2] Temperatures in project area often exceed 25°C in July/August; rearing likely low due to thermal barrier; some upwelling may produce pockets of habitat with suitable temperatures. [3] Occurrence of fluvial bull trout is rare, only a few individuals have been observed at the weir in the past 10 years (Sprague 2011a); individuals spawn well upstream of the project area near the headwaters. [4] Juvenile rearing may occur in project area; however, primary spawning is upstream of the weir, and temperatures in the summer to early fall (instream work window) likely preclude use of the project area by rearing juveniles. [5] Juvenile rearing is very unlikely to occur in project area; they prefer soft muddy/silty areas, which are located much higher in the drainage.

ESA-Listed Fish

Two ESA-listed fish species occur in Lolo Creek: Snake River steelhead and Columbia River bull trout.

Steelhead

The Snake River steelhead **Distinct Population Segment** (DPS) is under the jurisdiction of NMFS. Snake River steelhead are ESA-listed as **threatened**, and NMFS has designated Lolo Creek as **critical habitat** for the DPS, because it provides spawning and rearing habitat. Juveniles use Lolo Creek as an outmigration corridor to the Clearwater River, and adults use the creek as a migratory corridor to and from spawning grounds.

Occurrence in Lolo Creek Drainage

Steelhead reportedly spawn in mainstem Lolo Creek, typically from Musselshell Creek (RM 26) to Yoosa Creek (RM 36) (USFS 2009). The precise timing of Lolo Creek steelhead spawning and emergence of juveniles from redds is not known. Based on counts of adult returns to Fish Creek (the drainage adjacent to Lolo Creek headwaters) and two observations of adult returns to Lolo Creek, spawn timing likely occurs in mid-April to early June (NMFS 2009b) (Table 3-3). Following spawning, eggs typically incubate for approximately 35 to 50 days (USFS 2009). Juveniles emerge from the gravel after another few weeks, with emergence timing estimated as July 1 to July 17 (NMFS 2009a). Following emergence, juveniles move to protected edge habitats, such as vegetated stream margins and overhanging banks with low velocities, typically less than 15 inches deep (USFS 2009). Juveniles rear throughout the mainstem, though densities are low and more rearing habitat is likely available than fish to utilize available habitat (USFS 2009).

Occurrence in Project Area

Due to high instream flows and associated turbidity during the spring spawning period, it is unknown if steelhead spawn in the vicinity of the Lower Lolo Weir. In the immediate footprint of the Proposed Action, spawning-sized gravels are limited as the substrate is dominated by very large cobbles and boulders. However, small pockets of suitable gravel do occur in the project area. NPT weir operators have not observed steelhead spawning at the Lower Lolo Weir site; however, spawning begins prior to seasonal weir installation and the creek is often too turbid to observe fish (Sprague 2011c). Steelhead have been observed spawning in Lolo Creek from the mouth to the headwaters (Sprague 2011c). As a result, spawning could occur in the project area.

Although the existing seasonal weir does not operate during the early spring when adult steelhead are migrating and spawning, no adult steelhead, including kelts, have been collected or observed at the Lower Lolo Weir during operations in May and June from 2002 to 2011 (Sprague 2011c). Even so, based on typical migration timing, adults, including kelts, may be present in the vicinity of the existing weir from February through July. The NPT have observed 10 to 15 steelhead kelts at their upper weir site on Lolo Creek (~RM 24) over the past 10 years, and they have captured two to three kelts over the same time period in the existing juvenile screw trap in the project area (Sprague 2012a).

Rearing juveniles may occupy side channels and complex pool habitats created by wood and boulders throughout the project area during spring, fall and winter months when instream temperatures are suitable. However, temperatures during the summer, including the first month of the instream work window (August), likely preclude juvenile rearing in the project area. In 2007, temperature readings on instream gages maintained by the NPT at the Lolo Creek Road/Woodland Bridge approached 26°C (78.8°F) in mid-July. During the beginning of the instream work window in August, temperatures from 2005-2009 averaged well above optimal for steelhead spawning, rearing and migration (Table 3-3). High quality habitats are those with instream temperatures below 14°C (BLM et al. 1997). Based on these conditions, it is unlikely that juveniles rear in the project area during the onset of the instream work window, and portions of the summer/early fall operational period (mid July – mid September).

Bull Trout

The Columbia River DPS of bull trout is under the jurisdiction of the USFWS, and is ESA-listed as threatened. Adult and **subadult** bull trout are believed to use Lolo Creek, though documented occurrences are very limited. Spawning has not been documented, but suitable spawning habitat is present in upper Lolo Creek (USFWS 2002). Lolo Creek was not included in the final designation of critical habitat for bull trout (USFWS 2010a, 2010b).

Occurrence in Lolo Creek Drainage

The Lolo Creek drainage was likely within the historical range of bull trout, but the populations have since been reduced to a few individuals (USFS 2011). Habitat conditions and warm temperatures limit bull trout production in the drainage. Very few bull trout have been observed during snorkeling and electrofishing surveys conducted from 1974 to 2007 (USFS 2011). A total of 21 bull trout have been observed during USFWS, BLM, IDFG and NPT monitoring efforts in the mainstem Lolo Creek and at the NPT's juvenile trapping facility (upstream of Eldorado Creek) in 1987, 1990, 1993-1995, 1998-2000, and 2003-2010 (USFS 2011). A summary of the available fish population data shows that between 1985 and 2007, bull trout juveniles or subadults were observed at only 11 of 675 snorkel stations surveyed within the mainstem Lolo Creek. No bull trout have been documented in 363 monitoring stations located in tributary streams (USFS 2011).

The extent of bull trout spawning and production is assumed to be low to nonexistent (USFS 2011). Bull trout juveniles or subadults have been documented in Lolo Creek upstream of a small falls upstream of the project area (USFS 1999). The presence of these fish upstream of a feature that would act as a barrier to upstream migration may indicate a local population of bull trout in Lolo Creek. Due to the observation of juveniles in Lolo Creek, it is presumed that spawning occurs in the system; however, spawning and rearing has not been documented (USFS 2001, Clearwater Basin Bull Trout Technical Advisory Team [CBBTTAT] 1998 as cited in USFS 2009). Suitable spawning habitat is present in tributaries of upper Lolo and Yoosa creeks (USFWS 2002).

Bull trout timing and use of Lolo Creek is shown in Table 3-3. Although spawn timing is presented in the table, spawning has not been documented in the drainage.

Occurrence in Project Area

Bull trout would be expected to use Lolo Creek for subadult and adult foraging, though current use is likely at low levels (Johnson 2012). No bull trout have been observed spawning in the vicinity of the weir (Sprague 2011b). Only two adult bull trout have been observed at the Lower Lolo Weir over the current weir's operational period (mid-May through September, 2002 to present): one on June 12, 2003, and another on August 30, 2004 (Sprague 2011b).

Since 2002, 11 bull trout juveniles and subadults have been collected at the NPT juvenile screw trap, which is annually installed near the Lolo Creek Road/Woodland Bridge in the spring and early fall. However, due to high instream temperatures, potential juvenile rearing is unlikely to occur in the vicinity of the Lower Lolo Weir during the instream work window established for this project (August 1 – October 31).

BLM Sensitive Fish

The BLM maintains a Sensitive Species List for plants and animals present on BLM-managed lands. **Sensitive species** are those that the BLM has determined may be in danger of rapidly dwindling to extinction. These species are managed to ensure that BLM actions will not contribute to a trend toward federal listing or cause a loss of viability to the population. Sensitive aquatic species that occur in the Lolo Creek drainage include spring/summer Chinook salmon, westslope cutthroat trout, Pacific lamprey (*Entosphenus tridentatus*), and redband trout.

Spring/Summer Chinook

Spring/summer Chinook salmon occur in Lolo Creek; however, they are not ESA-listed in the Clearwater River Basin. The Idaho portion of the Snake River spring/summer Chinook salmon **Evolutionarily Significant Unit** (ESU) consists of all of the Salmon River drainage and the Snake River drainage upstream to Hells Canyon Dam. The Clearwater drainage was not included due to loss of this population in the 1950s (IDFG 2005). Lolo Creek spring Chinook typically spawn on large substrate (three to six inch diameter) in low gradient habitats upstream of the USFS boundary, approximately 10 RM upstream of the Lower Lolo Weir location (USFS 2009). Juvenile rearing occurs throughout Lolo Creek and a few of its tributaries, typically in pools. The NPT has managed on-going spring Chinook supplementation efforts in Lolo Creek over the last ten years.

Westslope Cutthroat Trout

Westslope cutthroat are known to spawn and rear in the upper Lolo Creek drainage, typically in tributary habitats that are not occupied by steelhead (USFS 2008 as cited in USFS 2009). However, westslope cutthroat have only been observed in the mainstem of Lolo Creek upstream of the CNF project area (10 miles upstream of the Lower Lolo Weir) (USFS 2009). They spawn downstream of pools and in small pockets with 0.5- to 2-inch diameter gravels; they rear in pools, along stream margins, and in pocket water habitats (USFS 2009). The Lower Lolo Weir site does not contain suitable spawning gravel for westslope cutthroat trout as substrate consists of large cobbles and boulders.

Pacific Lamprey

In addition to their BLM-sensitive status, Pacific lamprey are also listed by the IDFG as a State **endangered** species, and are considered a federal **Species of Concern**. Adults enter freshwater (Columbia River) between July and September and migrate over 400 miles to Idaho (BLM 2011). Lolo Creek is part of the NPT's "Adult Lamprey Translocation Initiative". As part of this initiative, adults collected at John Day and The Dalles dams from 2006-2009 were released into target streams in the Clearwater Basin, including Lolo Creek. Adults were released at RM 31.4 and 34.4 of Lolo Creek. Subsequent adult movements from the release site were primarily in the downstream direction and averaged 2.0 miles in 2007, 1.1 miles in 2008, and 2.1 miles in 2009. Lamprey redds were observed in Lolo Creek following adult releases (Greig and Hall 2011; NPT et al. 2011). In 2009, follow-up larval sampling in Lolo Creek documented larvae within an 8.6 mile segment of Lolo Creek (from the upper release to mouth of Eldorado Creek [~RM 25.7 of Lolo Creek]). The larval lamprey observed in Lolo Creek were likely the offspring of the adults transferred to Lolo Creek as part of this initiative (NPT et al. 2011). Future objectives of the "Adult Lamprey Translocation Initiative" include continued adult translocations, larval lamprey surveys and monitoring, juvenile outmigration studies, and monitoring of adults voluntarily entering Lolo Creek.

Suitable pockets of sandy/silty substrate for spawning and rearing occur within the mainstem of Lolo Creek. Nez Perce Tribe monitoring has documented both juvenile and young adult lampreys in Lolo Creek (USDOE 1997 as cited in USFS 2009). However, spawning and juvenile rearing does not likely occur in the project area due to the cobble and boulder nature of the substrate. Since 2002, when the Lower Lolo Weir was first put to use, NPT weir operators have not observed any adult lamprey in the project area. No adults have entered the Lower Lolo Weir trap during operations from mid-May through September of 2002 to the present. However, approximately 20 juvenile lamprey were captured in the NPT juvenile screw trap in 2006, during their emigration from the creek (Sprague 2012a).

Redband Trout

Redband trout, a form of resident rainbow trout, are reportedly present in the Lolo Creek drainage (Johnson 2012). In the Clearwater Basin, resident rainbow/redband trout rear in accessible headwater sections of tributaries, and mainstem habitats provide spawning, migration and overwintering habitat (USFS 1999 as cited in Ecovista et al. 2003). Non-anadromous rainbow (redband) trout in the Upper Columbia River basin have been divided into two groups, one group that evolved in **sympatry** with

steelhead and the other **allopatric**, or those that evolved outside the historical range of steelhead. Sympatric rainbow trout are considered the non-anadromous form historically derived or associated with steelhead and have been termed "residuals". Both anadromous and non-anadromous forms exist in sympatry in most populations, and morphologically juveniles of both forms are indistinguishable (Johnson 2012).

Other Anadromous Fish Species

Fall Chinook

Fall Chinook do not occur in Lolo Creek. No historical records or recent documentation of fall Chinook salmon spawning or rearing within the Lolo Creek watershed are available (BLM 2000). ESA-listed fall Chinook salmon (Snake River ESU) spawn and rear in the mainstem Clearwater River. Fall Chinook critical habitat includes the mainstem Clearwater River to the mouth of Lolo Creek, but not Lolo Creek itself. Because fall Chinook do not occur in the Lolo Creek drainage and no direct or indirect effects are expected to occur to the species or occupied habitats in the Clearwater River, they will not be discussed further in this document.

Other Aquatic Species

Mussels

Filter-feeding mussels are known to occur in Lolo Creek, primarily in Musselshell Creek, a tributary that enters Lolo Creek between river miles 26 and 27 (USFS 2009). Small groups of mussels have been found in sandy substrate of the drainage, often in the bottom of pools or sandy areas mixed with small gravels generally near the margins of the stream (USFS 2009).

Other Aquatic Invertebrates

Aquatic invertebrates provide a major prey resource for juvenile salmon and trout, and other fish in Lolo Creek. The most important aquatic insect groups for fish include true flies, mayflies, caddisflies, and stoneflies (USFS 2009). Aquatic invertebrates are also affected by impairments to water quality. The Idaho Department of Environmental Quality determined that the aquatic invertebrate community near Musselshell Creek was not impaired, and Lolo Creek likely exhibits similar conditions though high instream temperatures and low flow likely limit distribution in summer (IDEQ 1996).

3.3.2 Environmental Effects

Direct effects to aquatic resources would occur during instream construction due to the use of equipment and presence of cofferdams and bypass structures. Direct effects would also occur as a result of weir operations and would include handling of aquatic species at the weir and migratory delay. These effects would be short-term in nature. Long-term direct effects associated with the presence of the weir (both in the pickets up and down position) would include a permanent loss of substrate in the footprint of the Proposed Action, and localized modifications in velocity and channel depths associated with minor **backwatering** upstream of the weir sill.

Weir operations could result in indirect effects that persist over the life of the facility. Because the weir would persist in the creek and operate annually from as early as January through September, the majority of anticipated effects to aquatic habitat and species are directly associated with the presence of infrastructure and weir operations. Indirect effects are therefore limited; however, hydraulic modifications could change the type and quantity of fish rearing habitat along stream margins, and potentially alter and increase species composition of prey items (i.e., aquatic invertebrates) along stream margins upstream of the facility.

3.3.2.1 Proposed Action

Aquatic Habitat

Construction Effects

Aquatic habitat would be directly affected during construction activities; effects would be short-term in duration and typically ***low-to-moderate*** in severity. Within the instream construction footprint, aquatic habitat behind cofferdams would be temporarily isolated from the active channel for the duration of instream work (August 1 – October 31). Instream construction could temporarily increase sedimentation and turbidity in the project area, which could alter substrate composition immediately downstream of construction. However, design features, including construction of instream facilities "in the dry" behind cofferdams would mitigate the effects to aquatic habitat. Due to the cobble/boulder nature of the substrate and the low-flow timing of instream work, sedimentation due to installation and removal of cofferdam materials is expected to be ***low***. Any accumulated sediment would likely be flushed downstream of the project area following the first high flow event after construction.

Large rocks provide for channel stability and maintenance of **pocket pools**. Placement of instream structures and removal of boulders has the ability to alter instream hydraulics and flow morphology, and to reduce available rearing habitat for juvenile fish. The large boulders proposed for removal from the weir footprint could provide cover and refuge for juvenile fish, including steelhead and Chinook salmon. As such, boulder removal could result in the long-term loss of pockets of suitable rearing habitat. With the exception of small pocket pools associated with these instream boulders, there are no other pools in the instream construction footprint, and no other habitat refugia would be lost as there are no logs, instream vegetation, back-eddies or overhanging banks present.

The Proposed Action would have very localized ***low effects*** on instream shading and large wood debris recruitment. The three mature cedars (conifers of 28 to 32 inches in diameter) that would likely be removed to install south bank weir abutments are located about 10 feet from the stream edge, and although they provide some shading to the water, there are numerous cedars occupying the hillside within 100 feet of the OHWM that provide shade. As such, the loss of the three trees is not anticipated to result in a measurable increase in instream temperature, or a substantial loss of LWD recruitment from the project area. The removed conifers would be retained for future use in habitat enhancement activities undertaken by the NPT throughout the Lolo Creek watershed. Several cedars and willow bundles would be planted downstream of the proposed weir along the north bank. These plantings, which are included in the design of the project, are intended to mitigate for the removal of the south bank conifers and the minor loss of instream shading associated with removal.

Large woody debris is absent from the creek in the project area, with the exception of one large log that is cabled to the south bank immediately downstream of the bridge. This log would not be disturbed during construction. For these reasons, construction of the Proposed Action would result in ***no effect*** to instream large woody debris. Similarly, the small intermittent side channel that enters Lolo Creek downstream of the proposed weir location would not be affected by construction activities.

The Proposed Action would have very localized and negligible effect (***low effect***) on bank stability; the cedar trees that would be removed are rooted in a bedrock-dominated hillside and don't contribute to soil stability and, following construction, displaced substrates would be returned to pre-disturbance condition (slope, composition, etc.) and disturbed banks would be reseeded or planted with native woody species, including willow and cedar.

Operational Effects

Loss of Habitat in Facility Footprint

The presence of weir infrastructure would directly, and over the long-term, alter approximately 2,651 square feet of instream habitat along an average linear distance of approximately 20 feet. This is a small amount of available habitat along the 42 linear miles of Lolo Creek and thus, impacts from habitat loss

would be ***low*** from the Proposed Action. The majority of direct effects would occur along the north bank, which is currently degraded due to the loss of riparian vegetation associated with previous development of the seasonal weir facility. As discussed above, only approximately 5 percent of the project area is estimated to contain salmonid spawning habitat because the majority of substrate consists of very large cobbles, boulders and bedrock (Section 3.3.1). NPT weir operators have not observed salmonid spawning in the project area. In the event that salmonids spawn on substrate to be occupied by the concrete weir sill, the loss of instream substrate would be approximately 700 square feet. Impacts from the Proposed Action on spawning habitat would be ***low*** because of the extent of underutilized spawning habitat in the Lolo Creek drainage.

Lolo Creek flows rarely drop below 10 cfs; however, such low flows have been documented in the project area during summer months. If flows drop below 10 cfs, all creek flow would be routed down the north bank fishway to provide continued passage upstream. During these periods, the total area of wetted habitat in the immediate vicinity of the weir would decrease until flows increase. However, during such low flow conditions, wetted channel habitat is naturally reduced and elevated instream temperatures likely limit use of the project area by many aquatic species, including salmonids. As such, effects to low flow fish passage under the Proposed Action would likely be ***low***.

Backwatering Upstream of Weir

Operation of the weir and associated fish trapping facility would result in a minor increase in surface water elevation (backwater) upstream of the weir, which could increase sediment deposition in the upstream reach. The extent of deposition is defined by the existing Lolo Creek Road/Woodland Bridge, which serves as the streambed elevation control point for this reach. The bridge abutments also constrict the creek channel. Due to the presence of the bridge, sedimentation is anticipated to be limited to the 150 feet reach of the creek from the proposed weir sill to the bridge. In this reach, some bed **aggradation** (substrate deposition resulting in increased surface elevation) is anticipated. The amount is anticipated to be 1.5 feet or less, or an elevation that would match that of the concrete weir sill.

During weir operation, sediment could accumulate behind the weir and along the streambanks; however, the weir would be lowered during high flushing flows (e.g., spring runoff), as well as following trapping operations. Lowering would allow sediment to be naturally transported downstream and would result in ***low-to-moderate*** levels of sedimentation. The impacts from these levels on water quality are likely ***low-to-moderate*** because the creek is naturally turbid during spring runoff periods. During months when the weir would not operate, flows are relatively low and sediment transport would also be low.

The reach immediately upstream of the weir would likely experience decreased velocities during higher flow periods when the weir is raised. The volume of water upstream of the weir (including the intermittent side channel on the south bank) would increase slightly during high flows due to slight channel constriction and backwatering. The impacts from these changes on velocity are likely ***low*** considering that minor changes in velocity are unlikely to affect fish behavior. Downstream of the weir, operations could result in decreased pool depth and wetted width. However, the project reach is dominated by run habitat and the only major pool downstream of the weir is located approximately 200 feet downstream at a bedrock outcropping on the north bank. The impacts from these changes on the quantity and quality of pools in the project area are therefore considered ***low*** since pools are relatively infrequent in this reach and minor changes in pool character are unlikely to affect use by a substantial number of juvenile salmonid species.

During high flow events, portions of the north bank upstream of the weir could become inundated. This could indirectly benefit rearing juveniles upstream of the weir due to the presence of increased low velocity refuge and foraging habitat. The anticipated area of effect due to upstream backwatering is approximately 640 feet during typical flows (HDR 2011a). Hydraulic analyses suggest that the proposed weir facility would result in a ***low effect*** on water surface elevations during both the 0 percent (weir down) and 100 percent (weir raised) operations (HDR 2011a). Velocities would experience a minor increase locally at the weir structure but would otherwise decrease. These minor velocity alterations over

short distances are anticipated to result in ***low-to-no effect*** on adult or juvenile fish movements and use in the vicinity of the structure.

LWD Passage

The weir would be lowered to pass debris, including logs, every 24 hours during spring runoff periods. For this reason, weir operations should result in ***no effect*** to LWD recruitment to downstream habitats.

Aquatic Species

Construction Effects

Instream Work Area Isolation- Loss of Habitat and Potential Injury or Mortality

Dewatering the instream construction area to isolate the creek from construction activities would result in direct, short-term, ***moderate*** effects to aquatic species that are present in the construction footprint. The area to be dewatered would be approximately 3,929 square feet in size, and this portion of the creek would be temporarily isolated from the creek during the instream work window. Dewatering would require fish salvage to ensure that no fish are stranded in the isolation area. Fish salvage would be conducted by experienced NPT fish biologists as described in Sections 2.1.1.2 and 2.1.3. This would mitigate the effects from the Proposed Action to aquatic species by minimizing the potential for injury or mortality during dewatering.

Due to the low flow conditions on site and elevated instream temperatures during August (see Section 3.3.1), when the majority of fish salvage would occur, it is unlikely that any special status species, including ESA-listed bull trout or steelhead, would be present in the vicinity of instream isolation activities. As such, project timing of the Proposed Action, an environmental design feature, would mitigate effects to aquatic species during construction. Further, given the timing of instream work (August – October), there should be ***no effect*** to salmonid redds, eggs or **fry** due to proposed instream work. Some steelhead juveniles could potentially be present during the second, smaller, instream isolation phase that would occur following construction of the channel-spanning weir and south bank abutments. Those few individuals could be subject to handling during salvage by NPT biologists. Fish salvage protocols described in Section 2.1.3 would minimize the potential for injury and mortality.

Migratory Delay at Work Area

The presence of cofferdams would directly alter stream flows and reduce the width of the available migratory corridor for the duration of instream construction. Individual behavioral modifications due to altered flows would be ***moderate*** and short term in nature.

Low flows and high stream temperatures during the beginning to middle of the instream work window (August and September) limit the presence of sensitive fish species in the project area, though adult lamprey may migrate upstream during this period. If fish are present, they could experience migratory delay due to the presence of the seasonal weir that would be placed downstream of the work area to enable the on-going collection of spring Chinook for NPTH broodstock. The seasonal weir would remain in place for the typical spring Chinook collection period through the end of September and fish that encounter the weir would be manually taken upstream to bypass the construction area. Downstream migrants, possibly including a fall pulse of juvenile steelhead smolts, could experience minor delays during the first phase of instream work as they would be required to move downstream through culverts on the north bank. Although the cofferdam would direct flow into the culverts, it could take more time to migrate through the bypass due to disorientation. However, considering the limited length of the culvert bypass (75 to 90 feet) and that many salmonid smolts migrate at night (darkened conditions in culvert would simulate nighttime), this delay is expected to result in ***low effects*** to fish migration.

Sedimentation and Turbidity

Due to the cobble/boulder nature of the substrate in the project area, the sediment plume from construction would have low impacts on water quality because it would extend less than 100 feet

downstream from cofferdams for up to an hour after cofferdam installation and removal. The sediment plume would likely result in ***low effects*** to aquatic species because these species could use other available habitat and avoid the plume. Sediment abatement measures described in Section 2.1.3 would likely reduce the impact of sediment and turbidity on aquatic species.

Due to the cobble nature of substrates, the relative lack of fine sediments, and the implementation of sediment control measures during construction, turbidity levels would likely not exceed state standards at the downstream end of the project area. The current Idaho water quality standard to protect cold water aquatic life requires that turbidity below any applicable mixing zone should not exceed background turbidity by more than 50 Nephelometric Turbidity Units (NTU) instantaneously, or more than twenty-five (25) NTU for more than ten (10) consecutive days (IDAPA 2011).

NMFS stated as part of the ESA Section 7 consultation for BPA's Habitat Improvement Program in the Columbia River Basin, "salmon and steelhead are generally able to avoid the adverse conditions created by (instream) construction if those conditions are limited to areas that are small or local compared to the total habitat area, and if the system can recover before the next disturbance. This means juvenile and adult salmon and steelhead will, to the maximum extent possible, readily move out of a construction area to obtain a more favorable position within their range of tolerance along a complex gradient of temperature, turbidity, flow, noise, contaminants, and other environmental features. The degree and effectiveness of the avoidance response varies with life stage, season and the frequency and duration of exposure to the unfavorable condition, and the ability of the individual to balance other behavioral needs for feeding, growth, migration, and territory" (NMFS 2003b). NMFS also concluded that, with due diligence and implementation of a full range of mitigation measures, "the threat is negligible that the environmental changes caused by events at any single construction site associated with a proposed activity, or even any likely combination of such construction sites in proximity, could cause chronic or unavoidable exposure over a large habitat area sufficient to cause more than transitory direct affects to individual salmon or steelhead…small to intermediate reductions in juvenile population density in action areas caused by individuals moving out of the construction area to avoid short-term physical and chemical effects of the proposed construction are expected to be transitory and are not expected alter juvenile survival rates" (NMFS 2003b). Thus, the impact from the Proposed Action on sedimentation and turbidity are anticipated to be ***low*** because salmon and steelhead should be able to avoid the instream construction area and the use of mitigation measures would minimize sedimentation and turbidity to the extent possible.

Petroleum and Concrete

Petroleum products and wet concrete are two items that have potential to negatively affect aquatic species, if present in the immediate vicinity and downstream of the project area. Sources of fuel and oil spills or leakage into the stream channel include heavy equipment, portable water pumps, or from products stored on site throughout the duration of the project. Specific design measures for construction and operation have been established regarding fuel storage, fueling of equipment and spill containment (Section 2.1.3). These measures should reduce or eliminate the potential for spill events, and thereby reduce or eliminate any direct effects to aquatic species. Thus, the impact from petroleum products associated with the Proposed Action will likely be ***low*** .

Wet concrete, if placed directly in contact with live stream water can increase pH and release carbonate, both of which are toxic to fish under certain conditions. However, this risk is ***low*** as all concrete would be properly cured prior to removal of cofferdams and exposure to creek water.

Noise Due to Instream Boulder Removal

All instream boulder removal activities requiring rock fracturing would take place behind dewatered cofferdams. The noise produced during micro-blasting in the dry would not translate to underwater sound pressure levels that approach the threshold for injury of juvenile (183 decibels) or adult fish (187 decibels) because boulder removal would occur "in the dry" behind isolation cofferdams, not within the active flow of the channel. For this reason, no underwater activities would occur associated with boulder

removal. Further, because blasting would be one of the first instream actions to take place following dewatering in August, it is unlikely that sensitive cold water fish species would be present in the project area due to high instream temperatures. For these reasons, noise associated with boulder removal should result in ***low-to-no effect*** to aquatic species.

Operational Effects

Potential Mortality or Injury at Weir

The proposed weir design features would help mitigate effects to aquatic species. The risk of fish impingement in the pickets of the proposed weir would be substantially lower than in the existing seasonal weir, because the proposed in-stream picket material is more rigid and has less lateral movement. In addition, the proposed picket angle and surface height would impede jumping of the weir, which can injure fish. Jumping would also be minimized because the proposed fishway would provide water flow that fish typically seek out during upstream migrations. Additionally, the sheltered trap box would reduce adult fish stress by increasing holding volume and shade cover as well as minimizing fish startling. Operationally, mortality would be minimized by the daily removal of all trapped fish with frequent monitoring of the holding population and the instream barrier. Adaptive management measures to reduce the potential for mortality or injury at the weir could include the padding of persistent jumping locations, lining of impact walls, trap inflow alteration to up-well from subsurface, and elimination of any deviant attraction flows entering the holding area. These measures would minimize the potential for fish injury and mortality at the facility. As such, the potential for direct injury or mortality at the new weir is considered ***low***.

Migratory Delay and Handling during Weir Operations

<u>Adults</u>

The timing of proposed weir operations (from as early as January through September) would overlap with the typical adult migration period of steelhead, lamprey and Chinook salmon, as well as the steelhead kelt emigration period. Resident fish, including bull trout, westslope cutthroat trout and redband trout could also be present during weir operations. During operations, the weir would be raised, blocking all passage except for juvenile salmonid smolts and other small fish, which would be able to pass through the one-inch spacings on the weir (see next section for discussion of juvenile passage at weir). Adults would be directed to a new trapping structure, located on the north bank. Sufficient attraction flow would be provided through the fishway, which would be designed to accommodate lamprey passage, and would meet NMFS passage guidelines for juvenile and adult salmon (NMFS 2011).

Fish collection at the new trapping facility would result in direct, ***moderate*** effects, including migratory delays and handling in the trap. Handling could result in stress to individuals. The operational period for trapping would increase compared to the current trapping season, and therefore the duration of exposure to handling stress would also increase for fish species migrating through the project area.

During operations, the trap would be visually inspected once or twice daily, or as specified during the ESA Section 7 consultation for this project, or in ESA Section 10 permits held for steelhead and bull trout by the NPT. Following data collection, non-target fish would be returned to the creek within 24 hours of trapping. Non-target species would be returned to Lolo Creek upstream of the weir using a flexible return pipe. The pipe would be large enough to transport an adult salmonid typically encountered in Lolo Creek, and would discharge into an area of the creek that has sufficient depth to allow for the continuation of upstream migration.

Downstream steelhead kelt or bull trout passage would be accommodated by temporary lowering of the weir, or manual netting and transfer downstream. Kelt passage via weir lowering is an improvement over existing conditions as kelts, on the rare occasions they are encountered, currently are only manually transferred downstream of the seasonal weir. The weir lowering process is anticipated to take approximately 30-40 seconds. If fish are observed backing up behind the weir, the weir would be lowered. As such, operational effects to downstream migrating steelhead or bull trout would be ***low***. If at

any time creek flows are low enough to result in surface water elevations below that of the concrete sill, downstream passage would be provided through temporary lifting of the gate/flashboards of the low flow passage notch. Operational effects to low flow fish passage would therefore be ***low***.

Juvenile Salmonid Smolts/Other Small Fish

Juvenile steelhead and Chinook smolts outmigrate from Lolo Creek in the spring (March through mid-June), and a smaller pulse of juvenile steelhead outmigrate in the fall (September through November). During the spring smolt emigration period, Lolo Creek flows are high enough to top the concrete sill and allow passage through the one-inch spacings of the weir pickets.

During the smaller outmigration of juvenile steelhead in fall, flows are typically high enough to top the sill to allow for passage through the pickets. However, during extreme low flow periods in September, the surface water elevation may not be sufficient to overtop the sill to allow passage through the pickets. During these times, the creek would flow through the fishway which would contain a picket gate sized with one-inch openings that would allow juveniles to pass. The one-inch picket spacing should also accommodate passage of adult lamprey since bar spacing of 1.9 cm (3/4 inch) is needed to exclude most adult Pacific lamprey in the Columbia River drainage (Moser et al. 2007). In addition, the proposed fish ladder would accommodate adult lamprey passage, as described in Section 2.1.1.2.

Considering these environmental design features, effects to passage by juvenile or small fish are anticipated to be ***low***.

Migration during Non-Operational Periods

During non-trapping periods (October through January, or later depending on creek icing), the picket barrier would be positioned to have a slight down-slope, allowing unimpeded upstream and downstream passage. Because the sill and attached weir would lie approximately 8 inches higher than the existing creek bed, a low flow passage mechanism would accommodate passage during extreme low flow periods (10 cfs or less) when the surface water elevation upstream of the weir would be lower than that of the sill. The north bank portion of the sill would be notched to an elevation equal to the upstream substrate elevation, allowing water to concentrate into a four foot opening to allow passage. Because fish would pass through this opening primarily during extreme low flow periods, flow through the north bank opening would be of sufficient velocity to allow passage for all life stages. The adult life stages of several sensitive salmonid species, including ESA-listed steelhead adults and BLM sensitive spring Chinook, are typically not present from October through December. As such, they would not likely utilize the low flow passage notch. The low flow passage notch would therefore mitigate for effects to passage during low flow, non-operational periods and the effects on migration during non-operational periods is expected to be ***low***.

Effects to Specific Species

ESA-Listed Fish

If ESA-listed steelhead and bull trout are present in the project area during weir operations, they would be subject to direct, long-term, ***moderate*** effects including migratory delay and stress during trapping and handling. Following construction, 2,651 square feet of instream habitat would be lost in the project area, primarily along the north bank. However, the north bank is currently degraded and functional riparian vegetation is lacking. The NPT currently holds permits to allow for handling of bull trout and steelhead associated with weir operations in Lolo Creek. A biological assessment (BA) has been prepared for the Proposed Action and the BLM has requested formal consultation for effects to species under the jurisdictional authority of NMFS and USFWS, as well as designated critical habitats pursuant to Section 7 of the ESA (BLM and HDR 2012).

The Proposed Action would likely have a beneficial effect on ESA-listed fish because the information collected on use, abundance, and run timing of Lolo Creek steelhead would be used to inform managers about the status of the Lolo Creek steelhead population.

BLM-Sensitive Fish

Under the Proposed Action, direct, long-term, ***moderate*** effects to BLM-sensitive spring Chinook salmon, redband trout, westslope cutthroat trout, and Pacific lamprey would include increased exposure to handling and migratory delay associated with the extended period of trapping operations compared to baseline conditions. Impacts on these species would likely be limited because the instream work would occur during the low flow summer period when the majority of these species are not present in the project area due to prohibitively high instream temperatures.

The potential for effects to spawning and rearing Pacific lamprey is considered ***low*** since juveniles prefer sandy/silty/muddy habitats that are not present in the project area. However, migrating adults and juveniles would encounter the weir because their summer migratory timing overlaps with current weir operations at the seasonal facility. The number of lamprey that migrate past the project area to/from spawning and rearing habitats (upstream of the project area) may increase as a result of on-going adult releases into Lolo Creek associated with NPT's Adult Lamprey Translocation Initiative. As such, under the Proposed Action, an increased number of migrating adults could be delayed at the proposed facility. Although both adult and juvenile lamprey can likely pass through the one-inch picket spacings on the weir, the fishway would also be designed to accommodate adult lamprey passage (see Section 2.1.1.2).

Although BLM-sensitive fish species would experience migratory delays at the weir, the effect to these species is considered ***moderate*** because delays would be temporary, and fish could continue their upstream migrations following temporary holding at the facility.

Mussels

The potential for direct effects to mussels is low and would be short-term, during instream construction activities. Mussels prefer sandy substrates that are not present in the footprint of instream work. Operations could result in increased sedimentation and potential smothering of mussels. However, because sandy substrate upstream and immediately downstream of the weir is limited, the potential for this effect is also considered ***low***.

Other Aquatic Invertebrates

Other aquatic invertebrates present in the construction footprint would be displaced or suffer mortality during construction activities and associated dewatering. Although some individuals would be lost during dewatering activities, instream work would occur during periods of low flow, when it is likely that densities would be low as individuals move to wetted habitats. The direct loss of invertebrates would result in a short-term small depletion in the available food source for fish species in the vicinity of instream activities; however, the effects from this loss is considered ***low*** because of the relatively small footprint of instream work in comparison to available aquatic habitats in the Lolo Creek drainage/analysis area. Aquatic invertebrates in Lolo Creek are expected to fully recover to previous levels after instream construction concludes, though weir infrastructure would replace a small amount of available substrate with concrete for the life of the project. For these reasons, effects to other aquatic invertebrates due to implementation of the Proposed Action are considered to be ***low***.

3.3.2.2 No Action Alternative

Aquatic Habitat

Under the No Action Alternative, on-going operational effects due to existing seasonal weir operations would continue. This includes seasonal restriction of flow to the north bank due to the presence of infrastructure, loss of a minor amount of substrate habitat, minor backwatering, and turbidity associated with seasonal weir removal and installation. In summary, ***low*** direct effects to aquatic habitat would continue to occur under the No Action Alternative.

Aquatic Species

Under the No Action Alternative, fish species that migrate through the project area would continue to encounter direct migratory delays during the existing seasonal weir operational period (mid-May through September). Further, aquatic species would not be subject to temporary water quality degradation during instream construction activities. There would be no facilities to monitor use, abundance, and run timing of Snake River B-run steelhead (in Lolo Creek), as required by NMFS in the FCRPS Biological Opinion (NMFS 2008) and supplement (NMFS 2010). Additionally, spring Chinook broodstock for the NPTH would not represent the full genetic spectrum of populations in Lolo Creek due to the inability to install the seasonal weir during high flow periods at the beginning of the run.

3.4 Water Resources

The analysis area for water resources includes the segment of Lolo Creek 640 feet upstream and 1000 feet downstream of the new weir (see Figure 2-3). This analysis area is based on the potential for minor hydraulic effects to water resources during weir operation. Issues addressed in this section include temporary and permanent effects of the alternatives on water quality and quantity and **hydraulics** and **hydrology** within the water resources analysis area.

This section summarizes information provided in the technical analyses prepared for the Proposed Action, including a hydraulic analysis (HDR 2011a), BA (BLM and HDR 2012) and Wild and Scenic River Section 7 Analysis (Appendix B). These documents provide additional detail about water resources in the vicinity of the project, methodology used in the analyses, and potential effects of the Proposed Action on water resources.

3.4.1 Affected Environment

In general, the overall condition of water quality and quantity in the Lolo Creek analysis area is good. As described in Section 3.3, no known water quality impairments exist in the analysis area, other than elevated temperatures during the low-flow summer months. Table 3-1 and Table 3-2 in Section 3.3 (Aquatic Habitat and Special Status Species) provide stream flow and temperature data for the analysis area.

As described in Appendix B, much of Lolo Creek exists in its natural state, free-flowing with no impoundments and largely undeveloped shorelines. The Wild and Scenic River Section 7 Analysis (Appendix B) and Section 3.8 (Recreation) describe the ORVs associated with Lolo Creek, including scenic and recreation values. These ORVs are related in part to the free-flowing nature of Lolo Creek, as well as the natural state of the creek's shorelines and water quantity and quality conditions.

3.4.2 Environmental Effects

3.4.2.1 Proposed Action

The Proposed Action would have direct, temporary and permanent effects on water resources (Lolo Creek) within the analysis area. These effects are described in detail below; additional detail is provided in the Wild and Scenic River Section 7 Analysis (Appendix B) and the Wetland and Stream Delineation Report (Appendix C). Indirect effects on water resources are anticipated to be limited, and would result from the temporary loss of streamside vegetation along the north bank, which could accelerate bank erosion until plants mature over a few seasons. The effects on water resources are limited to the immediate vicinity and scope of the Proposed Action.

Water Quality and Quantity

Construction Effects

Construction of the instream elements of the Proposed Action would have direct, short-term, ***low*** effects on water quality and quantity. Section 3.3 describes these effects, which include increased turbidity and

sedimentation in the analysis area; potential for fuel, oil, or concrete spills; and interruption and/or alteration of stream flow in the area dewatered to isolate the creek during instream construction. These effects would be limited to the construction period and would therefore be short-term in nature and are considered ***low***.

Operational Effects

During operation of facilities associated with the Proposed Action, sediment would accumulate behind the weir until the streambed elevation upstream is equal to that of the weir sill. If sediment blocks the spacings of the weir pickets during the spring runoff period when stream flows are high, the weir would be lowered to pass materials. Periodic lowering of the weir would introduce a temporary pulse of sediment as accumulated debris and materials pass downstream (see Section 2.1.1.3 and Appendix B). This sediment would likely dissipate within a few minutes of weir lowering. High turbidity is an existing condition during high flow periods in Lolo Creek and lowering the weir would result in a low, temporary increase in instream turbidity when compared to normal background levels during high flow events.

Facility maintenance activities would include occasional in-stream work, which would be conducted during the typical instream work window for Lolo Creek (August), or during low-flow months when instream temperatures are high (late July through September, as approved by NMFS and USFWS). These activities could temporarily increase turbidity and sedimentation in the analysis area, though conducting work during low flow periods would limit the potential for such effects, which would be infrequent and short-term in nature. Maintenance activities would be performed from the top of the bank to the extent possible; however, the use of instream mechanical equipment could be required, depending on the nature of maintenance actions. Hydraulically operated equipment that could work below the OHWM would be retrofitted with vegetable-based fluid in the hydraulic system. These measures would mitigate for the operational effects to water quality during maintenance actions and the effects would be considered ***low***.

Operation of the Proposed Action is not anticipated to have any long-term effects on the timing or quantity of stream flow in Lolo Creek. Thus, the Proposed Action would have ***no-to-low*** effects on water quality and quantity.

Hydraulics and Hydrology

Construction Effects

Construction of the Proposed Action would have direct, short-term, ***low*** effects on the hydraulics and hydrology of Lolo Creek during the instream construction period. The isolation of the dewatered area would alter the location and form of the creek temporarily, shifting water away from the work area. These effects would be limited to the construction period and would be short-term in nature.

Operational Effects

The Proposed Action would have direct, long-term, ***low*** effects on the hydraulics and hydrology of Lolo Creek within the analysis area. These effects are summarized below and described in detail in Appendix B.

The Proposed Action would be designed to maintain the free-flowing nature of Lolo Creek. The new weir would be designed to allow surface water to flow through the structure during operation (see Section 2.1). The existing Lower Lolo Weir was considered in the Wild and Scenic suitability analysis for Lolo Creek (BLM 2005, 2006). The suitability analysis determined “during operation, the weir does not affect the amount of water passing downstream but constricts flow to allow operation of the trap.” The free-flowing condition of the river would thus not be altered by the Proposed Action, though the new weir would operate over an extended period compared to the existing seasonal facility.

The creek is confined along the south bank by the bedrock; a floodplain on the north bank is inundated relatively frequently (every 2 to 10 years) under existing conditions (HDR 2011a). Flow over the weir would not be artificially confined or directed in a matter that would cause bank erosion. Minor backwatering during high flow periods when the weir is in operation could slightly increase the frequency

of flooding along the north bank in areas where flooding typically occurs. This condition could result in minor bank erosion upstream of the weir within the analysis area; however, this is not likely to undermine bank stability upstream because existing bank conditions are relatively stable (Appendix B). The weir would not substantially alter the ability of the stream to meander (HDR 2011a). During low flow conditions, and similar to current seasonal weir operations, flow would be constricted along the north bank to operate the trap and fish ladder.

Some measurable changes to the streambed elevation would occur due to the accumulation of sediment immediately upstream of the weir sill. Maximum sediment accumulation depths would be approximately 1.5 feet, extending for approximately 165 feet upstream (HDR 2011a). Within a small localized area associated with weir and associated facilities (i.e., north bank) the width depth ratio would be altered (e.g., slightly more confined). Seasonal flows would maintain streambed elevations similar to existing conditions, and sediment transport would continue to occur at a natural state of equilibrium that would fluctuate depending annual flows and thus, the impacts from the Proposed Action on streambed elevation are likely to be ***low***.

Increases in water surface elevations would also occur upstream of the weir, primarily during high flow periods (Appendix B, *Anticipated Effects to Instream Hydraulics* Section, for additional detail). During operational flows (2,000 cfs or less) when the weir is raised, minor increases in surface water elevations and minor decreases in velocity upstream of the weir would be measurable approximately 640 feet upstream of the proposed weir location (HDR 2011a). This effect would also occur when the weir is lowered, but to a lesser degree. The velocity of stream flow would increase slightly downstream of the weir as water flows through the structure. However, these effects are not anticipated to result in measureable hydraulic changes to adjacent floodplains, including frequency or depth of overbank areas and thus, the impacts from the Proposed Action on instream hydraulics is likely to be ***low***.

The Proposed Action would have ***low-to-no*** effect on the function of the floodplain on the north bank of Lolo Creek. Upland structures would be designed and placed to minimize effects to floodplain function. Bank protection would be constructed to minimize bank erosion.

The Proposed Action would result in ***low*** effects on hydrologic processes including minor upstream accumulation of sediment, increases in velocity over and downstream of the weir, and decreases in velocity upstream of the weir (HDR 2011a). Due to the presence of the bridge structure, excess accumulation of sediment upstream of the weir would likely be mobilized and limited accumulated material would remain. A natural equilibrium should develop within the first year of operation such that sediment transport would not be affected. The weir would be lowered during high flow events to allow transport of sediment downstream, which would reduce the effects to hydrologic processes in the project area to ***low***.

No Action Alternative

Under the No Action Alternative, there would be ***no effect*** to water resources from construction. However, ongoing operational effects associated with existing seasonal weir operations would continue, including minor backwatering associated with the weir structure and minor turbidity associated with seasonal weir removal and installation. Impacts to water resources from on-going operations would continue to be ***low***.

3.5 Vegetation and Wetlands

The analysis area for vegetation communities, wetlands, special-status plants, and invasive species includes the 2.4-acre project ROW and 640 feet upstream and downstream from the project ROW for new riparian plantings. Issues addressed in this section include temporary effects during construction in the analysis area, and permanent effects in the analysis area due to long-term operation of the Lolo Creek weir, trapping facility, and public recreation.

3.5.1 Affected Environment

3.5.1.1 Vegetation Communities

Descriptions of the vegetation communities within the project area follow Mancuso (1996), as updated with field observations from June 2011 site investigations (HDR 2011c). Vegetation communities are shown on Figure 3-1.

Thinleaf Alder/Deciduous Shrub Riparian Habitat

Riparian habitat in the analysis area is located in the narrow floodplain of Lolo Creek. Dominant species consist of thinleaf alder, Pacific ninebark (*Physocarpus capitatus*), and red osier dogwood (*Cornus sericea*). Beginning about 75 feet downstream of the Lolo Creek Road/Woodland Bridge, a thin band of immature, thinleaf alder comprises the bulk of the riparian community along the north bank, which is heavily disturbed due to former development of the site for the temporary weir facility and on-going recreational use. During lower flow periods, extensive gravel bars are exposed along the bank and provide habitat for reed canary grass. The south bank downstream of the Lolo Creek Road/Woodland Bridge is mainly comprised of a relatively dense and undisturbed narrow band of thinleaf alder and Pacific ninebark. Thimbleberry, snowberry and reed canary grass occur along the bank landward of the OHWM. This vegetation community continues upstream of the Lolo Creek Road/Woodland Bridge. A north bank point bar about 100 feet upstream of the bridge supports a well-developed riparian community of thinleaf alder and red-osier dogwood, as well as scattered black cottonwood (*Populus trichocarpa*) trees.

Upland Habitats

Conifer stands of Douglas-fir (*Pseudotsuga menziesii*), grand fir (*Abies grandis*), and western red cedar (*Thuja plicata*) occur on the steep upland slopes adjacent to the project area. Scattered ponderosa pine (*Pinus ponderosa)* and larch (*Larix occidentalis*) also occur within these stands. Adjacent to the project area, the south side of Lolo Creek upland conifer stands (north aspect) consists of closed canopy conifer stands of medium sized to mature trees, while the north side consists of a more open conifer canopy cover. The understory is relatively open, and consists mainly of mosses and ferns with scattered shrubs such as false azalea (*Menziesia ferruginea*), thimbleberry (*Rubus parviflorus*), mountain maple (*Acer glabrum*), and serviceberry (*Amelanchier alnifolia*). Bedrock outcrops are present on both banks of Lolo Creek, becoming more prevalent downstream of the project ROW.

Developed/Disturbed Land

Within the cleared and graded terrace area that supports the existing seasonal weir facilities (trailer pad, staff housing, electrical equipment, staff parking), the vegetation is limited to introduced grass and forb species such as English plantain (*Plantago lanceolata*), hairy cat's ear (*Hypochaeris radicata*), reed canary grass, and common mullein (*Verbascum thapsus*). Fill material is present along the north bank from the creek's edge to the **toe of slope** of the steep north hillside.

3.5.1.2 Wetlands

The following wetlands were identified and delineated during a June 2011 site investigation (HDR 2011b; Appendix C), and are shown on Figure 3-1.

Emergent Wetlands

One palustrine, emergent wetland fringes the north bank of Lolo Creek near the downstream end of the project ROW. Because the identified wetland area lies below the OHWM of Lolo Creek, seasonal flooding and interstitial water from Lolo Creek are the primary sources of wetland hydrology for this feature. Reed canary grass is predominant, with scattered bittersweet nightshade (*Solanum dulcamara*) also present.

Scrub-Shrub Wetlands

Two palustrine, scrub-shrub, broad-leaf wetlands are located upslope of the south bank of Lolo Creek, downstream of the Lolo Creek Road/Woodland Bridge. One of the scrub-shrub wetlands is located on the south bank and immediately upslope of the OHWM of Lolo Creek. It is primarily fed by subsurface seeps that discharge into Lolo Creek; there are no indications that Lolo Creek provides substantial hydrologic input to the wetland. The wetland is dominated by thinleaf alder and Pacific ninebark. Dominant emergent species include meadow foxtail (*Alopecurus pratensis*) and field horsetail (*Equisetum arvense*).

The other scrub-shrub wetland is a slope wetland located upslope of a small tributary to Lolo Creek. It is primarily fed by subsurface seeps. It is dominated by Pacific ninebark, field horsetail, lady fern (*Athyrium filix-femina*), and tall bluebells (*Mertensia paniculata*).

3.5.1.3 Special Status Plants

ESA-Listed Plants

Two ESA-listed plant species have been identified by the BLM and USFWS as occurring in Clearwater and Idaho Counties, Idaho: MacFarlane's four-o'clock (*Mirabilis macfarlanei*, Threatened) and Spalding's catchfly (*Silene spaldingii*, Threatened) (BLM and HDR 2012). Whitebark pine (*Pinus albicaulis*) a federal **candidate** tree species also occurs in Idaho and Clearwater Counties.

The analysis area is within the elevational range of both plant species; however, suitable habitat such as grasslands or Palouse/prairies is not present in the immediate project footprint where vegetation clearing would occur. Surveys of the riparian habitats in the vicinity of the existing weir conducted in 2010 by the BLM did not document any occurrence of these species (Johnson 2011). On-site plant surveys conducted by project biologists in June 2011 in conjunction with wetland delineations did not document these species (HDR 2011c). The project and analysis area does not provide habitat suitable for whitebark pine, which is higher elevation alpine areas; and no documented records exist within the immediate analysis area for this species. Further, a data systems search of the area conducted by the Idaho Fish and Wildlife Information System reported no records of either species within two miles of the project location (IDFG 2010a, b; 2011). Because the project/analysis area does not provide suitable habitats for ESA-listed or candidate plant species, there will likely be ***no effect*** on ESA-listed plants from the Proposed Action.

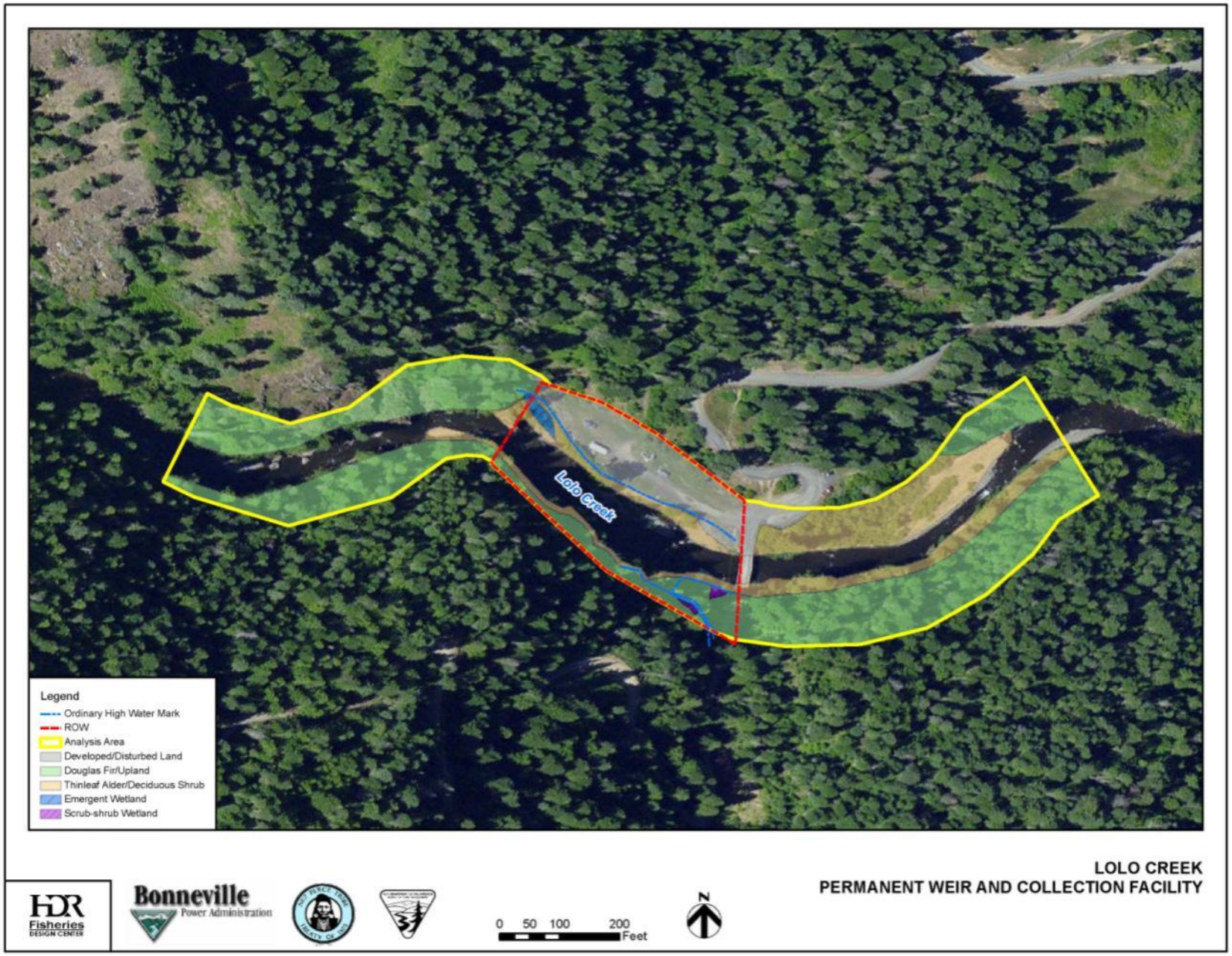

Figure 3-1. Vegetation Communities and Wetlands within the Project Analysis Area.

Idaho State Sensitive Plant Species

IDFG identified four BLM Idaho sensitive plant species that are known to occur or have historically occurred within two miles of the project area, but outside of the analysis area (IDFG 2010a). The species and preferred habitat are listed in Table 3-4. Based on the preferred habitat of these species, they are unlikely to occur in the analysis area. None of the species were observed during plant surveys conducted in June 2011(HDR 2011c).

Table 3-4. Idaho State Sensitive Plant Species.

Common Name	Genus - Species	Habitat
Jessica's aster	*Symphyotrichum jessicae*	Palouse Prairie and canyon grasslands, often near small drainages, but on dry ground (BLM 2009). Generally found within ponderosa pine/snowberry, Idaho fescue/snowberry, and Douglas-fir/ninebark habitat types. Other associated species include bluebunch wheatgrass and arrowleaf balsamroot.
Plumed clover	*Trifolium plumosum ssp. amplifolium*	Dry to moderately moist Palouse Prairie, canyon grasslands, and meadows, within the Idaho fescues and bluebunch wheatgrass habitats in ponderosa pine stands (BLM 2009).
Palouse goldenweed	*Pyrrocoma liatriformis*	Occurs in Palouse Prairie and canyon grasslands, generally within the Idaho fescue and bluebunch wheatgrass habitat types (BLM 2009). Other typical associated species include: prairiesmoke, western yarrow, northwest cinquefoil, and Nootka rose. Occurs from 1,900 to 3,000 feet.
Broad-fruit mariposa	*Calochortus nitidus*	Endemic to the Palouse Prairie and canyon grasslands and associated with canyon rims, ridges and upper slopes (BLM 2009). It also occurs within natural forest openings and open ponderosa pine and/or Douglas-fir communities in forested uplands. The plant is shade-intolerant that occurs on flat to gentle or occasionally steep slopes, on all aspects.

BLM Sensitive Plant Species

BLM-sensitive plant species that potentially could occur within the Lolo Creek Analysis Area, along with preferred habitats for each species are listed in Table 3-5 (Johnson 2011). No individuals of the species listed below were observed in June 2011.

Table 3-5. BLM Sensitive Species (Plants) - Cottonwood Field Office Area.

Common Name	Genus - Species	Habitat
Deer-fern	*Blechnum spicant*	Occurs at lower elevation (less than 4,200 feet) within dense, moist, generally mature western red cedar with western hemlock forests. Most often grows in western red cedar/wild ginger (*Asarum caudatum*), western hemlock/wild ginger, or western hemlock/oak fern (*Gymnocarpium dryopteris*) habitat types. Usually on northern aspects and moderate slopes (10 to 60 percent).

Table 3-5. BLM Sensitive Species (Plants) - Cottonwood Field Office Area.

Common Name	Genus - Species	Habitat
Case's corydalis	*Corydalis caseana ssp. hastata*	Primarily found along streams within the riparian area. Commonly found in cedar, Engelmann spruce and grand fir habitat types.
Chatterbox orchid	*Epipactis gigantea*	Occurs within moist riparian habitats associated with springs, seeps, stream banks, and thermal sites.
Spacious monkey-flower	*Mimulus ampliatus*	Seepy **outcrops** and seeps in open grassland or forest opening. Prefers particularly moist and shady sites. Known locations range from 2,600 to 6,900 feet in elevation.
Stalk-leaved monkey- flower	*Mimulus patulus*	Found on seeps, moist basalt, and very fine gravel on top of bedrock. May be found in relatively undisturbed, winter-wet, summer dry, canyon grasslands.
Thin –sepal monkey-flower	*Mimulus hymenophyllus*	Found in wet, **mesic forests**.
Hall's orthotrichum	*Orthotrichum hallii (moss)*	Found on dry rocks that are shaded.
Goldenback fern	*Pentagramma triangularis ssp. triangularis*	Rock crevices and open rocky slopes in valleys and foothills. Found often in partly shaded sites. From 1,500 to 2,700 feet.
Douglas' clover	*Trifolium douglasii*	Found in meadows, riparian areas, and along streambanks.
Western ladies-tresses	*Spiranthes porrifolia*	Typically occurring in seeps in Douglas fir stands at lower timberline near transition to grasslands.
Idaho barren strawberry	*Waldsteinia idahoensis*	Meadows and moist woods along streams. Toe to mid-slopes, occurs in moist and cools sites associated with grand-fir, cedar, and alpine fir zones.

3.5.1.4 Invasive, Non-Native Species

Non-native plants and **noxious weeds** can alter the integrity of vegetation communities. Idaho state law designates 64 plant species as noxious weeds (ISDA 2012). Spotted knapweed (*Centaurea maculosa*), a designated noxious weed and **containment species** in Idaho, is present along the western-most portion of the ROW parcel, and has been established for nearly 10 years. Additional, weeds listed for control or containment such as Scotch broom (*Cytisus scoparius*) and tansy ragwort (*Senecio jacobaea*), are inventoried as present throughout Idaho and Clearwater Counties and may occur to a limited extent within disturbed land at the existing facilities site on the north side of Lolo Creek and near Lolo Creek Road (ISDA 2012). Tall hawkweed (*Hieracium piloselloides*), which is found in open fields, meadows, forest clearings, pastures and mesic habitats, is the only species on the Statewide Early Detection Rapid Response List mapped as occurring in Idaho or Clearwater counties (ISDA 2012). This species was not observed on site during June 2011 botanical investigations conducted for the project (HDR 2011c).

The analysis area is located at the boundary of the Upper Clearwater and Clearwater Idaho State Department of Agriculture Cooperative Weed Management Areas (CWMA) (ISDA 2012). The goals of the Cooperative Weed Management Areas are to facilitate effective treatment, integrate weed programs, and coordinate efforts along logical geographic boundaries with similar lands, use patterns, and problematic weeds (ISDA 2012). Cooperating partners of the Cooperative Weed Management Areas include private landowners, county government, Nez Perce Biocontrol Center, state agencies, federal land management agencies, and interested organizations and individuals. Weed management practices recommended by the CWMA, and the BLM, would be used to control invasive plants in the project area.

3.5.2 Environmental Effects

This section describes anticipated direct and indirect effects to vegetation communities, wetlands, special-status plants, and invasive species due to construction, operation of facilities, and recreation elements included in the Proposed Action, as well as due to the No Action Alternative. Effects related to construction, and effects to habitat due to operation of the weir would primarily occur in the project area (existing ROW). Effects to species due to new riparian plantings would apply to the analysis area (640 feet upstream and downstream from project ROW).

3.5.2.1 Proposed Action

Vegetation Communities

Construction of the Proposed Action would have direct temporary (short-term) and permanent (long-term) effects on vegetation communities in the ROW within the analysis area. Direct effects would occur through the removal of or disturbance to existing vegetation during grading and construction of new facilities.

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

Along the north bank, the Proposed Action would directly affect about 50 linear feet of streambank occupied by immature native communities of thinleaf alder/deciduous shrub riparian habitat. Numerous native willows would be planted immediately downstream of the proposed north bank fishway structure to mitigate for the loss of the low-quality alder community along the north bank riparian fringe. Permanent and temporary direct effects on vegetation types would also occur due to removal of the introduced grasses and forbs in the area of the existing facilities due to grading and construction on the north bank of Lolo Creek. Because this is low-quality introduced vegetation, impacts would be ***low***.

Along the south bank, up to three mature conifers would be removed due to placement of weir abutments. These trees (28 to 32 inches in diameter) are located about 10 feet from the stream edge and although they provide some shading to the water, there are numerous cedars occupying the hillside within 100 feet of the OHWM that provide shade to the water and habitat for bird species. As such, the loss of the three trees is not anticipated to result in a measurable increase in instream temperature, or a substantial loss of LWD habitat or recruitment from the project area. Understory vegetation along the south bank is limited to mosses and ferns that are not shade-producing. The loss of up to three conifers from the south bank would be mitigated by the planting of several cedars along the north bank, just downstream of the proposed north bank fishway and trapping facility. For these reasons, the loss of three conifers from the south bank would result in ***low effects*** to vegetation resources in the area.

Effects to vegetation due to operation and maintenance under the Proposed Action are anticipated to be ***low***, and limited to increased human activity on disturbed/developed land in the vicinity of the fish collection facility and for periodic maintenance.

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

Because the vegetation in the proposed construction area is already largely disturbed and measures would be taken to reduce the spread of noxious weeds and reduce erosion and sedimentation (Section 2.1.3, Environmental Design Features), the potential indirect effects on vegetation from the Proposed Action would be ***low***.

Wetlands

There would be ***no effect*** (temporary or permanent) to wetlands in the analysis area as a result of construction under the Proposed Action. Operation and maintenance of facilities under the Proposed Action would be limited to areas outside of wetlands, thus ***no direct effects*** from operation and maintenance activities are anticipated.

As with vegetation communities, the Proposed Action could indirectly affect wetlands through the inadvertent spread of non-native plants and noxious weeds from ground-disturbing activities and dispersal from construction equipment and personnel. Erosion and sedimentation from construction activities could also indirectly affect wetland vegetation communities; however, wetlands are located outside of the construction footprint and staging areas and boundaries would be staked with silt fencing prior to construction to ensure avoidance. Measures would be taken to reduce sediment deposition during construction and installation of woody riparian vegetation and reseeding disturbed areas with native species would offset potential increases in populations of non-native plant species (Section 2.1.3, Environmental Design Features).

Operating the weir under the Proposed Action could indirectly affect the hydrology of emergent wetlands on the north bank of Lolo Creek downstream of the weir due to a minor decrease in pool depth and wetted width. Since scrub-shrub wetlands near the south bank of Lolo Creek are located landward of Lolo Creek and on the opposite bank of the collections facility, the operation of the weir is expected to have ***no effect*** on these wetlands.

Seasonal use of the designated kayak put-in area would directly affect an emergent wetland on the north bank of Lolo Creek through an increase in soil compaction due to increased pedestrian traffic. These impacts are considered to be ***low*** due to the small size of the affected area (estimated 10 feet wide corridor for boater access) and the limited number of boaters that are expected to traverse the put-in location (about 15 people per year reportedly run the creek [BLM undated]). Effects to wetland plant species would be ***low*** since the wetland is typically submerged during run-able high flows. The invasive reed canary grass community that dominates the wetland is more advanced for growth and cover after the flows drop. Once flows drop and vegetation emerges along the banks due to receding water levels, boater use and access would likely be infrequent. As such, impacts to emergent vegetation in this wetland would be ***low***.

Special Status Plants

If populations of ESA-listed, BLM sensitive, or rare plant species were present, construction activities could have the potential to affect them through trampling, removal of individuals, habitat degradation, potential spread and colonization of noxious weeds, or degradation of habitat through erosion and sedimentation, or hydrologic changes. However, since there are no known occurrences of rare, threatened, or endangered species in the analysis area, the Proposed Action is likely to have ***no effect*** to special-status plant species.

Invasive Plants

As described above, the Proposed Action could cause the spread of non-native plants and noxious weeds from ground-disturbing activities and dispersal from construction equipment and personnel, increased pedestrian traffic during operation and maintenance of facilities, kayak put-in and haul-out activities, and other recreational activities. Plantings proposed on the north bank would be conducive to providing shade to prohibit the establishment of invasive plant species in the disturbed riparian corridor, and disturbed areas would be reseeded with native species that could reduce the establishment of weeds. During construction, all construction equipment would be washed prior to leaving the site to prevent noxious weed dispersal.

With implemented project design features, the proposal will not result in the introduction of new weed species or spread of the existing invasive plants, such as spotted knapweed. As such, the potential for the Proposed Action to spread invasive species is anticipated to be ***low***.

3.5.2.2 No Action Alternative

Under the No Action Alternative, ongoing operational effects associated with existing installation and removal of the existing seasonal weir would continue, which could include minor effects to vegetation in disturbed and riparian habitats on the north bank of Lolo Creek, and possible spread of non-native plant species. Under current operations, the NPT must control noxious weeds as a stipulation of the existing ROW.

3.6 Terrestrial Wildlife Habitat and Special Status Species

The analysis area for terrestrial wildlife habitat and special status species is a 2-mile radius based on temporary noise during construction, and 640 feet upstream and downstream of the project ROW for project operations (Figure 3-1 and Figure 3-2). Issues addressed in this section include temporary (short-term) effects to terrestrial wildlife and special status species during construction in the 2-mile analysis area, and permanent (long-term) effects to these wildlife resources in the analysis area due to long-term operation of the Lolo Creek weir, trapping facility, and public recreation.

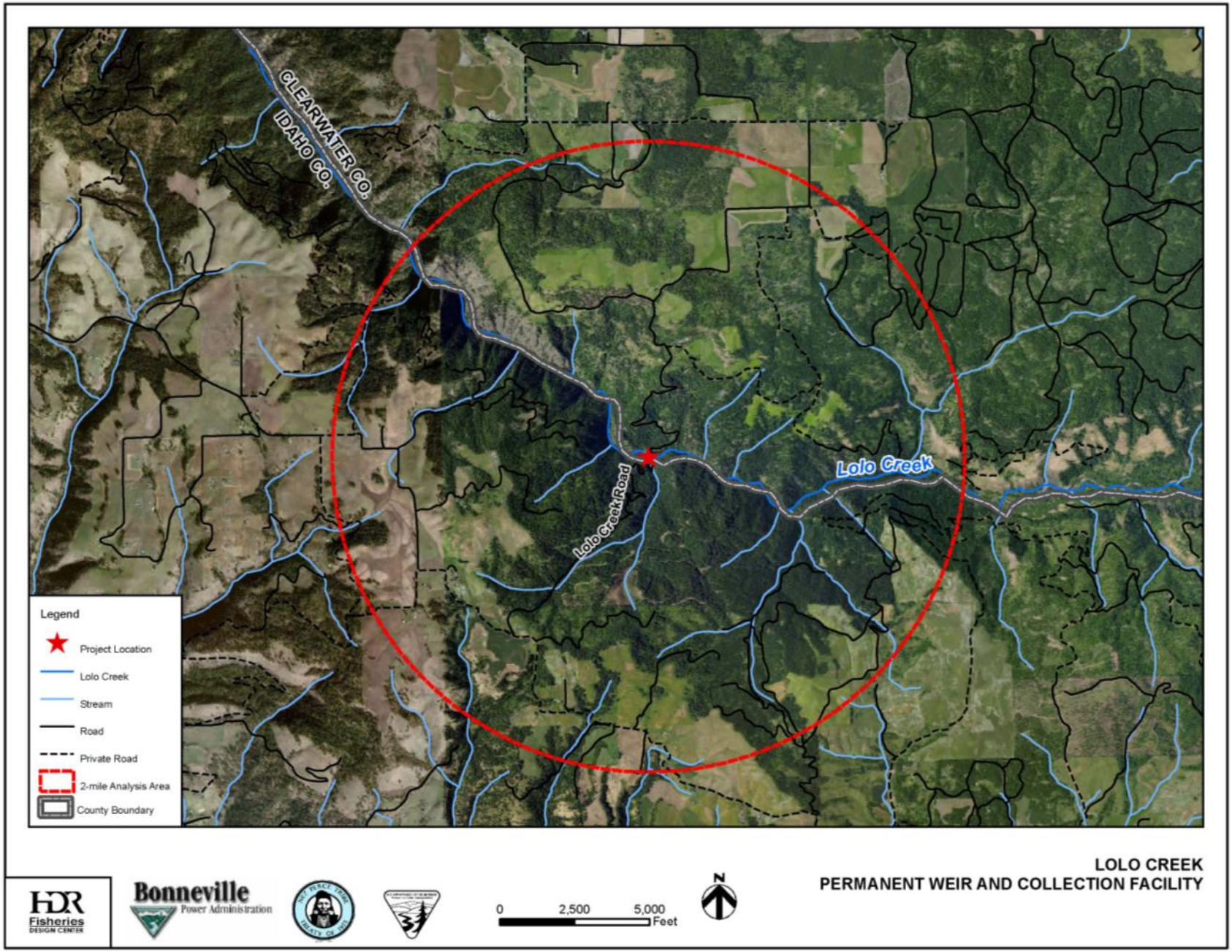

Figure 3-2. Terrestrial Wildlife Habitat and Special Status Species Analysis Area.

3.6.1 Affected Environment

3.6.1.1 Wildlife/Habitat

The analysis area is considered part of the Northern Rockies Ecoregion of the Pacific Northwest (Omernik and Gallant 1986). Cliffs, rock outcrops and **talus fields** are common along the Lolo Creek canyon (BLM 2001). The steep south-facing slopes on the north side of the canyon support mixed conifer stands interspersed with rocky, grassy openings, and sparsely vegetated cliffs and rock outcrops. Herbaceous vegetation dominates the pine understory. Shrubs are uncommon, except in draws, or in association with some other rocky habitats. Near the west end of the analysis area, pine woodlands transition to mixed conifer forest communities. Douglas fir and grand fir become the dominant or co-dominant conifers in most places, along with ponderosa pine and cedar.

Common vegetation community types within the Lolo Creek Canyon are described in Section 3.5, and includes deciduous riparian and upland conifer habitats, and developed/disturbed land. The two-mile wildlife analysis area also consists of patches of agricultural vegetation and shrubland and grassland, mainly at the periphery (USGS 2012).

Lolo Creek canyon provides important year-long habitat for big game animals such as elk (*Cervus elaphus*), whitetail deer (*Odocoileus virginianus*), mule deer (*O. hemionus*), black bear (*Ursus americanus*) and mountain lion (*Felis concolor*) (Mancuso 1996). River otter (*Lutra canadensis*) utilize the Lolo Creek aquatic and riparian habitats. Many other mammals such as coyotes (*Canis latrans*) and bobcat (*Felis rufus*) are also found in the project area. Upland game bird species include Merriam's wild turkey (*Meleagris gallopavo*), California quail (*Callipepla californica*), ruffed grouse (*Bonasa umbellus*), blue grouse (*Dendragapus obscurus*), spruce grouse (*D. canadensis*) and chukar partridge.

Douglas-fir forest habitats in the Lolo Creek Canyon provide important bird habitat, particularly for neotropical migrants (Mancuso 1996). Lower-elevation Douglas-fir/western larch class of conifers have been identified as key habitat for Idaho's neotropical bird populations. Developed/disturbed and agricultural lands that undergo persistent disturbance are more prone to invasive species infestation and generally provide lower-quality habitat for wildlife. Reptile and amphibian species that may occur in the project area are discussed under "BLM Sensitive Species" in Section 3.6.1.2, below.

No amphibian, reptile or mammalian species were directly observed during June 2011 site investigations. Bird species detected visually or by song during June 2011 site investigations included Dusky Flycatcher (*Empidonax oberholseri*), Western Flycatcher ("Pacific Slope" Subspecies *E. difficilis*), Yellow-Rumped Warbler (*Setophaga coronata*), Western Tanager (*Piranga ludoviciana*), Golden Crowned Kinglet (*Regulus satrapa*), Swainson's thrush (*Catharus ustulatus*), Winter Wren (*Troglodytes troglodytes*), American Robin (*Turdus migratorius*), Steller's Jay (*Cyanocitta stelleri*), Turkey Vulture (*Cathartes aura*), Belted Kingfisher (*Ceryle alcyon*), and Song Sparrow (*Melospiza melodia*) (HDR 2011c).

3.6.1.2 Migratory Birds

Idaho Partners in Flight (2000) have identified 243 species of birds that breed in the State of Idaho. Of these species, 119 are considered Neotropical migrants. Neotropical birds utilize habitats of the U.S. during the spring/summer breeding/nesting season, but migrate to southern latitudes to spend winters as far south as Mexico and South America.

Idaho Partners in Flight identified four high-priority habitats in Idaho, which also include important habitats for migratory birds: riparian; low-elevation, mixed conifer; and ponderosa pine (Idaho Partners in Flight 2000). Two of these habitats occur within the immediate project/analysis area and include: (1) riparian habitat; and (2) low elevation mixed conifer habitat. Douglas-fir forest habitats in the Lolo Creek Canyon provide important bird habitat, particularly for neotropical migrants (Mancuso 1996). Several

BLM sensitive bird species are neotropical migrants which utilize riparian or low elevation mixed conifer types (see Table 3-7 below).

3.6.1.3 Special Status Species

ESA-Listed Wildlife

Five federally-listed and proposed species that may occur in Clearwater and Idaho counties are Canada lynx (*Lynx canadensis*, threatened), northern Idaho ground squirrel (*Spermophilus brunneus brunneus*, threatened), the yellow-billed cuckoo (*Coccyzus americanus*, **candidate**), and wolverine (*Gulo gulo luscus*, candidate) (HDR 2012). Based on discussions with biologists familiar with the site and/or the habitat requirements for the above-listed species, none of these species occur and there is not suitable habitat in the analysis area (HDR 2012). Because the project/analysis area does not provide suitable habitats for the above ESA-listed and candidate species and no documented records exist for the project/analysis area; there would likely be ***no effect*** on ESA-listed wildlife from the Proposed Action.

State - Sensitive Species

Available data from IDFG does not list any state-sensitive wildlife species in the analysis area (IDFG 2011). Lolo Creek contains suitable habitat for harlequin ducks, a state **Species of Special Concern** (Mancuso 1996). Sightings have been reported for Lolo Creek, but no systematic surveys have been conducted. Mountain quail, another state Species of Special Concern, were historically present in the area and a remnant population may still persist (Mancuso 1996).

BLM Sensitive Species

BLM Manual 6840, *Special Status Species Management*, requires that sensitive animal species be managed with the same level of protection as candidate species, to avoid being listed as threatened or endangered in the future. BLM-sensitive wildlife species that occur or potentially could occur within the Lolo Creek Analysis Area, along with preferred habitats for each species are listed in Table 3-6, Table 3-7, and Table 3-8 (Johnson 2011).

Table 3-6. BLM Sensitive Species (Mammals) - Cottonwood Field Office Area.

Common Name	Genus - Species	Habitat
Fisher	*Martes pennanti*	Dense canopied, timber types at mid to higher elevations. Dead and down timber in grand fir, Douglas fir, or other conifer types are most preferred.
Fringed Myotis	*Myotis thysanodes*	Large trees, caves, mine tunnels, attics of old buildings. Food is primarily insects.
Gray Wolf	*Canis lupus*	Gray wolves preferred habitats are associated with good quality **ungulate** (elk and deer) habitats. Elk and deer are important prey species for gray wolves. Critical habitat niches for gray wolves are associated with den sites and **rendezvous sites**, with minimal effects from human disturbance. The gray wolf was delisted (**experimental non-essential population**) as an ESA-listed species in 2011. The gray wolf is currently managed by Idaho Department of Fish Game, and the species has authorized hunting and trapping for the species in accord with state regulations.

Table 3-7. BLM Sensitive Species (Birds) - Cottonwood Field Office Area.

Common Name	Genus - Species	Habitat
Bald Eagle	*Haliaeetus leucocephalus*	Winter habitat for the bald eagle is primarily associated with the larger rivers and corridors, such as the Snake, Salmon, Clearwater River, South Fork Clearwater Rivers; and Dworshak Reservoir. Bald eagles will also utilize lower elevation uplands and prairie areas during winter periods, particularly if **carrion** is available. Winter habitat for bald eagles is a function of perch and roost site availability, as well as access to fish, waterfowl, and ungulate carrion as forage/prey. Nest sites have been documented in the Dworshak Reservoir area, along Clearwater River, and along Salmon River. The bald eagle was delisted as an ESA-listed species in 2007.
Northern Goshawk	*Accipiter gentilis*	Forests, forest edge, open woodlands. Most common in ponderosa pine, lodgepole pine and Douglas fir forests. Riparian habitats in winter. Nests are masses of twigs in tall conifers. Foods are tree squirrels, jackrabbits, ground squirrels, small birds, and occasionally grouse.
Flammulated Owl[1]	*Otus flammeolus*	Montane forests, open stands of fire-climax ponderosa pine or Douglas-fir forests. Nests in abandoned woodpecker holes.
Harlequin Duck	*Histrionicus histrionicus*	In Idaho, breeds on forested mountain streams of relatively low gradient free of human disturbance. Feeds primarily on crustaceans, mollusks, insects, and a few small fishes. Has been found in Lochsa River and Lolo Creek drainages.
Lewis Woodpecker[1]	*Melanerpes lewis*	Open or logged forests, river groves in mountains. Nest is a hole in tree. Foods are insects, berries, and fruits.
White-headed Woodpecker	*Picoides albolarvatus*	Montane coniferous forests primarily dry open forests with ponderosa pine and Douglas fir. Nest is a hole in tree or stump, often close to ground. Food is primarily insects.
Williamson's Sapsucker[1]	*Sphyrapicus thryoideus*	Coniferous forests and burns at higher elevations in mountains. Nest is a hole in tree. Foods are sap, insects and inner bark.
Mountain Quail	*Oreotys pictus*	Riparian areas, shrub mountainsides, coniferous forests, and forest edge. Nests on ground. Foods are buds, seeds, grain, and insects.
Olive-sided Flycatcher[1]	*Contopus borealis*	Open timber at meadow margins in sparse timber, burns, partially logged areas. Nest is woven twigs near end of a horizontal limb of a conifer. Food includes insects caught while flying.
Hammond's Flycatcher[1]	*Empidonax hammondii*	Mountains, in partially logged forests, open woods and along forest edges at medium and lower elevations. Nest is woven cup of vegetation in deciduous tree. Eats insects such as beetles, moths, flies, bees, and wasps.
Willow Flycatcher[1]	*Empidonax traillii*	Riparian areas, swamps, willow thickets, open woodlands. Builds cup shape nest in shrub or deciduous tree. Food is primarily insects.
Calliope Hummingbird[1]	*Stellula calliope*	Foothills and forested mountains. Nests in conifers. Foods are nectar and insects.

[1]Neotropical Migrants

Table 3-8. BLM Sensitive Species (Reptiles and Amphibians) - Cottonwood Field Office Area.

Common Name	Genus - Species	Habitat
REPTILES		
Common Garter Snake	*Thamnophis sirtalis*	Inhabits wet or moist habitats. Preys primarily on earthworms, frogs, toads, salamanders, and fish.
AMPHIBIANS		
Coeur d'Alene Salamander	*Plethodon idahoensis*	Found in three primary habitats, which include springs or seepages; spray zones of waterfalls; and edges of streams. Often associated with fractured rock. Found in forested areas of northern Idaho. Areas within north central Idaho include the North Fork Clearwater River, Lochsa River, and Selway River drainages.
Idaho Giant Salamander	*Dicamptodon aterrimus*	Larvae usually inhabit clear, cold streams, but are also found in mountain lakes and ponds. Adults are found under rocks and logs in humid forests, near mountain streams, or on rocky shores of mountain lakes. Larvae feed on wide variety of aquatic invertebrates as well as some small vertebrates (e.g., fishes, tadpoles, or other larval salamanders). Adults eat terrestrial invertebrates, small snakes, shrews, and salamanders.
Western Toad	*Bufo boreas*	Streams, springs, grasslands, woodlands, mountain meadows. Usually in and/or near ponds, lakes, reservoirs, rivers, streams. Food is primarily insects.

3.6.2 Environmental Effects

The following text describes anticipated direct and indirect effects to wildlife and habitat, special-status species, and BLM sensitive species due to construction and operation of facilities included in the Proposed Action, as well as due to the No Action Alternative. Effects related to construction would primarily occur in the two-mile analysis area (Figure 3-2), and effects to habitat due to operation of the weir would mainly occur in the project ROW.

3.6.2.1 Proposed Action

Wildlife/Habitat

Construction and operational activities associated with the Proposed Action could result in short-term direct and indirect effects on wildlife resulting from the loss, modification, and degradation of habitats and disturbance to species. These effects would be ***low*** due to the relatively small area affected.

Clearing of vegetation and other site-preparation activities could cause direct wildlife injury or mortality or could displace wildlife into adjacent habitats; however, as discussed in Section 3.5, temporary and permanent vegetation clearing would mainly occur on previously disturbed land; clearing of native riparian and upland forested habitat would be limited to the removal of three mature conifers on the south bank, and about 50 feet of thin-alder (with an understory of invasive reed canary grass) on the north bank. These effects are considered ***low***. Vegetation removal would not cause fragmentation of communities since the site is already disturbed and vegetation to be cleared is located along the outer edge of large tracts of similarly-vegetated areas on both banks. Only three mature trees would be removed from the 2.4-acre project footprint, and the surrounding habitat is densely forested with mature conifers on both banks of the Lolo Creek canyon.

Sedimentation from construction activities could affect breeding and rearing habitat for amphibians associated with Lolo Creek. Spills of oil, gasoline, concrete, or other toxic substances could injure

waterfowl or other aquatic wildlife. However, measures to avoid or minimize these effects would include using erosion control barriers and implementing other mitigation measures as detailed in Section 2.1.3 and impacts would be ***low***.

Temporary noise from construction activities could disturb wildlife, particularly nesting birds. Construction noise could cause stress and alter behavior patterns, therefore interfering with activities such as reproduction and feeding. Loud construction activities could displace some animals and cause them to move to similar habitats elsewhere, or discourage them from using adjacent habitats. However, because the majority of construction would occur during the summer instream work window (August – October), critical springtime breeding and nesting periods would be largely be avoided. Impacts to wildlife and wildlife habitat from construction of the Propose Action would be ***low***.

Operation and maintenance of the facilities could result in direct effects such as accidental spills into Lolo Creek, which could affect water quality. No fuel or oil would be stored on-site. Synthetic (vegetable based) oil used in the hydraulic system would be tight-lined in steel pipes embedded in the concrete sill, and hydraulic lines servicing the weir would be buried. These environmental design features should minimize the potential for negative effects to wildlife due to spills. Noise from human disturbance and operation of the weir would be minor and would not be expected to disrupt animal behavior. Impacts to wildlife and wildlife habitat from operation and maintenance of the Proposed Action would be ***low***.

Potential indirect effects to wildlife could occur if the creation of public facilities increases public use of the site, and thus, increases human disturbance within the project area. However, the increase in public use is expected to be minor and thus, indirect impacts to wildlife and wildlife habitat due to the Proposed Action are anticipated to be ***low***.

Migratory Birds

The primary species that could potentially be impacted by the Proposed Action include riparian-dependent species, followed by species that occupy low-elevation mixed conifer habitats such as neotropical migrants and migratory birds. Disturbance during the bird breeding/nesting season would constitute the primary impact, and a small loss of riparian/aquatic habitat would also occur. Operation of the temporary weir and other human activities currently result in disturbance at the site; however, new construction activities and a proposed longer period of operation of the permanent weir would constitute an additional ***low*** effect to migratory birds.

Instream construction activity would occur after breeding/nesting seasons. Migratory birds that utilize adjacent low-elevation mixed conifer habitats are expected to experience ***low*** effects, primarily due to potential disturbance (e.g., human activity, noise). No habitat modification would occur to forested upland habitats as a result of project implementation. For additional effects analysis concerning neotropical migrants, refer to BLM sensitive species section below and species identified as neotropical migrants (see Table 3-7, above).

BLM Sensitive Species

As with general wildlife affects discussed above, construction of the weir and associated facilities could cause temporary direct noise and water quality effects to BLM sensitive species due to construction, and effects associated with increased human disturbance from creation of public facilities. Overall, these effects are considered ***low*** due to small localized project area (i.e., 2.4 acres), their short-term nature and the existing level of human disturbance in the area.

The proposed project occurs within and adjacent to Lolo Creek (i.e., RCA and riparian areas). The project/analysis area provides aquatic, riparian and upland forest/shrub habitats, which provide potential habitat for a variety of BLM-sensitive species (see Tables 3-6, 3-7, and 3-8 above). The Proposed Action would result in varying levels of effects on BLM-sensitive wildlife species and preferred habitats. Many of the BLM-sensitive species listed in the above Tables 3-6, 3-7, and 3-8 may occur within the general

analysis area; however, due to a lack of known sightings, critical habitat niches (e.g., nest site, den site, etc.), or optimum preferred habitats in the immediate project area (e.g., old growth, upland forest habitats, etc.), the Proposed Action will likely have ***no effect*** on BLM sensitive species.

The Proposed Action is not anticipated to affect several other BLM-sensitive species including the fringed myotis, bald eagle, northern goshawk, flammulated owl, Lewis woodpecker, white-headed woodpecker, olive-sided flycatcher, Hammond's flycatcher, calliope hummingbird, and Coeur d'Alene salamander. Bald eagle and Coeur d'Alene salamander utilize riparian/aquatic/RCA habitats; however, no bald eagle nest sites are known to occur in the Lolo Creek drainage and the area does not provide preferred wintering habitat; and no known occurrences or reports of Coeur d'Alene salamander exist for the Lolo Creek drainage. For this reason, the Proposed Action will likely have ***no effect*** on both species.

The common garter snake, Idaho giant salamander, and western toad are less mobile and therefore more prone to injury or mortality due to project-associated actions within preferred riparian/aquatic habitats and the RCA (see Table 3-8 above). The fisher, harlequin duck, mountain quail, and willow flycatcher potentially could use aquatic/riparian areas and RCA areas adjacent to Lolo Creek; which would be impacted by project implementation. As such, these species may be subject to disturbance and displacement. However, the proposed project would impact a very small area of preferred habitat within and adjacent to Lolo Creek (project area and RCA); consequently, overall effects to these species would be low. In addition, current operation of the temporary weir and other human disturbances in the area have already resulted in varying levels of impacts to these BLM-sensitive species.

Gray wolves have been documented within two miles of the project area; however, no den or rendezvous sites would be impacted by the proposed project. Short term impacts from disturbance or displacement to gray wolf and preferred prey species (e.g., elk, deer) are not anticipated to occur due to construction activities. Installation of the permanent weir would result in increased human activities from operation of the weir for an extended period of time during spring and winter (up to an additional five months). Overall, however, ***no*** long term effects to preferred prey species (e.g., elk, deer) or important big game ungulate winter range habitats would occur due to the small, localized size of the project area.

The Proposed Action would result in low levels of impact to preferred habitats (e.g., riparian/RCA habitats) for the gray wolf, fisher, harlequin duck, willow flycatcher, common garter snake, Idaho giant salamander, and western toad. Overall, the short term and long term effects to these species would be ***low,*** since habitat disturbance would be small and localized.

3.6.2.2 No Action Alternative

Under the No Action Alternative, ongoing operational effects associated with existing installation and removal of the existing seasonal weir would continue, which could include minor effects to vegetation in disturbed and riparian habitats on the north bank of Lolo Creek, and human activity that could cause temporary disturbance and displacement of wildlife. These effects would be similar to the Proposed Action, however, would not include the new weir construction impacts and longer duration of human activities that would allow operations to occur prior to and during high flow conditions (up to an additional five months).

3.7 Special Designations - Area of Critical Environmental Concern and Wild and Scenic River System

3.7.1 Affected Environment

This section summarizes potential effects to special designations that are applicable to Lolo Creek. Lolo Creek is designated as an Area of Critical Environmental Concern (ACEC), and has been preliminarily determined to be suitable for designation under the National Wild and Scenic River System (NWSRS).

Area of Critical Environmental Concern

The proposed project site is located within the Upper Lolo Creek ACEC, which was designated by the BLM for the protection and conservation of its high value cultural resources, ecological resources, and special status fish, wildlife, and plants. Existing conditions relative to biological and ecological resources related to the ACEC designation were discussed above, in Sections 3.3, 3.5, and 3.6. Cultural resources are discussed in Section 3.11.

Wild and Scenic River

The BLM has preliminarily determined Lolo Creek to be suitable for Congressional designation into the NWSRS (BLM 2009). Although preliminarily determined suitable for designation, as of this writing, the BLM does not recommend the 27.19-mile Lolo Creek segment for congressional designation (BLM 2009). Rivers found eligible or suitable for the NWSRS through federal agency planning processes are not protected by the Wild and Scenic Rivers Act from proposed hydroelectric facilities or other federally-assisted water resources projects that have the potential to affect the river's free-flowing characteristics and other identified values. However, the managing agency is recommended to protect the values that make the river eligible or suitable.

The BLM determined that Lolo Creek contains the following ORVs: fisheries, recreation, scenic, and historic (BLM 2009). Baseline condition of ORVs for which Lolo Creek was preliminarily determined to be eligible for Wild and Scenic River designation are discussed in the following Sections (Affected Environment): Section 3.3.1 Aquatic Habitat and Special Status Species; Section 3.4.1 Water Resources; Section 3.8.1 Recreation; Section 3.10.1 Visual Quality and Aesthetics; and Section 3.11.1 Cultural Resources. Also refer to Appendix B, the project's Wild and Scenic Section 7 Analysis, for background information, and a detailed discussion of ORVs in Lolo Creek.

3.7.2 Environmental Effects

3.7.2.1 Proposed Action

Area of Critical Environmental Concern

Under the Proposed Action, potential effects to the unique and valuable resources for which the Upper Lolo Creek ACEC was designated are discussed in the following Sections (Environmental Effects): Section 3.3.2 Aquatic Habitat and Special Status Species; Section 3.4.2 Water Resources; Section 3.6.2 Terrestrial Wildlife Habitat and Special Status Species; Section 3.10.2 Visual Quality and Aesthetics; and Section 3.11.2 Cultural Resources. The Proposed Action would result in ***low*** level, long-term effects to resources associated with the ACEC designation.

Wild and Scenic River

Under the Proposed Action, potential effects to the ORVs for which Lolo Creek was preliminarily determined to be eligible for Wild and Scenic River designation are discussed in the following Sections (Environmental Effects): Section 3.3.2 Aquatic Habitat and Special Status Species; Section 3.4.2 Water

Resources; Section 3.8.2 Recreation; Section 3.10.2 Visual Quality and Aesthetics; and Section 3.11.2 Cultural Resources.

The project-specific Wild and Scenic River Section 7 Analysis (Appendix B) presents background information, a description of ORVs in Lolo Creek, and a thorough analysis of project-related effects to ORVs, hydrology, water quality, and stream channel morphology. The analysis concluded that, overall, the Proposed Action would result in ***low***, long-term effects to ORVs (fisheries, recreation, scenic and historic).

Because the weir would be a flow-through facility, the Proposed Action would not affect the free-flowing nature of Lolo Creek. Through the implementation of the environmental design features/mitigation measures described in Section 2.1.3, the Proposed Action would not adversely affect the ORVs identified for NWSRS suitability, or potential designation in the future.

3.7.2.2 No Action Alternative

The No Action Alternative would have ***no effects*** to the unique and high value resources in the Upper Lolo Creek ACEC or the free-flowing characteristic and other values identified for making Lolo Creek eligible or suitable for protection under the NWSRS. Existing conditions and trends would continue for these identified high resource values. Improved steelhead trout and spring Chinook salmon management data collection and management opportunities for enhancing these high value resources would not occur, which was one of the primary high resources identified for ACEC and NWSRS suitability or eligibility.

3.8 Recreation

The analysis area for recreation is the Lolo Creek mainstem due to potential effects to recreational uses, primarily boating, during periods of weir operation. The analysis area is located in the 5,126-acre Lolo Creek Special Recreation Management Area (SRMA). The Lolo Creek mainstem spans from the confluence with the Clearwater River upstream to the USFS boundary. Issues addressed in this section include a description of the affected environment and an evaluation of the short-term and long-term direct and indirect effects of the alternatives on recreation use within the analysis area.

The BLM's Cottonwood Resource Management Plan (RMP) specifies that the Lolo Creek SRMA should be "managed as an **undeveloped recreation-tourism market** for residents and visitors" (BLM 2009). The SRMA **Recreation Niche** includes managing the area "to provide backcountry, dispersed, non-motorized recreation opportunities in an undeveloped setting with an emphasis on whitewater boating and fishing" (BLM 2009). BLM has proposed to manage Lolo Creek as a SRMA through the Cottonwood RMP.

3.8.1 Affected Environment

Recreational uses in the analysis area include a frequently-used summer swimming area that is located approximately 0.13 RM upstream of the project area on lands owned by the Idaho Department of Lands (IDL), fishing along the banks above and below the bridge, and popular boating opportunities (Figure 3-3), as well as hiking and wildlife viewing.

According to the BLM, the lower ten miles of Lolo Creek (beginning just downstream of the Lolo Creek Road/Woodland Bridge) contain one of the best whitewater runs in Idaho (BLM 2006). In addition, American Whitewater reported that this area contains the best whitewater in the creek (American Whitewater 2006). In 1995, the BLM estimated that 15 individual kayakers typically boat Lolo Creek at least once per year, and the BLM Cottonwood Field Office staff report that the creek is high on many boaters' wish-list of creeks to boat (Culver 2012). The majority of boaters appear to originate from Moscow and Boise, Idaho and Missoula, Montana (Culver 2012). The creek is boat-able from April to mid-July depending on the water flows and type of craft (small raft, kayaks and duckies), though there

have been reports of boat trips as early as the second week of March (Culver 2011). During extremely high flow years, Lolo Creek is anticipated to be boat-able until mid to late August (Culver 2011).

The recommended put-in for boaters is located immediately downstream of the Lolo Creek Road/Woodland Bridge, at the existing seasonal weir site (American Whitewater 2006). Although there is an upper river put-in (Amaral 1990), the few extra 3+/4 rapids that individuals will encounter "aren't worth the added time it takes" to access the upper put-in (American Whitewater 2006). Based on the information presented above, the recreational ORV, with respect to boat-able reaches of Lolo Creek, appears to be predominantly utilized in the lower portions of the creek, accessed just downstream from the existing weir location (see Figure 3-3).

Other recreation activities in the analysis area includes a mixture of photography, sightseeing, hunting, fishing, camping, hiking, and general visitor use that occurs on federal lands managed by the BLM and state lands managed by the IDL. Lolo Creek is popular for day users to pick berries, firewood collection, swimming, fishing, and general picnicking. In general, peak use is during the summer months, and in the hunting season which extends from late August to early November. A recently installed road counter at the Lolo Creek Road/Woodland Bridge indicates that the average daily use of the project area is about 40 car trips. Peak monthly trips are near 500 during the summer months (BLM 2012a).

The recreation analysis area includes landscapes in a natural state and those that have been altered by resource management. These areas are viewed from roads and Lolo Creek. Trail segments used infrequently by horsemen are located approximately ½ mile south, uphill, of the creek, though the project site cannot be viewed from this trail. No hiking trails are located within the project ROW. Please refer to Section 3.11, Cultural Resources, for more details on these trails.

There is demonstrated demand for minimal recreation facilities including designated parking and human waste facilities at Lolo Creek Road/Woodland Bridge to support whitewater boating, fishing and swimming. The demonstrated demand of parking vehicles in and around the current fish weir facilities and the use of the NPT porta-potties by as many as 30 people (Sprague 2012b) a day during the months of July, August and September indicates that the installation of the recreation facilities as part of this proposed project would fulfill the recreation niche as described above.

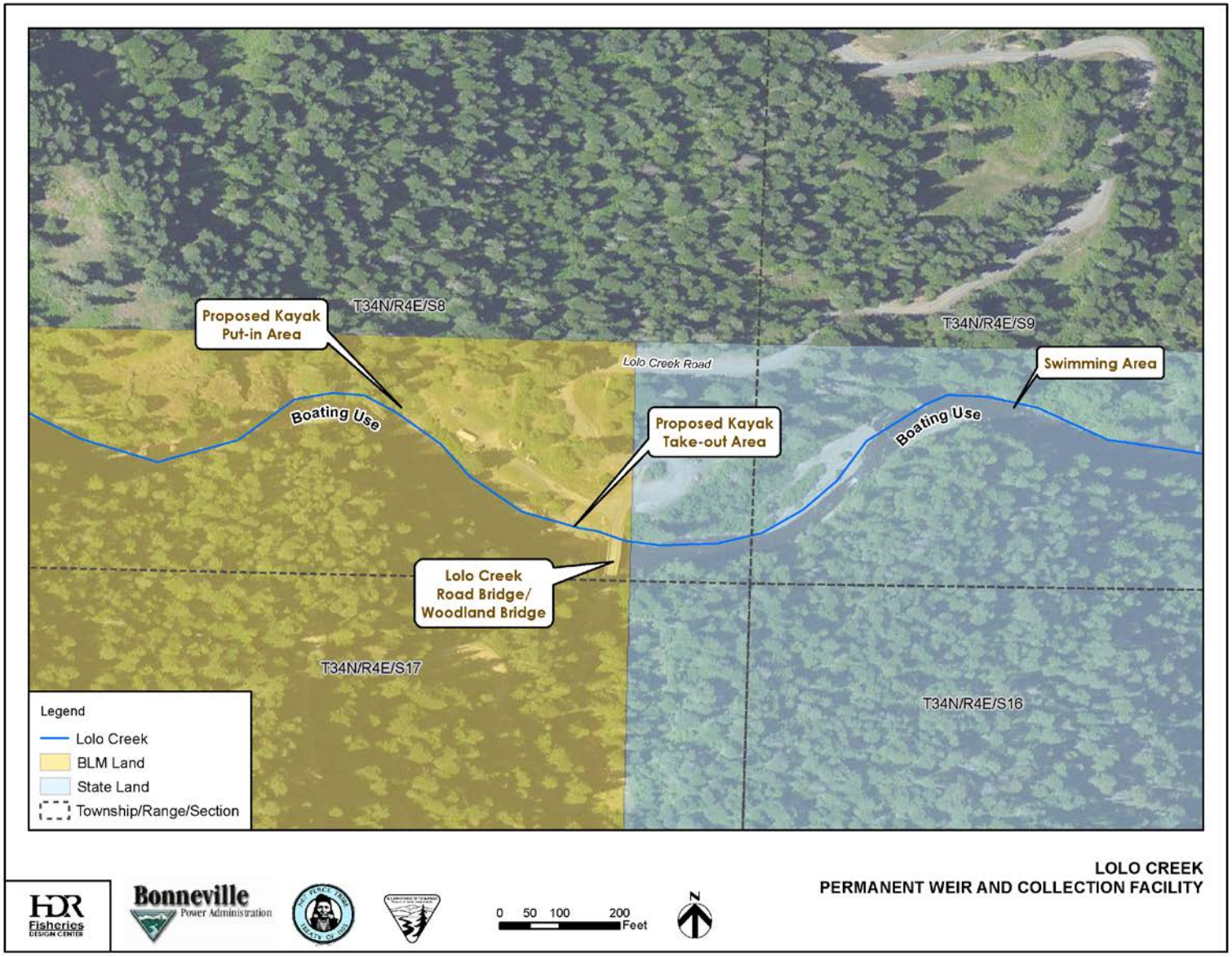

Figure 3-3. Recreation Use and Features.

3.8.2 Environmental Effects

The following section addresses the direct and indirect effects of the Proposed Action and the No Action Alternative within the recreation analysis area. Refer to Section 3.11, Cultural Resources, for discussion of potential effects on historic trails.

3.8.2.1 Proposed Action

The Proposed Action would result in short-term, direct effects on recreation users including: temporary levels of elevated noise, dust, and odors from construction equipment, heavy machinery and haul trucks; and temporary access restrictions due to construction activities. These effects could alter the quality of recreation during the construction period (approximately eight months). These effects would be short-term and would vary in magnitude from ***low*** to ***moderate***, depending on the extent and duration of the disruption and would be mitigated by the implementation of environmental design features (Section 2.1.3).

Recreation Access During Weir Construction

Access to Lolo Creek during the typical boat-able period (April through mid-July) of the weir construction year (2013) would be available to boaters since instream work would not commence until August. However, parking may not be available to all users of the site at all times since construction equipment would be staged along the north bank, and upland work could commence as early as April. Boaters typically park just upstream of the bridge along Lolo Creek Road within IDL lands and at the put-in location just downstream of the temporary fish weir. Several put-in locations and parking areas would remain available on either bank until instream work commences in August.

The project area would likely not be accessible to boaters during the construction period due to potential public safety concerns at the active construction site. However, boaters do not typically run the creek during the instream work window (August – October) due to low flows.

Construction of the Proposed Action could temporarily displace some recreational users from the project area. This displacement of recreational users could increase pressure on recreational use elsewhere in the analysis area, resulting in a short-term indirect effect on other recreation areas. This indirect effect would be temporary and is considered to be ***low*** because the number of recreational users affected would be relatively low, and users would be informed by public outreach of the construction and thus could choose to use other recreational areas for the season. During construction, all equipment would be staged, stored and operated on the ROW parcel. Construction staging and use would not extend to the adjacent IDL property and parking availability would not be directly affected by the Proposed Action.

Recreation Access During Weir Operation

The extended fish collection and monitoring period associated with the Proposed Action (January through September) could have a long-term direct effect on whitewater boating use. If boaters were to encounter the raised weir during operation, they would not be able to pass over it and would need to take their boats out and portage around the weir. The rare boater who launches upstream of the weir site would likely encounter the weir barrier during the typical boating season, unless the weir was lowered for downstream bull trout or steelhead passage, sediment flushing, or prohibitively high flow conditions. The Proposed Action would thus result in the loss of approximately 100 yards of boating opportunity at the weir location (from the bridge to the downstream put-in). Environmental design features such as signage and designated onsite parking for recreational users (Section 2.1.3) would mitigate these effects, and the impact on recreational access during weir operation is anticipated to be ***low*** because of the small number of affected boaters and the small area that would be lost compared to the total area available for boating.

During extreme low flow periods (under 10 cfs), all flow would pass through the fishway or low flow notch. This would allow continued fish passage around the sill. During these relatively rare low flow periods (August/September), boating is typically not possible in the project area, so this low flow passage mechanism would have ***no effect*** on recreational boating use. If higher flows persist during August, recreational boaters would be required to take-out upstream of the weir; thus, under these conditions, operation of the weir would have ***low-to-moderate*** effects on recreational boating.

The Proposed Action would have ***no effect*** on the public swimming area upstream or fishing adjacent or below the project area, boating on the lower 10 river miles of Lolo Creek, or the recreational use of trails in the analysis area since the trails do not directly traverse the project area.

3.8.2.2 No Action Alternative

Under the No Action Alternative, ongoing NPT seasonal weir operations would continue to result in ***low*** direct effects on recreation. Under this alternative, recreational improvements such as the addition of public restroom, recreational parking and the put-in and take out would not be made; however, boating recreationists would not encounter the weir during the spring months of March and April. Boaters would continue to be required to portage around the temporary weir during seasonal operations (as early as May through September).

3.9 Transportation

The analysis area for transportation includes the project area and the surrounding 1-mile radius (see Figure 3-4). Issues addressed in this section include a description of the affected environment and an evaluation of the temporary and permanent effects of the alternatives on transportation within the analysis area.

3.9.1 Affected Environment

3.9.1.1 Existing Transportation Access

Road access to the lower portion of Lolo Creek is extremely limited. Access to the project site is provided by Lolo Creek Road, which is a low-volume gravel road. Lolo Creek Road crosses Lolo Creek at the Lolo Creek Road/Woodland Bridge immediately upstream of the existing seasonal fish weir site, and approximately 1-acre along the north bank has been cleared to accommodate vehicular access and parking. The analysis area for transportation includes areas on Lolo Creek between Idaho County (south side) and Clearwater County (north side) (see Figure 3-4). Both counties maintain the roads in the analysis area and the existing Lolo Creek Road/Woodland Bridge is maintained by the Clearwater Highway District.

In the greater vicinity of the existing seasonal fish weir site, Lolo Creek Road connects to a series of local roads and highways. Lolo Creek Road connects to Caribel Road, Rupp Road, and Woodland Road to the south. This roadway network then connects to U.S. Highway 12. Lolo Creek Road also connects to Three Mile Road to the north. This roadway network then connects to Idaho State Highway 11 (see Figure 3-5).

The primary users of the existing transportation access include the NPT, federal and state land managers, recreational users, and residents. There is currently no dedicated access or parking areas for recreational use at the existing seasonal fish weir site.

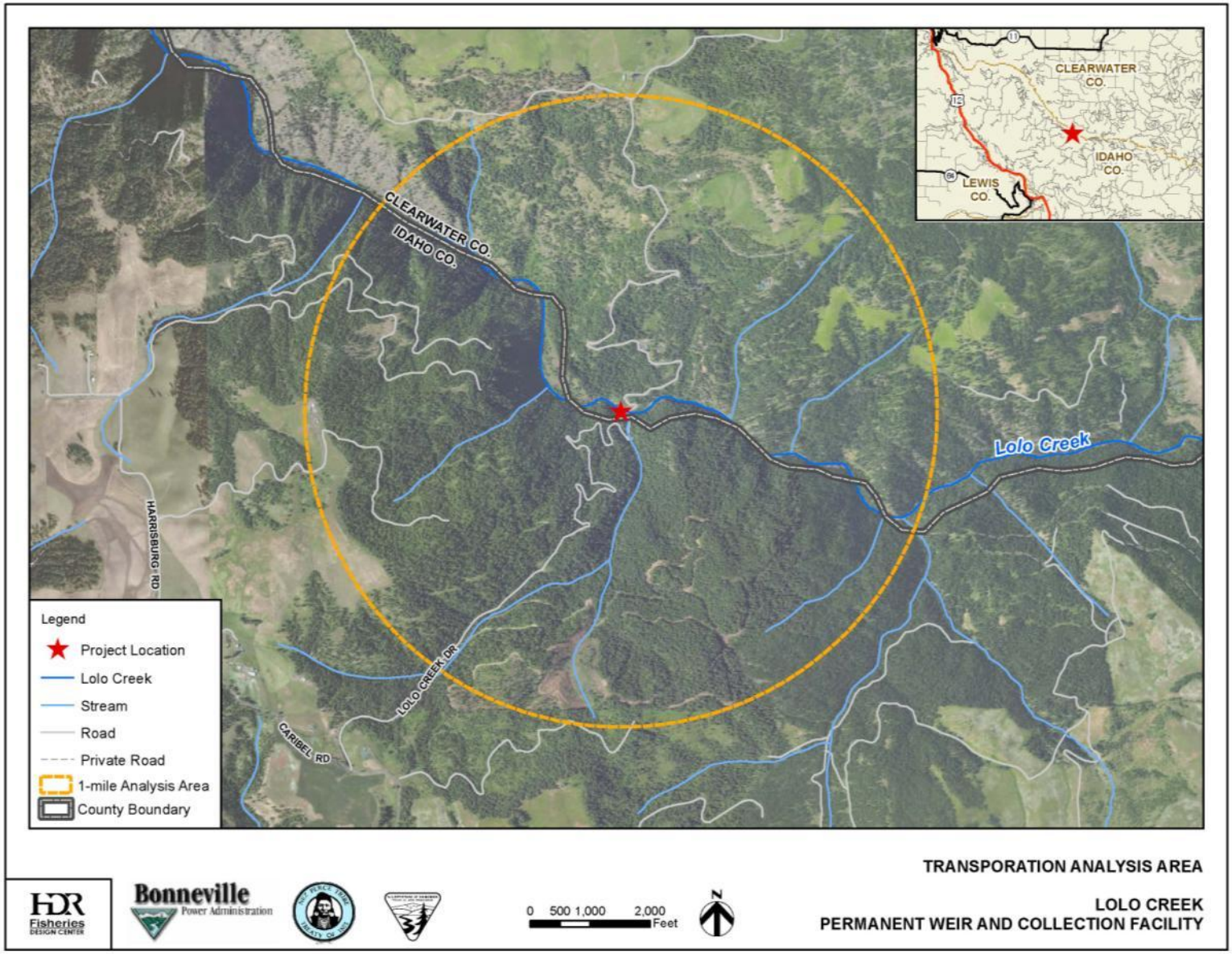

Figure 3-4. Transportation Analysis Area.

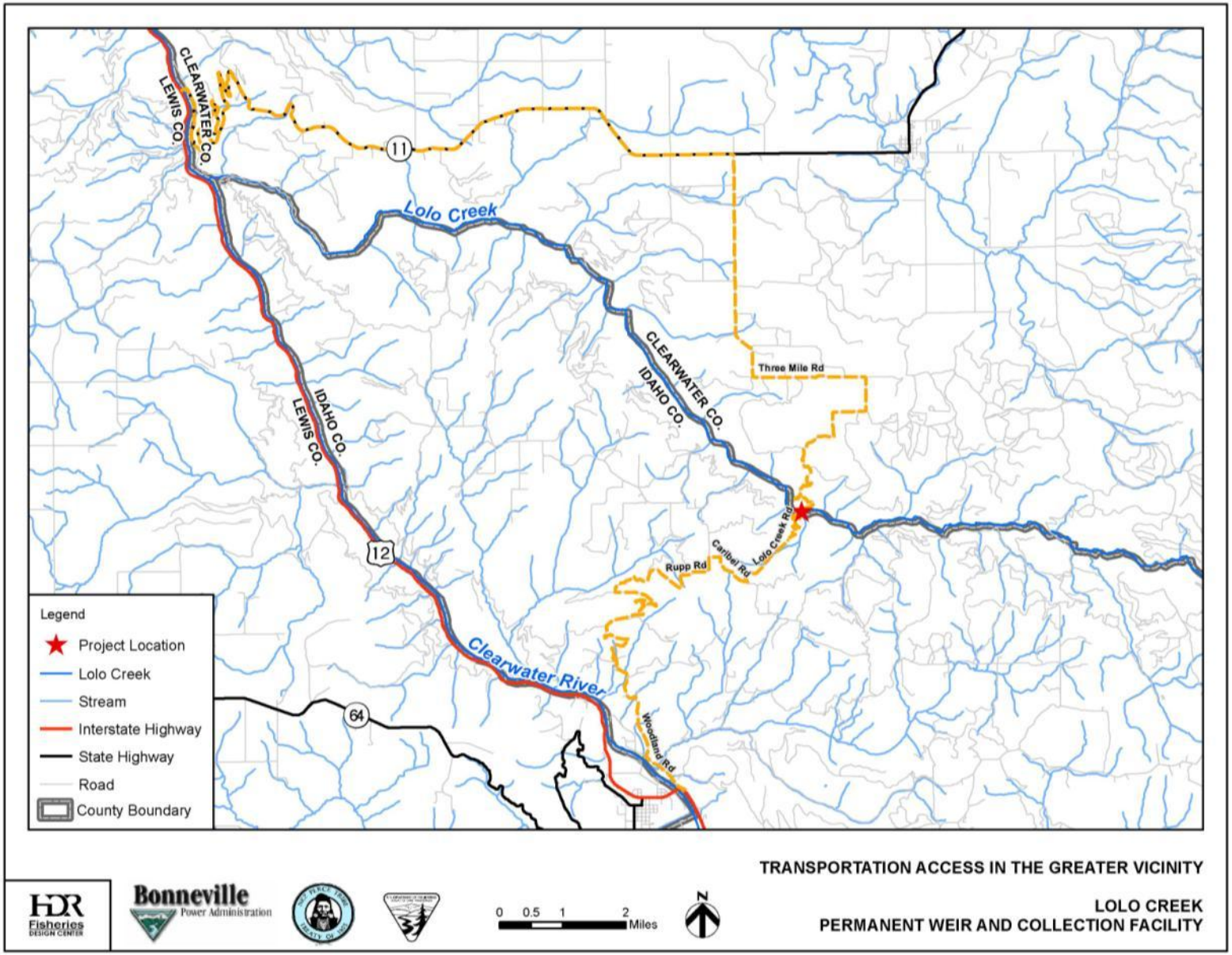

Figure 3-5. Transportation Access in the Greater Vicinity.

3.9.1.2 Existing Transportation Operations

For current use of the seasonal fish weir site by the NPT, approximately one to two daily trips occur during normal seasonal operations, using Lolo Creek Road and the local road network. The seasonal weir has typically been present in the creek from mid-May through September for the past 10 years. A small group of residents also use Lolo Creek Road and the local road network for access, which results in approximately six to ten daily trips (Sprague 2012b). Roadways immediately adjacent to Lolo Creek Road are rural and experience light traffic volumes. Volumes on the state and federal highways in the outlying area are greater because they carry more regional traffic. For example, on U.S. Highway 12, average daily traffic volumes ranged from 1,600 vehicles to 2,500 vehicles in the vicinity of Kamiah, Idaho (Idaho Department of Transportation 2012).

The Idaho County portion of Lolo Creek Road is closed during the winter since the road is not maintained. The Clearwater County portion of Lolo Creek Road is plowed down to the last residence, which is approximately one mile away from the existing seasonal fish weir site.

Existing Roadway Conditions

Lolo Creek Road is a small, steep, graveled travel surface (e.g., one to two travel lanes) that has sharp 180 degree turns, and it is not recommended for towing a trailer. For sections of the road that are open during winter, chains are necessary if there are four to six inches of snow on the road. During other times throughout the winter season, 4-wheel drive vehicles are required to navigate muddy conditions on the road surface. Lolo Creek Road also becomes dusty from vehicular traffic in the summer over dry weather periods. Due to the relatively low volumes of use on Lolo Creek Road, motor vehicle accident records are not available. One incident was identified; a vehicle with a trailer went off the embankment in 2011 while traveling on Lolo Creek Road (Sprague 2012b).

3.9.2 Environmental Effects

The following section addresses the direct and indirect effects of the Proposed Action and the No Action Alternative within the transportation analysis area. These effects can be both short-term and long-term in nature, and are described in detail below.

3.9.2.1 Proposed Action

Under the Proposed Action, it is estimated that approximately 600 truck trips would occur over the 8-month construction period. This increased use of Lolo Creek Road by construction vehicles would have short-term direct effects on residents and recreational users of the area. Weekday construction activity could result in extended travel times and restricted access on Lolo Creek Road and other access points. The periodic traffic delays and restricted access would be brief and infrequent. On average, there would be approximately ten truck trips per day. The temporary increase in construction-related traffic on Lolo Creek Road and other access points would represent an increase in daily traffic volumes compared with existing roadway use, but is not expected to substantially degrade traffic operations. Transportation effects during construction would be ***low***. To avoid or minimize transportation effects on users, signs would be posted along Lolo Creek Road warning of construction activity and temporary interruptions.

Direct short-term effects to recreational parking and access restrictions at the project site would occur during construction. For example, parking for boaters would not be available at the site at all times since construction equipment would be staged along the north bank, and upland work could commence as early as April. Several put-in locations would be available on either bank until instream work commences in August, and alternate boater parking is available upstream of the bridge along Lolo Creek Road. Potential effects on recreational parking and access restrictions would be ***low*** to ***moderate*** depending on the extent and duration of the disruption.

No indirect effects to transportation are anticipated. The Proposed Action would not upgrade or expand the capacity of Lolo Creek Road, thus indirect effects related to changes in recreation or land use would

not be anticipated. Occasional visitors to the weir could increase during operation; however, such an increase would result in ***low*** effects to transportation in the analysis area. The access and parking improvements are specifically limited to the existing site and the Proposed Action would allow continuation of an existing, authorized use.

Operation of the Proposed Action would result in an increase in daily trips compared to the existing operations, since the facility would be operated over an extended period of time (e.g., from five months seasonally up to 10 months annually). The Proposed Action would result in two to three daily trips versus the existing one to two daily trips. Given the minor change in daily trips under the Proposed Action, driving conditions and traffic operations on the local road network would not be diminished. Routine maintenance activities are expected to continue on Lolo Creek Road between local counties to sustain roadway conditions over the long-term. Direct operational effects on transportation would be ***low***.

As previously stated, signage would be installed under the Proposed Action to designate up to two parking spaces at the western-most end of the site. These parking spaces could be used by kayakers to provide access to the designated kayak put-in area, located along the north bank downstream of the proposed weir. This would result in a positive long-term direct effect on transportation by providing dedicated vehicular access and parking for recreational use.

3.9.2.2 No Action Alternative

Under the No Action Alternative, some minor traffic to and from the existing seasonal weir site would continue, and thus, effects on transportation would be ***low***. However, no construction or operational effects associated with the Proposed Action would occur.

3.10 Visual Quality and Aesthetics

The analysis area for visual quality and aesthetics is the existing 2.4-acre ROW associated with the existing Lower Lolo Weir. This area was identified in BLM's ROW Grant issued to the NPT on September 12, 2011. Issues addressed in this section include a description of the affected environment and an evaluation of the short-term and long-term effects of the alternatives on visual and aesthetic resources within the analysis area.

In addition, this section summarizes information provided in the technical analyses prepared for the Proposed Action, which includes the Wild and Scenic River Section 7 Analysis (Appendix B). Scenic ORVs are considered in the analysis of visual quality and aesthetics under the affected environment and the direct and indirect effects of the alternatives.

3.10.1 Affected Environment

Visual values are identified through the VRM Inventory (BLM Manual Section 8410; BLM 1986) and are considered with other resource values in the resource management planning process. Visual management objectives are established in conformance with the land use allocations. These area specific objectives provide the standards for planning, designing, and evaluating future management projects. The VRM Class II Objective is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. The project area falls under the VRM Class II category.

Under the National Wild and Scenic River System (NWSRS), the tentative classification for Lolo Creek is "Scenic" for a total segment length of 27.19 river miles, of which 14.3 miles are within BLM-administered lands. Scenic rivers are those with no impoundments and largely undeveloped shorelines, but that are accessible by roads in places. Lolo Creek is often boulder strewn, creating pleasing pool and drop hydrologic scenery (BLM 2006). The lower ten miles, beginning just downstream of the project

site, flows through a deeply incised canyon, with a heterogeneous riparian vegetation community ranging from forested areas with moss and fern understory to bare canyon walls and semiarid canyon grasslands.

Sensitive viewer groups in the analysis area likely include motorists driving by the project area, residents in the surrounding area, and recreational users. The analysis area includes landscapes in a natural state and those that have been altered by resource management. These areas are viewed from roads and trails in the analysis area. The existing sight-line for the project area is very limited due to the canyon-like nature of the site. The existing seasonal weir facility and associated upland infrastructure along the north bank can only be seen once a vehicle turns a near 90-degree bend along Lolo Creek Road, just before the Lolo Creek Road/Woodland Bridge crossing from the north (refer to Figure 3-3 for view of Lolo Creek Road entry and egress from site). Dense forest and steep terrain visually screen the site from vehicles approaching from the south until one is nearly at the Lolo Creek Road/Woodland Bridge.

Development along Lolo Creek and the analysis area is very limited due to the steep canyon walls and limited access. Lolo Creek Road provides visual access to the analysis area. It runs perpendicular to Lolo Creek until it crosses Lolo Creek Road at Woodland Bridge, approximately 12 miles upstream from the confluence with the Clearwater River.

One of the actions in the Cottonwood RMP states that the BLM should: "Maintain all recreation facilities and recreation use areas for public safety and aesthetics" (BLM 2009). The Cottonwood RMP further states that the BLM should manage the area "to provide backcountry, dispersed, non-motorized recreation opportunities in an undeveloped setting with an emphasis on whitewater boating and fishing" (BLM 2009).

The existence of the NPT seasonal weir and juvenile screw trap represents man-made changes in the analysis area's **viewshed**. The NPT seasonal weir, juvenile screw trap and associated facilities were in place prior to the RMP and Wild and Scenic River suitability studies.

3.10.2 Environmental Effects

The following section addresses the direct and indirect effects of the Proposed Action and the No Action Alternative within the visual quality and aesthetics analysis area. These effects can be both short-term and long-term, and are described in detail below.

3.10.2.1 Proposed Action

During construction, visual and aesthetic changes associated with construction equipment and activity would result in short-term direct effects. These visual and aesthetic changes would include views of grading and vegetation removal, stockpiling of construction materials, and the presence of heavy construction equipment. Construction noise and visual changes could also temporarily disrupt the visual quality and the enjoyment of Lolo Creek for recreational users in the project vicinity. The direct effect of these changes would be short-term, temporary, and ***low*** to ***moderate*** depending on their duration of the construction.

With respect to the scenic ORVs, the Lolo Creek Road/Woodland Bridge, NPT seasonal weir and juvenile screw trap were present during the eligibility and suitability determination for Lolo Creek under the NWSRS. The north bank of the creek in the project area has been cleared of riparian vegetation and seasonally houses NPT work trailers and porta-potties, four sets of concrete blocks, staff vehicles, work tents, and fish haul trucks are often present. Given the existing condition of the north bank (see photos in Appendix A), and the relative lack of functional riparian vegetation in the proposed fishway/trap location, the presence of heavy equipment during construction of the Proposed Action is not expected to further degrade the visual and aesthetic character of the analysis area.

The Proposed Action would also result in up to three mature cedars being removed on the south bank of the creek. This bank is densely forested and extremely steep, and numerous mature conifers occupy the hillside upslope of the ordinary high water mark. For this reason, it is unlikely that the loss of three trees would affect the visual character of the south bank. Furthermore, the loss of several trees immediately

adjacent to the water is not anticipated to result in a substantial loss of large woody debris recruitment, which would enhance scenic values downstream from a hydrologic perspective (creation of pools). The loss of these trees would be mitigated by planned enhancement of the riparian corridor along the north bank (see Section 2.1.3). In addition, all disturbed areas would be reseeded with appropriate native species following construction activities. For these reasons the Proposed Action is expected to have a ***low*** effect on the scenic ORV.

Installation of a permanent concrete sill and weir structure, fishway and trap, workup structure, mechanical building, restroom, and streambank protection would have a direct, long-term visual effect (see Figure 2-1). The permanent concrete weir structure would span the entire stream and be highly visible; this effect would be similar to the effect of the existing seasonal weir, but would occur year-round with the permanent structure. The permanent screw trap, workup structure, mechanical building, restroom trailer pad, and streambank protection would also be noticeable in the analysis area. These permanent features under the Proposed Action would introduce new hardened features to the Lolo Creek riparian and stream corridor in the analysis area, resulting in visual changes. The severity of these changes is considered ***low-to-moderate*** because the visual and scenic landscape will not be substantially changed when compared to the existing condition with the seasonal weir in place.

Other permanent features such as informational signage and kayaker put-in/take-out areas would be evident in the analysis area and would have ***no effect*** on the visual or scenic landscape.

Overall, the Proposed Action would have a ***low*** effect on visual quality and aesthetics when compared to existing conditions. The gradient of Lolo Creek would not change substantially, and with the exception of the concrete sill and weir structure, there would be relatively no change to the hydrologic scenery present in the analysis area. In addition, because an existing seasonal weir and support facilities have been in operation for approximately 10 years, visual changes in the analysis area would be less pronounced. Permanent modifications under the Proposed Action would not interfere with recreational users' views and the scenic ORVs of the mainstem of Lolo Creek upstream of the Lolo Creek Road/Woodland Bridge and the lower 10 miles of the creek below the proposed weir.

Environmental design features would be incorporated into the Proposed Action to reduce the potential operational effects to the aesthetics and visual resources and the scenic ORVs (Section 2.1.3). For example, all concrete and new structures would be color matched to the natural surroundings per VRM guidelines (BLM 2007). The workup area structure and roof would be brown or tan as determined by the BLM and the concrete sill and weir structure would be tan or gray to match native river rocks and boulders (see Figure 2-1). Rocks would be placed along the concrete sill upstream of the structure to soften the appearance of a straight concrete line.

For the reasons given above, and based on the incorporation of mitigation measures under the Proposed Action, effects of the Proposed Action on visual and aesthetic resources and the scenic ORV would be ***low***.

3.10.2.2 No Action Alternative

Under the No Action Alternative, the existing seasonal facilities would continue to have ***low*** visual and aesthetic effects associated with the Lower Lolo Weir and other existing facilities; these effects could increase as the existing facilities age. No construction or operational effects on visual quality and aesthetics associated with the Proposed Action would occur.

3.11 Cultural Resources

Cultural resources include things and places that demonstrate evidence of human occupation or activity related to history, architecture, archaeology, engineering, and culture. Historic properties, as defined by 36 CFR 800, the implementing regulations of the National Historic Preservation Act (NHPA; 16 USC 470 *et seq.*), are a subset of cultural resources that consists of any district, site, building, structure, artifact,

ruin, object, work of art, or natural feature important in human history that meets defined eligibility criteria for the National Register of Historic Places (NRHP).

The NHPA requires that cultural resources be inventoried and evaluated for eligibility for listing in the NRHP and that federal agencies evaluate and consider effects of their actions on these resources. Cultural resources are evaluated for eligibility in the NRHP using four criteria commonly known as Criterion A, B, C, or D, as identified in 36 CFR Part 60.4 (a–d). These criteria include an examination of the cultural resource's age, integrity (of location, design, setting, materials, workmanship, feeling and association), and significance in American culture, among other things. A cultural resource must meet at least one criterion to be eligible for listing in the NRHP.

Historic properties include prehistoric resources that predate European contact and settlement. The area of potential effects (APE; defined in 36 CFR 800.16(d)), for cultural resources includes areas landward of the OHWM that would be subject to excavation and/or grading within the 2.4-acre ROW associated with the existing Lower Lolo Weir.

Issues addressed in this section include a description of the affected environment and an evaluation of the effects of the alternatives on cultural resources within the APE. Also addressed in this section is information gathered for the required Wild and Scenic River Act Section 7 Analysis as it relates to historic ORVs (*see* Appendix B). Potential effects on the historic ORVs are considered in the analysis presented below.

3.11.1 Affected Environment

Information about cultural resources addressed in this section is based on the Archaeological and Historical Survey Report prepared by the NPT on November 19, 2010 for the *South Fork Clearwater River and Lolo Creek PIT Tag Reader Location Survey*, and the *Lolo Creek Fishing Weir Phase I Cultural Resource Study* prepared by the NPT on July 10, 2012 for this Proposed Action (BPA and NPT 2010; NPT 2012b). The objective of these studies was to identify all cultural and historic properties within the proposed project area, including **Precontact** and historic archaeological sites, historic structures, trails/ roads, and other cultural resources. Background research conducted for the surveys included record searches at the Idaho State Historic Preservation Office (SHPO) on October 1, 2010, and the Nez Perce Tribal Historic Preservation Office; review of previous archaeological and historical studies relevant to the project area; review of relevant maps, aerial photos, and other data sources.

The NPT and BLM conducted field examinations within the APE in May 2012 to investigate the area where disturbance is proposed in the creek bed and along the banks of Lolo Creek and to conduct subsurface investigations. The findings of the field studies were presented in *Lolo Creek Fishing Weir Phase I Cultural Resource Study*, which was submitted by the BLM to the Idaho SHPO for review and concurrence (NPT 2012b). In August 2012, consultation with the SHPO was completed, as described below in Section 3.11.2.1.

3.11.1.1 Review of Cultural Studies and Historic Properties

Nine previous cultural resource studies have been completed in the Lolo Creek area. These surveys were conducted primarily for transportation and other development projects, including the BPA-funded PIT-tag detector installed by the NPT in 2011 at the project site. Generally, historic properties are found along stream and river banks, with a high probability of historic properties on benches, and flat, open areas adjacent to steam banks because of historic resource availability in those locations.

Previous survey information indicates that there are two identified historic properties recorded within 1.0 mile of the project area for the Proposed Action. The sites are Precontact campsites associated with traditional Nez Perce trails. These sites were identified by Steven Shawley in 1977, but the exact location and size of the sites has not been confirmed through archaeological research, nor were they confirmed as part of the previous survey (BPA and NPT 2010). No historic properties or other cultural resources were identified during the previous survey.

A small portion of the Nez Perce trail is located on the south side of Lolo Creek within the APE (see Figure 3-6). This trail is part of a larger trail network leading over Lolo Pass and is considered part of the Nez Perce (Nee-Me-Poo) National Historic Trail, the Lewis and Clark National Historic Trail, and the Lolo Trail (BLM and NPT 2012). No evidence of a trail has been identified on the north side of Lolo Creek (BLM and NPT 2012).

No other cultural resources were identified in the May 2012 field investigations conducted for the Proposed Action (NPT 2012b).

3.11.1.2 Historic Outstandingly Remarkable Values

Historic ORVs are present within the APE. Specifically, Lolo Creek was crossed by the Lewis and Clark Expedition of 1805 and the drainage was commonly used by the Nez Perce Tribe. The Nee-Mee-Poo, or Lolo Trail, crosses Lolo Creek in several locations, and a portion of the Lolo Trail crosses Lolo Creek near the Lolo Creek Road/Woodland Bridge crossing in the project area (BLM 2006).

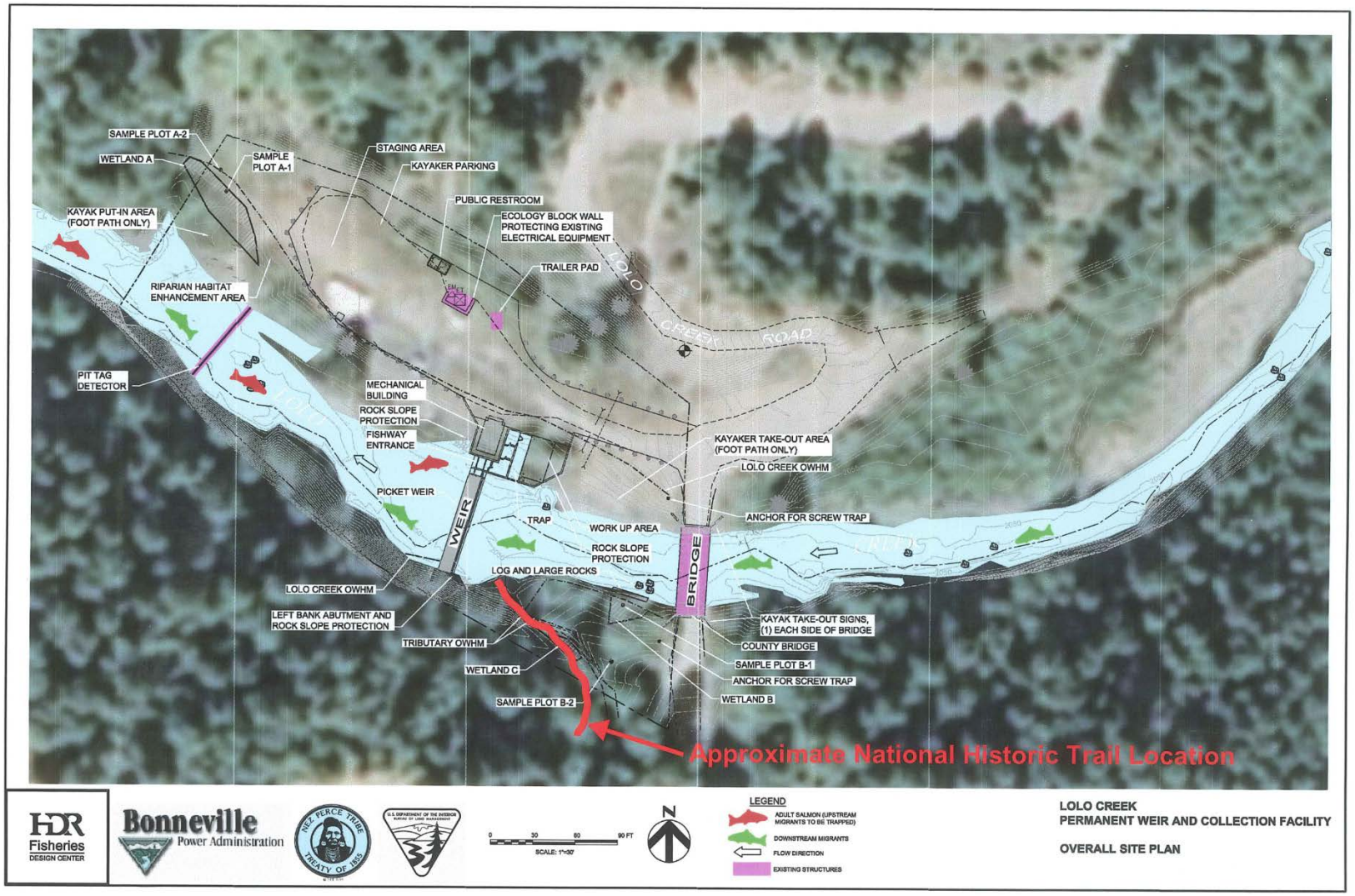

Figure 3-6. National Historic Trails in the Project Area.

3.11.2 Environmental Effects

3.11.2.1 Proposed Action

The Proposed Action is anticipated to have a ***low to moderate*** short-term effect on the historic trail during construction due to visual and auditory intrusion attributed to construction equipment, and noise associated with construction activities at the project site. However, there would be ***no effect*** to cultural resources or historic properties.

The vast majority of construction would take place on the north side of Lolo Creek, and within the creek itself. Construction equipment would use the north side of the creek to access weir construction locations on the south side of Lolo Creek (e.g., south bank weir abutments). No equipment would traverse land along the south bank of Lolo Creek to construct weir components; thus there would be no direct physical impact to the trail. However, an excavator would be used to install the juvenile screw trap anchors on the south bank (in the same footprint as existing ecology blocks). The screw trap anchors would be installed by equipment staged from Lolo Creek Road, or from another previously-disturbed access location immediately adjacent to the road on the south bank. These access locations do not overlap with the historic trail.

The existing weir is, and the proposed weir would be, in the visual sight-line of the trail. The proposed weir has been designed within the BLM's visual resource management guidelines (BLM 1986) to reduce the potential effects to the aesthetics and visual resources (see Section 3.10, Visual Quality). To mitigate the visual impacts on the trail, interpretive signs addressing the value of the Historic Trails are proposed as well as signs describing the fish weir. In addition, the new structures would be color-matched to blend in with the surrounding environment. Therefore the Proposed Action is anticipated to have ***no effect*** to the historic trail (BLM and NPT 2012).

The Proposed Action is not anticipated to result in adverse effects to cultural resources or the historic ORVs located at Lolo Creek. As such, the Proposed Action is expected to have ***no effect*** on cultural resources. In August 2012, the BLM initiated consultation with the Idaho SHPO regarding the Proposed Action, pursuant to Section 106 of the National Historic Preservation Act. On August 21, 2012, the SHPO concurred with BLM's determination that the project would result in ***no effect*** to historic properties.

If any unanticipated archaeological and historic resources are identified at the project site during construction of the Proposed Action, the protocol recommended in the NTP Lolo Creek Fishing Weir Phase I Cultural Resource Study, and described in Section 2.1.3, would be followed to ensure compliance with the National Historic Preservation Act.

3.11.2.2 No Action Alternative

There would be ***no effects*** on cultural resources or the historic ORVs under the No Action Alternative because there would be no new ground disturbance associated with the ongoing activities taking place at the seasonal fish weir facility.

3.12 Cumulative Effects

3.12.1 Introduction

As defined by NEPA regulations (40 Code of Federal Regulations [CFR] 1508.7), cumulative effects result from the incremental effects of the Proposed 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. For purposes of this analysis, past, present, and reasonably foreseeable future actions are defined as follows:

- Past Actions include activities that were associated with past actions and may involve present operations.

- Present Actions include activities that may just have been completed, are currently under way, or are planned for the near future.
- Reasonably Foreseeable Future Actions include private or public projects already funded, permitted, or under regulatory review, or included in an approved final planning document. For this project, BPA defined "reasonably foreseeable" as projects with a reasonable expectation of occurring during the operating life of the proposed facility.

The following projects or programs make up the Past, Present and Reasonably Foreseeable Future Actions in the Lolo Creek analysis areas:

Past Actions:

- Private development (e.g., homes, vacation properties),
- Restoration actions in the upper Lolo Creek Watershed to increase habitat quality, quantity, and connectivity as implemented by the NPT Watershed Division,
- Suction dredging and placer mining in the upper watershed,
- Timber harvest and grazing,
- Construction of logging roads in the Lolo Creek Watershed, and decommissioning of roads to reduce erosion and chronic sedimentation,
- Replacement of culverts and bridges in Lolo Creek Watershed to increase access to spawning and rearing habitat,
- Planting of riparian vegetation in the Lolo Creek Watershed to increase shade and reduce stream temperatures,
- Removal of invasive plant species in the Lolo Creek Watershed to enhance native plant growth, and
- Enclosing riparian areas to prevent damage due to livestock grazing in the riparian corridor and along streambanks.

Present Actions:

- Recreational use at the IDL parcel upstream,
- Recreational use of Lolo Creek,
- Lamprey and spring Chinook supplementation by NPT,
- NPT operation of seasonal Lower Lolo Weir,
- Habitat restoration of the watershed by NPT,
- Installation of PIT-tag detectors in Lolo Creek (upstream and downstream of existing weir) by the NPT to monitor movement of anadromous fish.
- Implementation of recently completed *Lolo Creek Tributaries Subbasin Assessment Total Maximum Daily Load (TMDL)* (IDEQ 2011) for upstream tributaries including Eldorado Creek, Jim Brown Creek, and Musselshell Creek
- Suction dredging in the CNF,
- Timber harvest, and
- County road maintenance and use.

Reasonably Foreseeable Future Actions:

- Management actions as part of the Cottonwood RMP,
- Acquisitions of adjacent or nearby lands by BLM (e.g., acquisition of private parcel adjacent to existing Lower Lolo Weir),
- Proposed land exchange with private timber company by BLM for parcels adjacent to Lolo Creek,
- Proposed land interchange of scattered land parcels on Lolo Creek from U.S. Forest Service to BLM,
- Upstream suction dredging authorized on U.S. Forest Service lands, and

- Instream and riparian habitat improvement project- upstream and downstream throughout the Lolo Creek corridor.
- Ongoing and future actions on State and private land that are reasonably certain to occur in the watershed include:
  - Continued protection from grazing in the form of fencing along the banks of Lolo Creek,
  - Dredging near the mouth of Lolo Creek,
  - Instream habitat enhancements in the form of large woody debris and deflector jam,
  - Ongoing anadromous fish stocking and collection (weir) operations,
  - Managed timber harvest,
  - Recreation/tourism, including recreational harvest of fish,
  - Limited road construction, maintenance and use.
- Federal actions, including on-going recreational dredging and mining in the CNF, and instream activities (i.e., local bridge work) that require authorization from the USACE.

Cumulative effects can be positive as well as negative depending on the resource being evaluated. Overall, the Proposed Action is expected to have a ***low to moderate*** contribution to cumulative effects on some of the resources evaluated in this EA. Cumulative effects to each resource resulting from the Proposed Action are described below.

3.12.2 Aquatic Habitat and Special Status Species

The area considered for cumulative effects to aquatic habitat and special status species includes the Lolo Creek drainage. The entire drainage was selected for analysis because aquatic species that utilize habitat in the watershed would be delayed during upstream and downstream movement past the project area. Activities outside of the drainage would not directly or indirectly affect individual fish or habitat, and therefore would not contribute to cumulative effects.

3.12.2.1 Aquatic Habitat

The BLM has a draft proposal for timber harvest on 45 acres on the south side of Lolo Creek (BLM Proposed Double Lo Timber Sale), upstream, and upslope from the project area (Culver 2011). However, no timber harvest would occur within 300 feet of Lolo Creek or within 150 feet of small perennial non-fish bearing tributaries. Timber harvest activities would result in short term increases in erosion/sediment; however, measurable amounts reaching Lolo Creek would be expected to be low or immeasurable. Because no harvest would occur within the 300 feet Riparian Conservation Area of Lolo Creek, loss of streambank stability or LWD recruitment is unlikely. There would be no direct or indirect effects to bank stability or LWD due to implementation of the Proposed Action. Thus, ***no*** cumulative effects to streambank stability or LWD recruitment are expected.

Upstream suction dredging in the CNF combined with the loss of potentially suitable spawning gravel in the project footprint, may cumulatively affect salmonid spawning gravel. However, suction dredging only temporarily disturbs, removes, or rearranges spawning gravels, and the effects are expected to be minimal since dredging activities would avoid most spawning gravels (USFS 2009). The Biological Opinion for 2009 and 2010 Lolo Creek Suction Dredging stated there would be no anticipated potential for cumulative effects from many years of small-scale suction dredge operations (USFS 2009; NMFS 2009b). Considering the minor amount of suitable spawning gravels in the weir footprint (5 percent or less) and the low impact the Proposed Action would have on available spawning habitat, the cumulative effect to salmonid spawning habitat in the Lolo Creek drainage is ***low***.

Because of the implementation of the environmental design features/mitigation measures described in Section 2.1.3, the Proposed Action would result in a ***low*** contribution to cumulative effects on aquatic habitat.

3.12.2.2 Aquatic Species

Construction activities and resultant effects would only occur during the single August 1 – October 31 instream work period established for the Proposed Action. BPA is not aware of any other instream projects that would occur in the immediate vicinity of the Proposed Action during the construction period (2013 at the time of this writing); however, other permitted actions that would occur in the Lolo Creek drainage including suction dredging, culvert and road maintenance, and timber harvest. Considered with the Proposed Action, these actions could contribute to localized increases in suspended sediment and a reduction of instream shading due to vegetation removal, though effects would be ***low*** across the drainage.

The types of foreseeable future instream actions, including upstream suction dredging on USFS-managed lands, culvert decommissioning, or maintenance and timber harvest, would not likely result in permanent loss of instream habitat; the Proposed Action is not anticipated to result in a substantial loss of instream resources when considered with these projects since there is ample, underutilized habitat available for special status fish species in the drainage. Thus, the Proposed Action will have ***no*** cumulative impact on instream habitat.

Additional displacement and potential injury to aquatic species could occur due to instream suction dredging authorized by the USFS on reaches in the CNF upstream of the project area. The dredging period is 45 days, so during these times, aquatic species that move through the project area could experience migratory delays at the weir and also be subject to additional stressors upstream at dredging locations. Due to the potential for delays and displacement at instream work sites, the Proposed Action would have a ***low*** cumulative impact on aquatic species during the instream suction dredging period.

In summary, potential cumulative effects to aquatic resources are possible due to the Proposed Action in consideration of other on-going activities in the Lolo Creek drainage. These effects would primarily take the form of migratory delay, and minor modifications to stream margin habitat during weir operations. Upstream recreational fishing and suction dredging likely result in similar effects. The loss of up to three mature conifers should result in negligible effects to instream shading.

In summary, ongoing instream activities, including recreational suction dredging, fishing and fish-monitoring actions, and habitat restoration have all affected aquatic habitat and species within and surrounding the analysis area. Ongoing and extended weir operations associated with the Proposed Action would continue to affect aquatic resources in the project vicinity.

The project would result in short-term effects to aquatic resources from construction, and effects to species during operation. However, with implementation of the environmental design features/mitigation measures described in Section 2.1.3, the Proposed Action, in consideration of all other actions in the basin (including ongoing operation of the existing seasonal weir), would result in a ***low to moderate*** contribution to cumulative effects to aquatic species and habitat.

3.12.3 Water Resources

The geographic area considered for cumulative effects on water resources includes the segment of Lolo Creek 640 feet upstream and 1000 feet downstream of the new weir. Several instream structures occur in the analysis area for water resources. These include abutments for the existing Lolo Creek Road/Woodland Bridge and the existing NPT PIT-tag array system installed along the streambed downstream of the proposed permanent weir. These structures, considered cumulatively with the Proposed Action as well as reasonably foreseeable future actions, would affect local hydraulics in the immediate vicinity of structures. However, these effects are considered to be ***low*** in the analysis area because the free-flowing nature of Lolo Creek would be maintained. The Proposed Action is anticipated to have a ***low*** cumulative effect on water resources, in addition to those discussed above for aquatic habitat.

3.12.4 Vegetation and Wetlands

The geographic area considered for cumulative effects to vegetation and wetlands includes the Project footprint and 640 feet upstream and downstream from project, riparian areas and Riparian Conservation Area (i.e., within 300 feet of Lolo Creek). The past, present and reasonably foreseeable future activities that can be expected to cumulatively affect vegetation and wetlands in the geographic area are planting of riparian vegetation and removal of invasive plant species in the Lolo Creek Watershed, on-going operation of the NPT weir and land-based structures on the north-bank, recreational use of Lolo Creek, management actions as part of the Cottonwood RMP, and instream and riparian habitat improvement projects upstream and downstream throughout the Lolo Creek corridor. BLM-authorized timber harvest activities are outside of the geographic area considered for cumulative effects to vegetation and wetlands.

The effects of vegetation removal of the Proposed Action, considered cumulatively with the planting of riparian vegetation, invasive species removal, and other management activities described above, would modify local vegetation in the immediate vicinity of the proposed project. Environmental design features/mitigation measures descried in Section 2.1.3 would ensure that cumulative effects of the Proposed Action to vegetation and wetlands would be ***low***.

3.12.5 Terrestrial Wildlife Habitat and Special Status Species

The geographic area considered for cumulative effects to terrestrial wildlife habitat and special status species includes the analysis area defined in Section 3.6. The past, present and reasonably foreseeable future actions that can be expected to cumulatively affect terrestrial wildlife habitat and special status species in the geographic area are recreational use of Lolo Creek, planting of riparian vegetation and removal of invasive plant species in the Lolo Creek Watershed, and management actions as part of the Cottonwood RMP.

The Proposed Action's effects to terrestrial wildlife and special status species (temporary noise and habitat disturbance, and increased human disturbance), considered cumulatively with the past, present and reasonably foreseeable future actions, may result in localized habitat disturbance and increased human activity in the immediate vicinity of the proposed structures. Environmental design features/mitigation measures descried in Section 2.1.3 would ensure that cumulative effects of the Proposed Action to terrestrial wildlife habitat and special status species would be ***low***.

3.12.6 Special Designations - Area of Critical Environmental Concern and Wild and Scenic Rivers

Environmental elements for which the Upper Lolo Creek ACEC was designated include scenic values, cultural resources, ecological resources and special status fish, wildlife and plants. Cumulative effects associated with the Proposed Action on each of those resources are discussed in Section 3.12.2, Aquatic Habitat and Special Status Species; Section 3.12.3, Water Resources; Section 3.12.4, Vegetation and Wetlands; Section 3.12.5, Terrestrial Wildlife Habitat and Special Status Species, 3.12.9, Visual Quality and Aesthetics; and Section 3.12.10, Cultural Resources. The Proposed Action would result in a ***low*** cumulative effect on ACEC-related resources in Upper Lolo Creek.

With regard to the preliminary suitability determination of Lolo Creek under the NWSRS, the project would result in ***low to moderate*** direct effects on scenic, recreation, historic and fisheries-related ORVs in the preliminarily suitable 27.19-mile Lolo Creek segment. However, considering the presence of the existing weir and related facilities on-site, the Proposed Action's contribution to cumulative effects on the scenic ORV would be ***low***. The recreational ORV would be directly affected, primarily as related to boating during the high flow season. Given the mitigation measures proposed and the limited instream barriers that are present, cumulative effects to this ORV are anticipated to be ***low***. Cumulative effects to fish and historic ORVs are discussed in Sections 3.12.2 and 3.12.10, respectively. The Proposed Action would result in a ***low*** contribution to cumulative effects to Lolo Creek ORVs, including fish (Section 3.12.2), recreation (Section 3.12.7), scenic (Section 3.12.9), and historic (Section 3.12.10). Also, due to

the flow-through nature of the proposed weir and the fact that streambank facilities would not dam the creek, the project would not contribute to cumulative effects on the free-flowing nature of Lolo Creek.

3.12.7 Recreation

The geographic area considered for cumulative effects on recreation includes the Lolo Creek drainage. The past, present and reasonably foreseeable future actions that can be expected to cumulatively affect recreation in the geographic area are recreational use of the IDL parcel upstream, and recreational use of Lolo Creek, including recreation/tourism activities.

In addition, the project area is within a designated SRMA. As stated in the Cottonwood RMP, the BLM intends to develop an activity plan for management of the Lolo Creek SRMA. A key action of the SRMA is to manage the area as an undeveloped recreation-tourism market for residents and visitors. Measures contained in the activity plan would help manage present and future activities in the geographic area for recreation use.

The Proposed Action would cumulatively affect recreation through disruption to instream recreation use and access. However, environmental design features/mitigation measures described in Section 2.1.3 would ensure that cumulative effects of the Proposed Action on recreation would be ***low***.

3.12.8 Transportation

The geographic area considered for cumulative effects on transportation includes a three-mile radius from the project area. The past, present and reasonably foreseeable future actions that can be expected to cumulatively affect transportation in the geographic area are road maintenance and use, and limited road construction.

The Proposed Action would contribute to cumulative impacts on transportation during operation and maintenance of the weir and other facilities. The implementation of environmental design features and mitigation measures described in Section 2.1.3 would ensure that the incremental contribution of the Proposed Action to cumulative effects on transportation would be ***low***.

3.12.9 Visual Quality and Aesthetics

The geographic area considered for cumulative effects on visual quality and aesthetics is the Lolo Creek SRMA. The past, present and reasonably foreseeable future actions that can be expected to cumulatively affect visual quality and aesthetics in the geographic area are managed timber harvests and limited road construction, maintenance, and use.

The Proposed Action would contribute to cumulative effects on visual quality and aesthetics through the permanent changes to the visual landscape. The geographic area includes the viewshed along the mainstem of Lolo Creek. This viewshed is included in the Lolo Creek SRMA, which is managed under the BLM's Cottonwood RMP. A key action item of the recreation resource of the Cottonwood RMP is to maintain all recreation facilities and recreation use areas for public safety and aesthetics. Measures contained in the Cottonwood RMP would help manage present and future activities in the geographic area for visual and aesthetic resources. For these reasons, as well as the implementation of environmental design features/mitigation measures described in Section 2.1.3, the contribution to cumulative effects on visual quality and aesthetics would be ***low***.

3.12.10 Cultural Resources

Cultural resources in the Lolo Creek Watershed have likely been cumulatively affected by past, present, and current development activities, such as timber harvest, road development, and residential development near historic trails. No archaeological resources have been identified in the analysis area; thus the Proposed Action is anticipated to have ***no effect*** on archaeological resources. The Proposed Action is not anticipated to result in any long-term effect on the Nez Perce National Historic Trail; thus

the Proposed Action would have ***no effect*** on historic resources (see Section 3.11.2.1). For these reasons, the Proposed Action would not contribute to cumulative impacts to cultural resources.

3.13 Mitigation and Monitoring

As a result of the analysis in this chapter, no mitigation and monitoring measures beyond those described for the Proposed Action alternative (Section 2.1.3) are recommended.

Chapter 4 Environmental Consultation, Review, and Permit Requirements

4.1 Relationship to Laws, Policies, and Land Use Plans

This chapter addresses statutes, implementing regulations, and executive orders applicable to the Proposed Action. This EA is being sent to individuals, tribes, Federal agencies, state agencies, and local governments as part of the consultation process for the Proposed Action (see Chapter 5 for the EA distribution list).

4.1.1 National Environmental Policy Act

This EA was prepared pursuant to regulations implementing NEPA (42 USC 4321 et seq.), which requires Federal agencies to assess the impacts that their actions may have on the environment. NEPA requires preparation of an EIS for major federal actions significantly affecting the quality of the human environment. BPA prepared this Preliminary EA to determine if the Proposed Action would create any significant environmental impacts that would warrant preparing an EIS, or if a FONSI is justified. The BLM cooperated in preparation of this EA due to its jurisdiction by law (40 CFR 1501.6) under the Federal Land Policy and Management Act for amending the existing right-of-way grant for the construction and operation of the permanent weir and fish trapping facilities.

4.1.2 Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701 *et seq*.) recognized the value of our Nation's public lands and provided a framework in which they could be managed in perpetuity for the benefit of present and future generations. BLM land use planning requirements are established by Sections 201 and 202 of FLPMA and regulations found at 43 CFR 1601. Land use plans and planning decisions are the basis for every on-the-ground action the BLM undertakes. Land use plans include approved resource management plans, and ensure that the public lands are managed in accordance with the intent of Congress as stated in FLPMA under the principles of multiple use and sustained yield. As required by FLPMA and BLM policy, the public lands must be managed in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archaeological values and where appropriate, will preserve and protect public lands in their natural condition; provide food and habitat for fish and wildlife and domestic animals, provide for outdoor recreation and human occupancy and use; and that recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands by encouraging collaboration and public participation throughout the planning process. As described in this EA, the Proposed Action conforms to the 2009 *Record of Decision and Approved Cottonwood Resource Management Plan* (RMP) (BLM 2009). For a detailed summary of the relevant RMP policies and actions and where the EA addresses them, refer to Appendix D.

Congress mandated the designation of Areas of Critical Environmental Concern (ACECs). ACEC designations made in land use plans must meet the relevance and importance criteria in 43 CFR 1610.7-2(a) and must require special management to protect the area and prevent irreparable damage to resources or natural systems (43 CFR 1601.0-5(a)). The Upper Lolo Creek and Lower Lolo Creek ACECs are designated by the Cottonwood RMP to protect and conserve scenic values, cultural resources, ecological resources and special status fish, wildlife, and plants (BLM 2009; See Special Designations Section 3.7, Recreation Section 3.8, and Appendix B for the Wild and Scenic River Section 7 Analysis).

The Visual Resource Management (VRM) System for BLM (Manual 8400) is also established under the FLPMA. By law, the BLM is responsible for managing these public lands for multiple uses. BLM is also responsible for ensuring that the scenic values of these public lands are considered before allowing uses

that may have negative visual impacts. BLM accomplishes this through its VRM system, a system which involves inventorying scenic values and establishing management objectives for those values through the resource management planning process, and then evaluating proposed activities to determine whether they conform to the management objectives. The Proposed Action would adhere to BLM VRM guidelines and color schemes for concrete and new buildings. See Visual Quality and Aesthetics Section 3.10.

4.1.3 Americans with Americans with Disabilities Act

The Americans with Disabilities Act (ADA) of 1990 (42 USC 12101 *et seq*.) established protections against discrimination based on disability. Title III of the ADA requires that new construction or modifications of public accommodations (such as recreation areas) must be designed to comply with ADA Accessibility Guidelines. The Proposed Action (vault toilet) would be designed to comply with ADA design guidelines.

4.1.4 Fish and Wildlife

4.1.4.1 Endangered Species Act

The ESA (16 USC 1531 *et seq.*) establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, and the preservation of the ecosystems on which they depend. The ESA is administered by USFWS for terrestrial species and some freshwater fish species, and by 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 critical habitat. Section 7(c) of the ESA and other federal regulations require that Federal agencies prepare a biological assessment (BA) addressing the potential effects of their actions on listed or proposed endangered species and critical habitats.

The BLM and BPA reviewed the USFWS lists of wildlife and plant species in Clearwater and Idaho counties that are protected under the ESA (USFWS 2011) to determine which endangered or threatened species and critical habitat occur in the project area as defined in Sections 3.3, Aquatic Habitat and Special Status Species, 3.5, Vegetation and Wetlands and 3.6, Terrestrial Wildlife Habitat and Special Status Species of this EA. Because suitable habitat is not present in the project area, the BLM and BPA determined the Proposed Action would have no effect on ESA-listed plant species, MacFarlane's four-o'clock, Spalding's catchfly or their critical habitat and will not impact the candidate species, whitebark pine. In addition, the Proposed Action would have no effect on Canada lynx, northern Idaho ground squirrel, or gray wolf, and would not impact the candidate species, wolverine and yellow-billed cuckoo.

Relative to ESA-listed fish, basin-wide maps were reviewed to determine which listed fish stocks under NMFS and USFWS jurisdiction occur in the project area. Based on the USFWS lists, reconnaissance-level surveys, and discussions with USFWS, NMFS, IDFG and the NPT, the agencies determined two species had the potential to occur and be affected by the Proposed Action: Snake River steelhead (and steelhead critical habitat), and bull trout. BLM and BPA entered into pre-consultation with the NMFS and USFWS (Services) regarding potential effects on these species and critical habitat in March 2012.

Pursuant to the requirements of Section 7(c) of the ESA, the BLM and BPA jointly prepared a BA. The BLM desired to initiate consultation as the federal land-manager, and submitted a draft BA to the Services in February 2012. Several drafts of the BA were reviewed by the Services and the BLM submitted the final BA to the Services in August 2012, with a request to enter into formal consultation. The BA addresses effects of operation and construction of the Proposed Action on Snake River steelhead and bull trout. The BLM and BPA determined the Proposed Action would be likely to adversely affect both steelhead and bull trout, as well as Snake River steelhead critical habitat. Upon completion of the ESA consultation process with the USFWS and NMFS, the Proposed Action would comply with all terms and conditions of the take authorizations issued by USFWS for bull trout, and by NMFS for steelhead and its designated critical habitat. The potential effects of the Proposed Action on steelhead, bull trout and

steelhead critical habitat are discussed in greater detail in Section 3.3, Aquatic Habitat and Special Status Species.

Upon completion of the new weir, effects to bull trout associated with handling of fish at the structure would be covered under an existing federal permit issued to the NPT for research in the Clearwater Basin (Permit No. TE001598-4). The NPT currently holds an ESA Section 10 Scientific Research Permit authorizing the take of Snake River steelhead associated with operation of NPT steelhead and spring/summer Chinook weirs in the Clearwater Basin, including Lolo Creek (Permit No. 1339-3R). This authorization would cover handling, holding, and harassment of Snake River steelhead at the proposed weir.

4.1.4.2 Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 *et seq.*) encourages Federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats. The Fish and Wildlife Coordination Act (16 USC 661 *et seq.*) requires Federal agencies with projects affecting water resources to consult with USFWS and the state agency responsible for fish and wildlife resources.

BPA is consulting with the USFWS regarding potential effects of the Proposed Action on fish and wildlife species and will implement the measures listed in this document and any other measures required by USFWS. BPA also coordinated with the Idaho Department of Fish and Game on the proposed instream work window and species presence in the project area. The Proposed Action would have ***low*** to ***moderate*** impacts on fish and wildlife (see Sections 3.3, Aquatic Habitat and Special Status Species and Section 3.6, Terrestrial Wildlife Habitat and Special Status Species), with implementation of appropriate mitigation.

4.1.4.3 PACFISH - Cottonwood RMP Aquatic and Riparian Management Strategy

In accord with *A Framework for Incorporating the Aquatic and Riparian Component of the Interior Columbia Basin Strategy into BLM and Forest Service Plan Revisions* (U.S. Forest Service et al. 2004); the BLM Cottonwood RMP, Aquatic and Riparian Habitat Management Strategy (BLM 2009) provides a level of conservation, restoration, protection and special management for the primary constituent elements essential to the conservation of ESA-listed fish. With the completion of the RMP, this strategy replaced PACFISH, which was an interim strategy pending amendment of land use plans (BLM and USFS 1995). Although instream construction associated with the Proposed Action would result in temporary degradation of aquatic habitats, the Proposed Action, upon completion, would comply with the Cottonwood RMP's Aquatic and Riparian Habitat Strategy (BLM 2009; see Appendix D). For more details, see, Section 3.3, Aquatic Habitat and Special Status Species and Appendix B, Wild and Scenic River Section 7 Analysis.

4.1.4.4 Magnuson-Stevens Fishery Conservation and Management

NMFS is responsible for ensuring compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (Magnuson-Stevens Act) (16 USC 1801 *et seq.*). Under Section 305(b) (4) of the Act, BPA/BLM are required to consult with NMFS for actions that adversely affect **Essential Fish Habitat** (EFH); in turn, NMFS is required to provide EFH conservation and enhancement recommendations.

EFH for Chinook and coho is present within the project area and the Proposed Action may adversely affect EFH for Chinook salmon and coho salmon. Although historic EFH for coho salmon is present in the study area, coho are not currently known to occupy Lolo Creek. However, coho EFH was included in the EFH assessment in the BA submitted to the Services in August 2012.

4.1.4.5 Migratory Bird Treaty Act and Federal Memorandum of Understanding

The Migratory Bird Treaty Act, as amended, implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 USC 703–712). Under the Act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. The Act classifies most species of birds as migratory, except for upland and non-native birds such as pheasant, chukar, gray partridge, house sparrow, European starling, and rock dove.

BPA (through DOE) and USFWS have a memorandum of understanding (MOU) to address migratory bird conservation in accordance with Executive Order (EO) 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), which directs each federal agency that is taking actions possibly negatively affecting migratory bird populations to work with the USFWS to develop an agreement to conserve those birds (DOE and USFWS 2006). The MOU addresses how both agencies can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

The Proposed Action would result in a loss of up to three mature conifers from the riparian corridor, and several immature alder. However, willows and cedars would be planted along the north bank. As such, the Proposed Action would likely not affect migratory birds through loss of habitat and would attempt to avoid ground disturbing activities during the spring nesting season. In the event that potential effects on nesting populations cannot be avoided, BPA would work with USFWS to determine appropriate mitigation measures.

4.1.4.6 Bald Eagle and Golden Eagle Protection Act

The Bald Eagle and Golden Eagle Protection Act prohibits the taking or possessing of and commerce in bald and golden eagles, with limited exceptions (16 USC. 668–668d). The Act covers only intentional acts, or acts in "wanton disregard" of the safety of bald or golden eagles. Bald and golden eagles may occasionally forage or roost in the project area, though they are not known to nest. Mitigation measures to avoid and minimize impacts to wildlife species, including eagles, are identified in Section 2.1.3.

4.1.5 Water Resources

4.1.5.1 Clean Water Act

The Clean Water Act (33 U.S.C. 1251 *et seq.*) regulates discharges into waters of the United States. The various sections that would be potentially applicable to the Proposed Action include Sections 401, 402, and 404.

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

Section 402. This section authorizes National Pollutant Discharge Elimination System permits for the discharge of pollutants, such as stormwater. The U.S. Environmental Protection Agency (EPA), Region 10, has a general permit for federal facilities for discharges from construction activities. The Contractor for construction would issue a Notice of Intent to obtain coverage under this general permit, and would prepare a Stormwater Pollution Prevention Plan to address structural practices, stormwater management, and other controls.

Section 404. Authorization from the USACE is required in accordance with the provisions of Section 404 of the Clean Water Act when dredged or fill material is discharged into waters of the U.S. including

wetlands. The NPT has coordinated with the USACE and submitted an application in March 2012 to obtain a Section 404 permit for any fill placed in wetlands and in Lolo Creek. The USACE will coordinate with IDEQ to obtain Section 401 water quality certification, if an individual certification is required. Potential impacts on wetlands are described in Section 3.5 Vegetation and Wetlands, of this EA.

4.1.5.2 Wetlands and Floodplain Protection

The DOE NEPA regulations require that impacts on floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12) and Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands).

An evaluation of impacts of the Proposed Action on wetlands and floodplains is discussed in Section 3.5 Vegetation and Wetlands, of this EA. Impacts to floodplains are described in Section 3.4, Water Resources, and in greater detail in Appendix B, Wild and Scenic River Section 7 Analysis.

4.1.6 Lacey Act and Plant Protection Act

The Lacey Act as amended (16 USC 3371-3378) and the Plant Protection Act of 2000 (7 USC 7701); and EO 13112, Invasive Species, February 3, 1999 establish protections for native plant species. Construction activities for the Proposed Action along the north bank would occur in an area dominated by invasive reed canary grass. Patches of this invasive grass would be removed during construction and native shrubs (willows) would be planted in disturbed areas now occupied by the species (See Vegetation and Wetlands, Section 3.5).

4.1.7 National Wild and Scenic Rivers System

National Wild and Scenic Rivers System was created by Congress in 1968 as part of the Wild and Scenic Rivers Act (16 USC 1271 *et seq*.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The BLM has determined Lolo Creek to be preliminarily suitable for designation under the NWSRS. Consistent with the goals and objectives for a planning area, the BLM assesses eligible river segments and determines which are suitable or non-suitable per Section 5(d)(1) of the Wild and Scenic Rivers Act of 1968. Lolo Creek is managed by the Cottonwood Field Office to protect its Outstandingly Remarkable Values (BLM 2009). A Wild and Scenic River Analysis for the Proposed Action, pursuant to Section 7 of the Wild and Scenic Rivers Act has been prepared (see Appendix B; Water Resources, Section 3.4; Special Designations, Section 3.7., and Recreation, Section 3.8).

4.1.8 Cultural and Historical Resources

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

- Antiquities Act of 1906 (16 USC 431–433),
- Historic Sites Act of 1935 (16 USC 461–467),
- National Historic Preservation Act (NHPA) of 1966, (16 USC 470 et seq.), as amended, inclusive of Section 106,
- Archaeological Data Preservation Act of 1974 (16 USC 469 a-c),
- Archaeological Resources Protection Act of 1979 (16 USC 470 aa-mm), as amended,
- Native American Graves Protection and Repatriation Act (25 USC 3001 et seq.),
- Executive Order 13007 Indian Sacred Sites,

- Executive Order 13175, Consultation and Coordination with Tribal Governments, and
- American Indian Religious Freedom Act of 1978 (42 USC 1996, 1996a).

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

Executive Order 13175 (Section 2(b), November 6, 2000) recognizes the rights of tribes working on a government-to-government basis to address issues concerning tribal trust resources, treaty, and other rights. To this end, BPA and BLM have provided information about the Proposed Action to and requested input on the level and type of proposed identification and evaluation efforts of the prehistoric and historic resources of traditional and cultural importance from the Idaho State Historic Preservation Office (SHPO) and the Nez Perce Tribe. In August 2012, the BLM initiated consultation with the Idaho SHPO regarding the Proposed Action, pursuant to Section 106 of the NHPA. On August 21, 2012, the SHPO concurred with BLM's determination that the project would result in ***no effect*** to historic properties (BLM 2012b).

4.1.9 Noise and Public Health and Safety

The Federal Noise Control Act of 1972 (42 USC 4901 *et seq.*) sets forth a broad goal of protecting all people from noise that jeopardizes their health or welfare. The Act further states that Federal agencies are authorized and directed, to the fullest extent consistent with their authority under Federal laws administered by them, to carry out the programs within their control in such a manner as to further this policy. The project is situated on federal land managed by the BLM and no activities are proposed that would have a permanent effect on noise. Noise effects from construction activities would be temporary, ***low***, and limited to localized areas. Idaho has no established state-wide regulations limiting noise emissions from commercial facilities. Local jurisdictions in the vicinity, including Clearwater and Idaho Counties, have prescriptive noise standards contained within their local permitting requirements, but a local permit is not required for the Proposed Action because construction would occur only on BLM-managed lands.

4.1.10 Executive Order on Environmental Justice

In February 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was released to federal agencies. This order states that federal agencies shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The Proposed Action would not cause disproportionately high and adverse impacts on minority and low-income populations because all populations in the Lolo Creek project area would be affected similarly.

4.1.11 Air Quality

The federal Clean Air Act, as amended (42 USC 7401 *et seq.*), requires the EPA and individual states to carry out a wide range of regulatory programs intended to assure attainment of the National Ambient Air Quality Standards (NAAQS). In Idaho, both the EPA and IDEQ have responsibility for air quality. Because the Proposed Action would occur in an area that is currently in attainment for meeting the NAAQS and because no stationary sources of air emissions would occur, construction activities associated with the Proposed Action are exempted for state regulation. Air quality impacts from weir construction and operation are expected to be ***low*** because they would be temporary and occur only during construction. Further, temporary impacts would be minimized by the use of dust abatement measures (e.g., watering trucks), and idling restrictions would be implemented during construction.

4.1.12 Climate Change

Gases that absorb infrared radiation and prevent heat loss to space are called greenhouse gases (GHGs). They are released both naturally and through human activities such as deforestation, soil disturbance, and burning of fossil fuels. The principal GHGs emitted into the atmosphere through human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases (EPA 2010a, b).

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

- The Clean Air Act is a federal law that establishes regulations to control emissions from large generation sources such as power plants; limited regulation of GHG emissions occurs through the New Source Review permitting program.
- The EPA has issued the *Final Mandatory Reporting of Greenhouse Gases Rule* that requires reporting of GHG emissions from large sources. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to the EPA (EPA 2010b), although no other action is required (40 CFR 98).
- Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.

GHG emissions associated with the Proposed Action include:

- **construction**: emissions produced through the removal and/or disturbance of natural vegetation and soils;
- **construction**: use of gasoline and diesel powered vehicles, including cars, trucks, and construction equipment; and
- **operation and maintenance**: use of gasoline and diesel powered vehicles for employee commuting, and transport of broodstock to the NPTH.

Under the Proposed Action, it is estimated that approximately 600 truck trips would occur over the 8-month construction period. During operations, including the 5-month spring Chinook broodstock collection period (May – September), 1-2 fish haul truck trips per day are anticipated for a total of 150-300 truck trips per year. For these reasons, GHG emissions are anticipated to be well below EPA's mandatory reporting threshold, which is 25,000 metric tons of **carbon dioxide equivalent**, roughly the amount of CO2 generated by 4,400 passenger vehicles per year. Following initial construction, the impact of the Proposed Action on GHG concentrations would be **low**, and similar to existing conditions.

4.1.13 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 USC 4201 *et seq.*) directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The Act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses. No farmlands are present in the vicinity of the Proposed Action, and therefore none would be affected by the Proposed Action.

4.1.14 Hazardous Materials

Several Federal laws related to hazardous materials potentially apply to the Proposed Action. Small amounts of hazardous waste may be generated by the Proposed Action. Typical construction and maintenance activities may generate small amounts of hazardous materials including solvents, pesticides, paint products, motor and lubricating oils, and cleaners.

The Spill Prevention Control and Countermeasures Rule

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

Comprehensive Environmental Response, Compensation, and Liability Act, as Amended

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

Uniform Fire Code

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

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act, as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of hazardous waste, and on owners and operators of treatment, storage, and disposal facilities (42 USC 6901 *et seq.*). Each facility owner or operator is required to have a permit issued by EPA or the state. Hazardous waste generated by the Proposed Action, if any, would be disposed of according to applicable laws, including the Resource Conservation and Recovery Act.

4.1.15 State

Proposed construction in Lolo Creek would require a permit from the IDWR in compliance with the Idaho Stream Channel Protection Act (Title 42, Chapter 38, *et seq.* Idaho Code). The NPT submitted an application to IDWR in March 2012; a stream alteration permit was issued to the NPT on June 7, 2012.

The Proposed Action would not directly affect land managed by the Idaho Department of Lands (IDL) immediately upstream from the existing temporary fish weir site.

4.1.16 Local

The Proposed Action is a continuation of an existing land use permitted by the BLM and implementation of the Proposed Action is unlikely to affect existing land uses in the project area. The project area is defined as the existing NPT ROW at the site. Because the project site occurs on federal lands managed by the BLM, local permits or approvals are not required for proposed activities. However, the placement of boater warning signage on the Lolo Creek Road/Woodland Bridge requires coordination with the Clearwater Highway District and Idaho County, as co-owners of the bridge. Both entities have agreed to allow such signage (Gangewer 2012; Meinen 2012).

Chapter 5
EA Distribution and Preparers List

5.1 Distribution

The project mailing list contains the agencies, tribes, groups, or individuals listed below. They have directly received or have been given instructions on how to receive all project information made available and will have the opportunity to review and comment on the EA.

Individuals
Rodger Colgan
Robert Stinson
LuVerne Grussing

Non-Governmental Organizations
American Whitewater
Friends of the Clearwater
Idaho Rivers United

Tribal Governments
Nez Perce Tribal Executive Committee, Lapwai ID

State and Local Governmental Agencies
Idaho Department of Environmental Quality, Lewiston ID
Idaho Department of Fish and Game, Lewiston ID
Idaho Department of Lands, Boise ID
Idaho Department of Water Resources
Clearwater County Commissioners
Idaho County Commissioners
Idaho County, Road and Bridge Department
Clearwater Highway District

Federal Agencies
BLM Idaho State Office, Realty Program Lead, Boise ID
U.S. Army Corps of Engineers, Boise, ID
NOAA Fisheries, Boise ID and NOAA Fisheries, Grangeville ID
Fish and Wildlife Service, Boise ID
Forest Service, Nez Perce National Forest, Grangeville ID
Environmental Protection Agency, Office of Water and Watersheds

5.2 Preparers

The following individuals prepared this document:

- Daniel Gambetta, BPA Environmental Compliance Specialist (BPA Environmental Compliance Lead)
- Jeff Cartwright, Realty Specialist (BLM Realty Specialist, Project Liaison)
- Ron Grina, Senior Environmental Planner (NEPA Lead, Recreation, Transportation, Visual Quality and Aesthetics, Cultural Resources), HDR Engineering, Inc.

Becky Holloway, Senior Environmental Scientist/Biologist (NEPA Assistance, Aquatic Resources), HDR Engineering, Inc.
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Sherry Jeffery, Office Manager (Format and Editing), HDR Engineering, Inc.

Sections were reviewed by:
Craig Johnson, Fisheries and Wildlife Biologist, BLM (Biological Resources)
Judy Culver, Recreational Specialist, BLM (Recreation, Visual)
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Chapter 6
Glossary

Term	Definition
aggradation	Process in which materials/sediments carried downstream are deposited in streambeds and floodplains resulting in a rise in elevation in the bottom of the waterbody.
allopatric	Process through which new species evolve from a single ancestral species while geographically isolated
anadromous	A life history strategy of fishes that includes migration between fresh- and salt-water habitats. Reproduction and egg deposition occurs in freshwater and portions of rearing and adult life stages occur in the ocean.
backwatering	Pooling of creek water upstream of raised weir.
broodstock	Mature adult fish collected from a river system and used for the creation of juveniles in artificial production programs. Eggs and milt (sperm) are harvested from broodstock to create fertilized eggs that are incubated in the hatchery environment.
candidate species	Candidate species are plants and animals for which the USFWS or NMFS have sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.
Carbon dioxide equivalent	A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential [a measure of the total energy that a gas absorbs over a particular period of time (usually 100 years), compared to carbon dioxide]. The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated global warming potential.
carrion	The decaying flesh of dead animals
cofferdam	A watertight enclosure from which water is pumped to expose the bottom of a body of water and permit construction.
containment species	Species determined to require a special form of control aimed at restricting the spread of an invasive species and to contain the population in a defined geographic range.
Critical habitat	Critical habitat is a habitat area essential to the conservation of a listed species, though the area need not actually be occupied by the species.
DPS	Distinct Population Segment; a set of populations that is morphologically and genetically distinct from other similar populations (USFWS term).
effective population size	The number of individuals in a population who contribute offspring to the next generation
emigration	The process of leaving one area to move to another.
Emergent wetland	Wetland dominated by non-woody, soft-stemmed plants
endangered species	A population whose numbers are so small that the species is at risk of extinction.

Term	Definition
Essential Fish Habitat	Waters and substrate required for fish spawning, breeding, feeding, and a place where fish can grow to maturity or all streams, lakes, ponds, wetlands, and other viable water bodies, and most of the habitat historically accessible to salmon necessary to fish for spawning, breeding, feeding or growth to maturity.
ESU	Evolutionarily Significant Unit; A set of populations that is physically and genetically distinct from other similar populations (NMFS term).
experimental, non-essential	A population of animals or plants considered by NMFS or USFWS as not essential to the continued existence of the species (ESA term)
fishway	A structure for enabling fish to pass around an obstruction in a stream; specifically: fish ladder
floodplain	Channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.
fry	Life stage of salmonid fish still very young, but out of the redd and growing.
hydraulics	The characteristics of a river or watercourse that contribute to its water surface elevation and velocity of flow; may include topography, size or slope of the stream channel, quantity of water entering the stream, and other factors
hydrology	The characteristics of a river or watercourse that contribute to its quantity and variability of water flow; may include seasonal climate patterns, geographic location, size of the contributing drainage area, and other factors
integrated (hatchery program)	A hatchery program is an Integrated Type if the intent is for the natural environment to drive the adaptation and fitness of a composite population of fish that spawns both in a hatchery and in the wild.
interstitial water	The water present in the pores and/or fractures in rock.
kelt	A salmon that has recently spawned and is usually in poor condition; steelhead kelts may return to the ocean and spawn again in the next season.
mesic forest	A temperate hardwood forest,
non-target fish	Fish that are not the subject of spring Chinook monitoring or broodstock collection or steelhead monitoring (i.e., fish that are not steelhead or spring Chinook).
noxious weed	Noxious weeds are plant species that have been designated "noxious" by law. The Idaho Department of Agriculture uses the following criteria for designation of a noxious weed: 1. It must be present in but not native to Idaho; 2. It must be potentially more harmful than beneficial to Idaho; 3. Eradication must be economically physically feasible; 4. The potential adverse impact of the weed must exceed the cost of control.
outcrop	A rock formation that is visible on the surface
ordinary high water mark	Refers to the highest level reached by a body of water that has been maintained for a sufficient period of time to leave evidence on the landscape, including vegetation and soils.
palustrine	Related to marsh; Palustrine systems include any inland wetland that lacks flowing water and is non-tidal

Term	Definition
PIT-tag detector	Stationary arrangement of antennae that detect fish that have been tagged. Fish are detected as they swim past the antennae; tag numbers are typically recorded to enable tracking.
Pocket pools	Isolated pools located in riffles or rapids, this is a small area of calm or protected water.
Precontact	of or relating to the period before contact of an indigenous people with an outside culture
Recreation Niche	An area identified by the BLM for specific recreational uses. A Recreation Niche is specified by the BLM Cottonwood Resource Management Plan "to provide backcountry, dispersed, non-motorized recreation opportunities in an undeveloped setting with an emphasis on whitewater boating and fishing" (BLM 2009).
refugia	Habitats that support fish when ecological conditions are not suitable elsewhere (i.e., pools during low flows, low-velocity side channels during freshets).
redd	The spawning ground or nest of various fish.
rendezvous site	Place where pack members meet between hunting trips and where the pack moves when the pups are old enough to move.
riffle	A short, relatively shallow and coarse-bedded length of stream over which the stream flows at higher velocity and higher turbulence than it normally displays.
Riparian Conservation Area	BLM land management term that delineates areas of particular value for aquatic conservation. Riparian conservation areas include streams, ponds, lakes, and wetlands and unstable lands which are likely to affect the condition and/or function of the channel network and aquatic habitat.
run	Swiftly flowing stream reach with little to no surface agitation, waves or turbulence, no major flow obstructions, approximately uniform flow, substrates of variable particle size, and water surface slope roughly parallel to the overall stream gradient.
salmonids	Any of a family of elongate bony fishes (as a salmon or trout) that have the last three vertebrae upturned.
Screw trap and anchors	A temporary trapping facility placed seasonally instream to capture juvenile salmon; anchors for the instream trap are embedded along banks and attached to cables
Scrub-shrub wetland	A class of wetlands comprised of woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs.
seep	Wetland community typically occurring in depressions and at the bases of slopes in areas of upland forest.
Sensitive Species (BLM)	Those species that the BLM has determined may be in danger of rapidly dwindling to extinction. BLM continually strives to maintain and/or improve these animal populations using science, rehabilitation efforts, and through partnerships with other agencies and private land owners.
smolt	A young salmon approximately 2 years old that is at the stage of development when it is ready to migrate to the sea.

Term	Definition
Special Status Species (BLM)	A BLM-category of protection species. Special status species are those that are proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act (ESA); those listed by a State in a category such as threatened or endangered implying potential endangerment or extinction; and those designated by each State Director as sensitive.
Species of Concern (federal)	Those species for which NMFS or USFWS have some concerns regarding status and threats, but for which insufficient information is available to indicate a need to list the species under the Endangered Species Act.
Idaho State Species of Special Concern	State list of species including those that are low in numbers, limited in distribution, or have suffered significant habitat losses. List is maintained by the Idaho Department of Fish and Game (IDFG).
Subadult	An immature fish; stage in which an organism has developed many but not all adult characteristics and is not sexually mature.
substrate	The base on which an organism lives.
sympatry	Process through which new species evolve from a single ancestral species while inhabiting the same geographic region
talus field	A sloping heap of loose rock fragments lying at the foot of a cliff or steep slope
threatened species	Any species (including animals, plants, fungi, etc.) which are vulnerable to endangerment in the near future
Toe of slope	The base of a hill, streambank or other inclined surface.
undeveloped recreation-tourism market	Visitors, communities, or other constituents who value public lands for the distinctive kinds of dispersed recreation produced by the vast size and largely open, undeveloped character of their recreation settings. Major investments in facilities are excluded within SRMAs where BLM's strategy is to target demonstrated undeveloped recreation-tourism market demand. Recreation management actions are geared toward meeting primary recreation-tourism market demand to sustain distinctive recreation setting characteristics; however, major investments in visitor services are authorized both to sustain those distinctive setting characteristics and to maintain visitor freedom to choose where to go and what to do in response to demonstrated demand for undeveloped recreation.
ungulate	A hoofed mammal of the former order Ungulata
viewshed	The area that can be seen from a given viewpoint or group of viewpoints; also the area from which that viewpoint or group of viewpoints can be seen.
weir	A fence or other structure placed across the creek to block passage for the purpose of fish collection and monitoring.

Chapter 7
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Appendix A
Project Site Photographs

Appendix A. Project Site Photographs

Photo 1. Nez Perce Tribe Lower Lolo Creek trapping site located on BLM property. Rotary screw trap in front, temporary picket weir in back, workup tent and camp trailer on north (right) bank. Proposed weir would be located slightly upstream of the picket weir location shown in this photo.

Photo 2. Lolo Creek looking downstream from bridge, low flow conditions on October 19, 2010.

Photo 3. Photo from bridge looking downstream, showing existing facilities on north bank terrace, October 2010.

Photo 4. Approximate weir crossing location, looking at south (left) bank from north (right) bank, June 2011. Weir installation would require removal of the large instream boulder on the right side of the photo.

Photo 5. Weir footprint (weir proposed to be installed near large instream boulder), looking downstream from north (right) bank, June 2011.

Photo 6. Right (north) bank Lolo Creek taken from Lolo Creek Road Bridge, June 2011. Proposed fishway and trap would be located in this general vicinity.

Photo 7. Left bank Lolo Creek, approximate location of proposed left bank weir infrastructure showing upland riparian forest.

Photo 8. Existing NPT screw trap, showing overhead cable system, June 2011.

Photo 9. Right (north) bank, looking upstream toward proposed weir location (near patch of immature alder located on right bank), June 2011.

Photo 10. Right (north) bank Lolo Creek, downstream portion of parcel, proposed designated kayak put-in location, June 2011.

Photo 11. Looking South, View of Lolo Creek Road Bridge and downstream north/south bank from Lolo Creek Road from the north, June 211.

Photo 12. Lolo Creek upstream of bridge during high flow, June 2011.

Photo 13. Lolo Creek at high flows.
Seasonal screw trap and seasonal weir are visible, May, year unknown.

Photo 14. Proposed staging area landward of the north (right) bank of Lolo Creek, looking west, June 2011.

Appendix B
Wild and Scenic River Section 7 Analysis

Lolo Creek Permanent Weir and Fish Trapping Facility

Wild and Scenic Section 7 Analysis

July 2012

Table of Contents

INTRODUCTION **1**

Background 1

Outstandingly Remarkable Values in Lolo Creek 2

Scenic Outstandingly Remarkable Value 2

Recreation Outstandingly Remarkable Value 2

Fisheries Outstandingly Remarkable Value 2

Historic Outstandingly Remarkable Value 3

EXISTING FACILITIES ONSITE **5**

Existing Facilities 5

PROPOSED ACTION **7**

Project Need 7

Project Purpose 7

Construction Elements 7

Weir Facility - Upland Construction 8

Weir Facility – Instream Construction 10

Public Recreational Facilities 16

ALTERATION OF WITHIN-CHANNEL CONDITIONS **16**

Anticipated Effects to Channel Location, Slope, Geometry, Form 16

Anticipated Effects to Instream Hydraulics 17

Backwatering 18

Water Quality 19

General Impact Minimization Measures 20

Instream Construction 20

Navigation 21

Access During Weir Construction 22

Access During Weir Operations 22

ALTERATION OF RIPARIAN AND/OR FLOODPLAIN CONDITION **23**

Riparian Vegetation and Soils 23

Scenic Condition of Riparian Corridor 23

Floodplain Properties 24

In-Channel Conditions 24

ALTERATION OF UPLAND CONDITIONS **24**

Position of Activity in Uplands and Modifications to Upland Vegetation and Soils 24

Changes in Upland Conditions that Would Influence Cultural Resources 25

ALTERATION OF HYDROLOGIC OR BIOLOGICAL PROCESSES **25**

Hydrologic 25

Ability of the channel to change course, re-occupy former segments, or inundate its floodplain 25
Streambank erosion potential, sediment routing and deposition, or debris loading 25
Existing Flow Patterns Including Surface and Subsurface Flow Characteristics 25
Flood storage (detention storage) 26
Biological 26

MAGNITUDE AND EXTENT OF POTENTIAL OFF-SITE CHANGES **26**

TIME SCALE **27**

COMPARE PROJECT ANALYSIS WITH MANAGEMENT GOALS **27**

DETERMINATION **28**
Free-Flowing Conditions 28
Water Quality 28
Outstandingly Remarkable Values 29
Scenic 29
Recreation 30
Fish 30
Historic 31

REFERENCES **32**

Appendix A Project Photographs A-1
Appendix B Hydraulic Report B-1

List of Figures

Figure 1. Location of Project Site 4
Figure 2. Existing seasonally-installed picket weir and juvenile screw trap on Lolo Creek. 5
Figure 3. Existing facilities at Lower Lolo Creek Weir location. 6
Figure 4. Lolo Creek Permanent Fish Weir, proposed site plan. 9
Figure 5. Photographs of the Lostine River Satellite Facility Weir and Fishway/Trap in Lostine, Oregon (immediately post-construction, plantings not yet established along banks). 12
Figure 6. Comparison of existing surface water elevations (existing seasonal weir in place), 0% operations of new weir, and 100% operations of new weir. The gray box represents the existing Lolo Creek Road Bridge. 19

Wild and Scenic Section 7 Analysis

Lolo Creek Nez Perce Tribe Fish Weir Project

Introduction

Background

The Bonneville Power Administration (BPA) is proposing to fund the Nez Perce Tribe's (NPT's) proposal to construct a fish monitoring and collection facility to replace an existing seasonal facility located near river mile (RM) 12 of Lolo Creek, a tributary to the Clearwater River in north-central Idaho (Figure 1). The project site is located about 150 feet downstream of a bridge locally known as the Lolo Creek Road/Woodland Bridge on federal land managed by the Bureau of Land Management (BLM) in Clearwater and Idaho counties (Boise Meridian, T. 34 N., R. 4 E., sec. 17, NE¼NE¼). The BPA and BLM are cooperating federal agencies for this project. The BPA federal nexus is through funding of the proposed action, and the BLM is an authorizing agency as the land manager.

The existing seasonal weir facility, referred to as the Lower Lolo Weir, is currently operated by the NPT under a special use permit from the BLM. The weir is used to collect spring Chinook broodstock for the Nez Perce Tribal Hatchery (NPTH), and to monitor the supplementation population. The weir currently operates from about mid-May through September. The proposed action considered in this document is the installation and operation of a permanent weir and trapping facility at the Lower Lolo Weir site to monitor and evaluate adult returns for spring Chinook salmon and ESA-listed steelhead. The proposed action also includes the addition of infrastructure to support trapping and monitoring operations, as well as the addition of public recreational elements (bathroom, kayaker parking and put-in/take-out).

The BLM has preliminarily determined Lolo Creek to be suitable for Congressional designation into the National Wild and Scenic (W&S) River System (NWSRS) (BLM 2009). However, as of this writing, the BLM does not recommend the preliminarily suitable 27.19-mile Lolo Creek segment for congressional designation (BLM 2009). Rivers found eligible or suitable for the W&S River System through federal agency planning processes are not protected by the Wild and Scenic Rivers Act (Act) from proposed hydroelectric facilities or other federally-assisted water resources projects that have the potential to affect the river's free-flowing characteristics and other identified values. However, the managing agency is recommended to protect the values that make the river eligible or suitable. Pursuant to this recommendation, the BLM has required that BPA prepare a Wild and Scenic Section 7 analysis to assess project effects to Lolo Creek, specifically, its free-flowing condition, water quality, and outstandingly remarkable values (ORVs). Lolo Creek is not currently listed in the Nationwide Rivers Inventory (NRI) (National Park Service 2012); however, BPA has agreed to consult with the BLM as the land managing agency in an attempt to avoid or mitigate adverse effects due to this project.

It should also be noted that the mainstem Clearwater River, to which Lolo Creek is a tributary, is not listed in the NRI (National Park Service 2012), nor is the mainstem designated under the NWSRS. The Middle Fork of the Clearwater River has been designated under the NWSRS from the town of Kooskia upstream to the town of Lowell. Lolo Creek enters the mainstem Clearwater at RM 54, about 20 RM downstream of the convergence of the Middle Fork and South Fork of the Clearwater River at Kooskia, Idaho. As such, Lolo Creek is not a tributary to a waterbody designated under the NWSRS.

Pursuant to this BLM project requirement, a team of resource specialists from the BLM, BPA and HDR (Team) have evaluated the proposed Lolo Creek Permanent Fish Weir project. The following assessment is based on the "Direct and Adverse" evaluation protocol presented in Appendix C of the Interagency Wild and Scenic Rivers Coordinating Council's *Wild and Scenic Rivers Act: Section 7* technical report (USFS 2004). Although not required for rivers determined to be suitable for designation, the Team has made effect determinations at the end of this document relative to project effects to the free-flowing condition, water quality, and individual ORVs of Lolo Creek. The determinations are based on terminology presented in the Cottonwood Resource Management Plan (RMP) (BLM 2009), as well as USFS (2004).

Outstandingly Remarkable Values in Lolo Creek

In 2009, the BLM determined that portions of Lolo Creek within the BLM Cottonwood Field Office (CFO) planning area are preliminary eligible for designation under the W&S River System (BLM 2009). Portions of the creek included in this preliminary designation include the Lolo Creek mainstem from the confluence with the Clearwater River (T35N, R2E, S 14) upstream to the USFS boundary (T34N, R5E, S 24). The BLM determined that these areas contain the following ORVs: scenic, recreation, fish, and historic (BLM 2009). The tentative classification for Lolo Creek is "Scenic" for a total segment length of 24 river miles, of which 14.3 miles are within BLM-administered lands. Scenic rivers are those with no impoundments and largely undeveloped shorelines, but that are accessible by roads in places.

Scenic Outstandingly Remarkable Value

As reported by the BLM (2008), Lolo Creek is often boulder strewn, creating pleasing pool and drop hydrologic scenery. The lower ten miles, beginning just downstream of the project site, flows through a deeply incised canyon, with a heterogeneous riparian vegetation community ranging from forested areas with moss and fern understory to bare canyon walls and semiarid canyon grasslands.

Recreation Outstandingly Remarkable Value

A frequently-used summer swimming area occurs just upstream of the project site on lands owned by the Idaho Department of Lands. The lower ten miles of Lolo Creek contain one of the best whitewater runs in Idaho (BLM 2008). The BLM (1995) estimated that 15 individual kayakers typically boat Lolo Creek at least once per year. The majority of boaters appear to originate from Moscow, Idaho and Missoula, Montana (Culver 2011). The lower 10 river miles of Lolo Creek (beginning just downstream of the Lolo Creek Road Bridge at the weir site) reportedly contains the best whitewater in the creek (American Whitewater 2006). This section is boat-able from April to mid-July depending on the water flows and type of craft (small raft, kayaks and duckies), though there have been reports of boat trips as early as the second week of March (Culver 2011). During extremely high flow years, Lolo Creek is anticipated to be boat-able (duckies) until mid to late August (Culver 2011).

There are several recommended put-ins for boaters on Lolo Creek. One is just downstream of the Lolo Creek Road Bridge, at the existing seasonal weir site. Another is about 3 miles upstream near Cottonwood Flats (American Whitewater 2006). This run is referred to as the "Cottonwood Flats to Clearwater River" section of Lolo Creek, and it is a class III-IV whitewater. Although there is an upper river put-in (Amaral 1990), an American Whitewater posting suggests that the few extra III+/IV rapids that individuals will encounter "aren't worth the added time it takes" to access the upper put-in (American Whitewater 2006). Based on the information presented above, the recreational ORV, with respect to boat-able reaches of Lolo Creek, appears to be most predominantly utilized in the lower portions of the creek, accessed from the existing weir location or 3 miles upstream at Cottonwood Flats.

Fisheries Outstandingly Remarkable Value

Numerous fish species occupy Lolo Creek. Federally-listed Snake River steelhead and bull trout occur in the drainage, as well as BLM-designated sensitive spring Chinook salmon, Pacific lamprey, westslope

cutthroat trout, redband trout, and many other resident fish species. The diversity of habitat types in Lolo Creek provides ample opportunity for spawning and rearing, though spawning typically occurs well upstream of the project reach. In the summer months, many cold-water dependent salmon, including steelhead, Chinook and bull trout, do not occupy the project reach due to prohibitively high instream temperatures. A thorough discussion of fisheries resources is presented in the Environmental Assessment (BPA 2012) and Biological Assessment prepared for this project (BLM 2012).

Historic Outstandingly Remarkable Value

Lolo Creek was crossed by the Lewis and Clark Expedition of 1805 and the drainage was commonly used by the Nez Perce Tribe. The Lewis and Clark National Historic Trail crosses Lolo Creek in the Clearwater National Forest near Lolo Campground at river mile 25.5 (BLM 2005). The Nee-Mee-Poo, or Lolo Trail, crosses Lolo Creek in several locations, and a portion of the Lolo Trail crosses Lolo Creek near the Lolo Creek Road/Woodland bridge crossing (BLM 2008) at the project site.

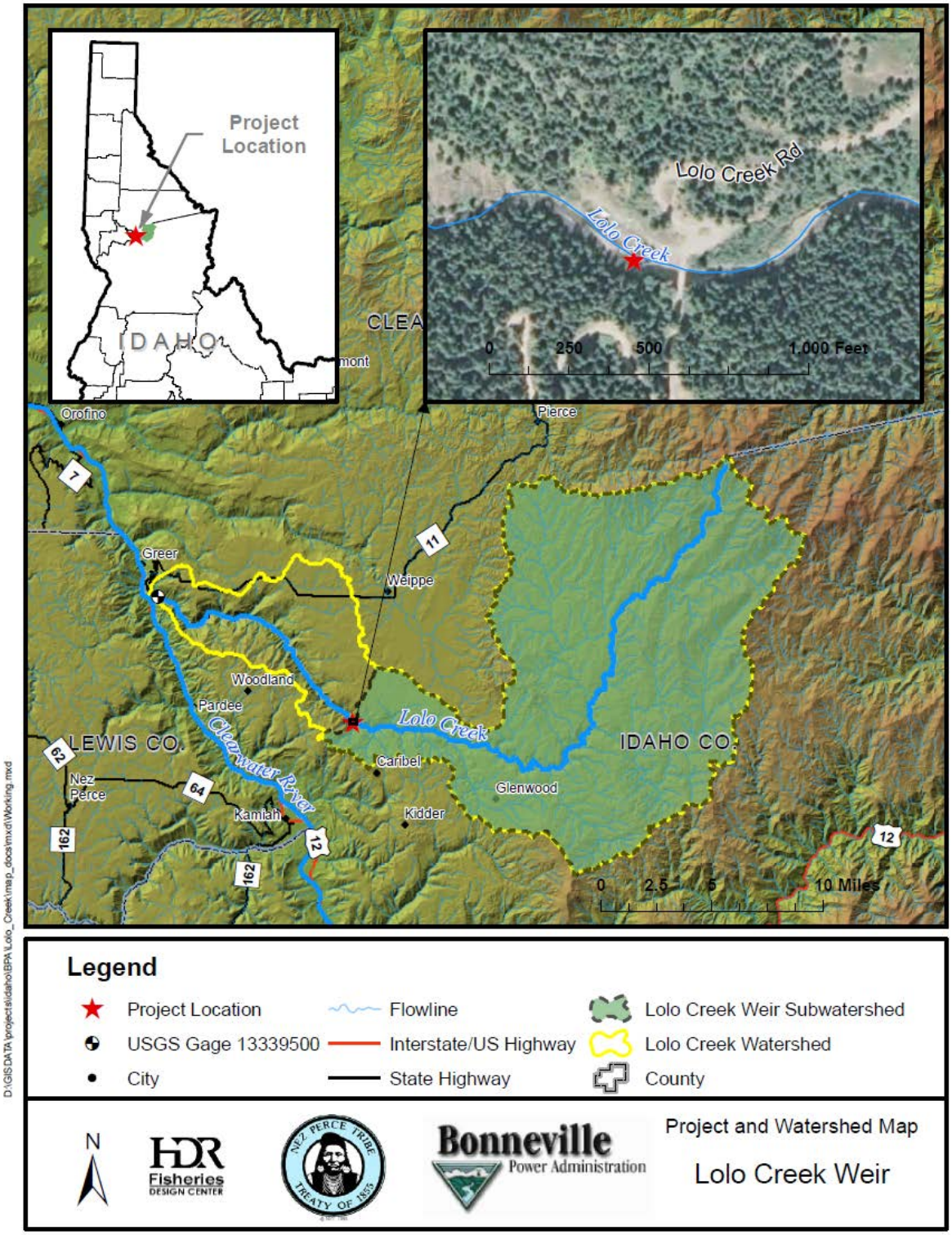

Figure 1. Location of Project Site

Existing Facilities Onsite

Existing Facilities

The existing Lower Lolo Weir facility includes a juvenile rotary screw trap and a seasonal metal picket weir (Figure 2). Approximately 1 acre along the right bank has been cleared to accommodate vehicular access and parking, a workup area, two trailers, an electrical box, and porta-potties (Figure 3). Access to the right bank infrastructure is available from Lolo Creek Road.

The juvenile screw trap is installed in one day, usually in March, and is operated through mid June; the trap is removed in the summer following the smolt outmigration period. To capture a small fall pulse of steelhead smolts, the trap is reinstalled in late August, operated through the fall, and removed in late November. The temporary picket weir is typically installed over a period of 4 days in mid-May and is operated through late September.

The current Lower Lolo Weir is manually installed in the spring when flows drop below 500 cubic feet per second (cfs). Although the existing weir functions adequately when flows are less than 500 cfs, due to safety concerns and weir performance, it cannot be installed or operated during high flow events. These high flows typically occur in May and June, and coincide with the onset of the spring Chinook run. As such, high flows prohibit collection and monitoring of representative spring Chinook throughout the extent of the run. These limitations restrict the number and genetic variety of adults collected for broodstock and prohibits comprehensive monitoring of the returning spring Chinook population.

At this time, the weir does not operate during the winter/spring adult migration period for Lolo Creek steelhead. The existing picket weir could not safely be installed to collect steelhead in its current state.

Figure 2. Existing seasonally-installed picket weir and juvenile screw trap on Lolo Creek. The yellow dashed line indicates the approximate location of the new permanent weir. The proposed fishway and trap would extend upstream of the line along the right bank.

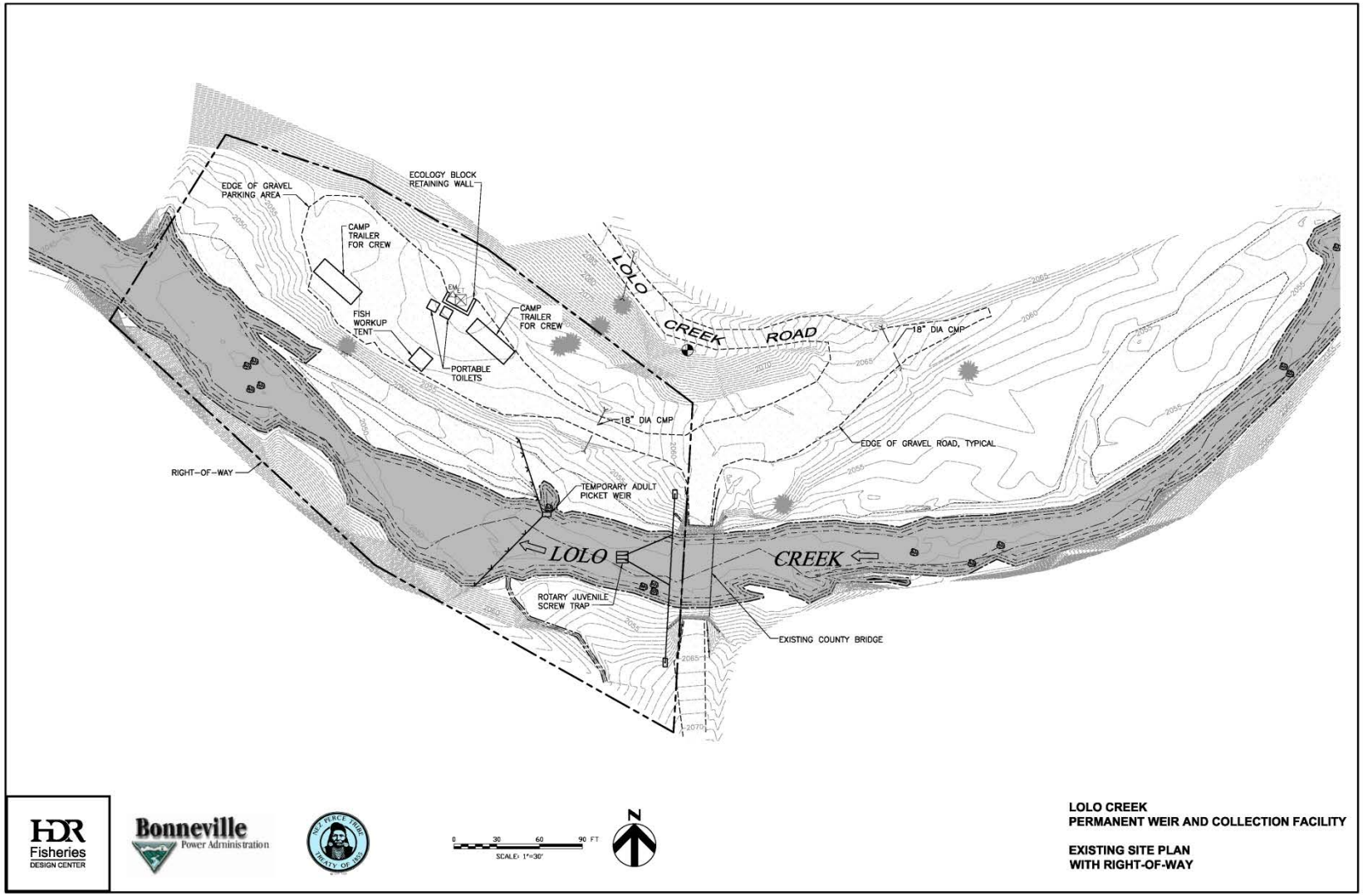

Figure 3. Existing facilities at Lower Lolo Creek Weir location.

Proposed Action

Project Need

BPA needs to decide whether to provide funding to the NPT for its proposal to replace the existing Lower Lolo Weir with a permanent weir and fish trapping facility that will enhance fish monitoring and data collection in the Lolo Creek drainage area. The permanent weir would replace an existing seasonal, temporary fish collection facility that the NPT has operated since 2002. The existing system has limited effectiveness and durability, and cannot be used during high flows that occur during the spring. For these reasons, the existing seasonal weir cannot be used to monitor Lolo Creek steelhead (*Oncorhynchus mykiss*) populations, which are federally-listed under the Endangered Species Act (ESA).

In accordance with the Federal Land Policy and Management Act (FLPMA), BLM needs to decide whether to amend the NPT's existing seasonal weir right-of-way (ROW) to accommodate the permanent weir and associated facilities.

Project Purpose

In meeting the need for action, BPA will attempt to achieve the following purposes and use them to evaluate the alternatives considered in the EA:

- Act consistently with all applicable laws, regulations, and policies that guide the agency;
- Support efforts to mitigate for effects of the Federal Columbia River Power System (FCRPS) on fish and wildlife in the mainstem Columbia River and its tributaries, pursuant to the Northwest Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 839b(h)(10)(A));
- Seek to fulfill commitments to implement the pertinent Reasonable and Prudent Alternatives (No. 50.5) listed for Snake River B-run steelhead in the 2008 FCRPS Biological Opinion, as amended by a Supplemental Biological Opinion in 2010 (NMFS 2008; 2010). Specifically, "provide additional status monitoring to ensure a majority of Snake River B-Run steelhead populations are being monitored for population productivity and abundance";
- Minimize environmental effects; and
- Act in a cost-effective manner.

BLM seeks to ensure that the NPT's operation of the weir does not alter the free-flowing nature of the river, and allows for other recreational users to continue enjoying the natural benefits of the creek.

Construction Elements

Upland construction and mobilization for construction of the proposed facility (Figure 4) would likely commence in the spring of 2013 (April or May). In-water elements would be constructed at the beginning of the project-specific, agency-approved in-water work window of August 1 – October 31. This window was agreed-upon in October 2010 with Mr. Bob Ries at NMFS (Ries 2010), Mr. Clay Fletcher at USFWS (Fletcher 2010), and Mr. Ray Hennekey at IDFG (Hennekey 2010).

Prior to operation of the proposed fish weir facility, the NPT, BPA and BLM would work with Clearwater and/or Idaho counties to determine the appropriate location to affix a sign to the Lolo Creek Road Bridge. This sign would warn recreational users of the downstream barrier; it would read "Warning! Instream Barrier Ahead. Exit via Right Bank Downstream of Bridge", or similar.

Weir Facility - Upland Construction

Approximately 3,000 square feet of currently disturbed/graded uplands along the right bank (looking downstream; or north bank) terrace of Lolo Creek would be graded to a finished elevation of 2,057 feet, which is the existing elevation. Existing facilities that would be maintained in their current condition include a trailer pad for staff housing and electrical equipment. There is currently no potable water source (well) or septic system on site and no new facilities would be added under the Proposed Action.

Access and Infrastructure

Access to the lower portion of Lolo Creek is extremely limited. Of several sites considered in the Lolo Creek drainage, only two sites have county-maintained roads, and the existing site is the only one located on public lands. The location of the Proposed Action has been in use by the NPT for juvenile screw trap and temporary weir operations for over 10 years, and a fish detection system was installed at the site in the fall of 2011. The existing weir site contains ample parking (can accommodate 5-7 work trucks), adequate fish truck turnaround space, public-accessible porta-potties, cement block wall (or ecology block wall, protecting power supply) trailer parking sites and upgrades for telephone services. These features would be maintained under the Proposed Action, though the porta-potties would be upgraded to an ADA-accessible vaulted toilet.

Screw Trap Anchors

The seasonally-installed juvenile screw trap is currently held in place using cables attached to cement blocks positioned on the north and south banks of Lolo Creek. Under the Proposed Action, buried north and south bank anchors would replace this anchoring system. The anchors would be installed in the footprint of the existing cement block anchors located immediately downstream of bridge abutments. No other modification to screw trap infrastructure or operations is proposed under this alternative.

Mechanical Building and Workup Shelter

A small building (10 feet by 15 feet) would be constructed landward of the fish trapping facility to house the weir's hydraulic system. The hydraulic lines (providing air to lift the weir panels and oil lubrication) would be buried from the building to the cylinders that lift the barrier up and down. The oil utilized in this system will be synthetic hydraulic oil as recommended by NMFS; however, no oil would be stored on-site. A pre-fabricated metal workup shelter (15 feet by 20 feet) would be installed just landward of the fishway to provide a covered area for fish data collection at the trap.

Staging Area

Construction equipment would be staged on the north bank landward of silt fencing placed along the outer edge of graveled areas that have been previously cleared and filled (Figure 4).

Riparian Plant Enhancement Area and Site Restoration

To mitigate for disturbance along the streambank due to installation of the collection weir, particularly for removal of up to three mature conifers on the south bank (left bank looking downstream) of Lolo Creek, portions of the north bank riparian corridor would be planted with native shrubs. Along the north bank, downstream of the proposed boater-launch area (at the western-most portion of the site), portions of the bank would be planted with native species including cedar (*Thuja plicata)* saplings and several willow bundles (*Salix sitchensis*).

Following construction, disturbed upland areas would be seeded with appropriate native species. Streambanks would be planted with willows in areas where riparian shrubs are removed to accommodate construction equipment.

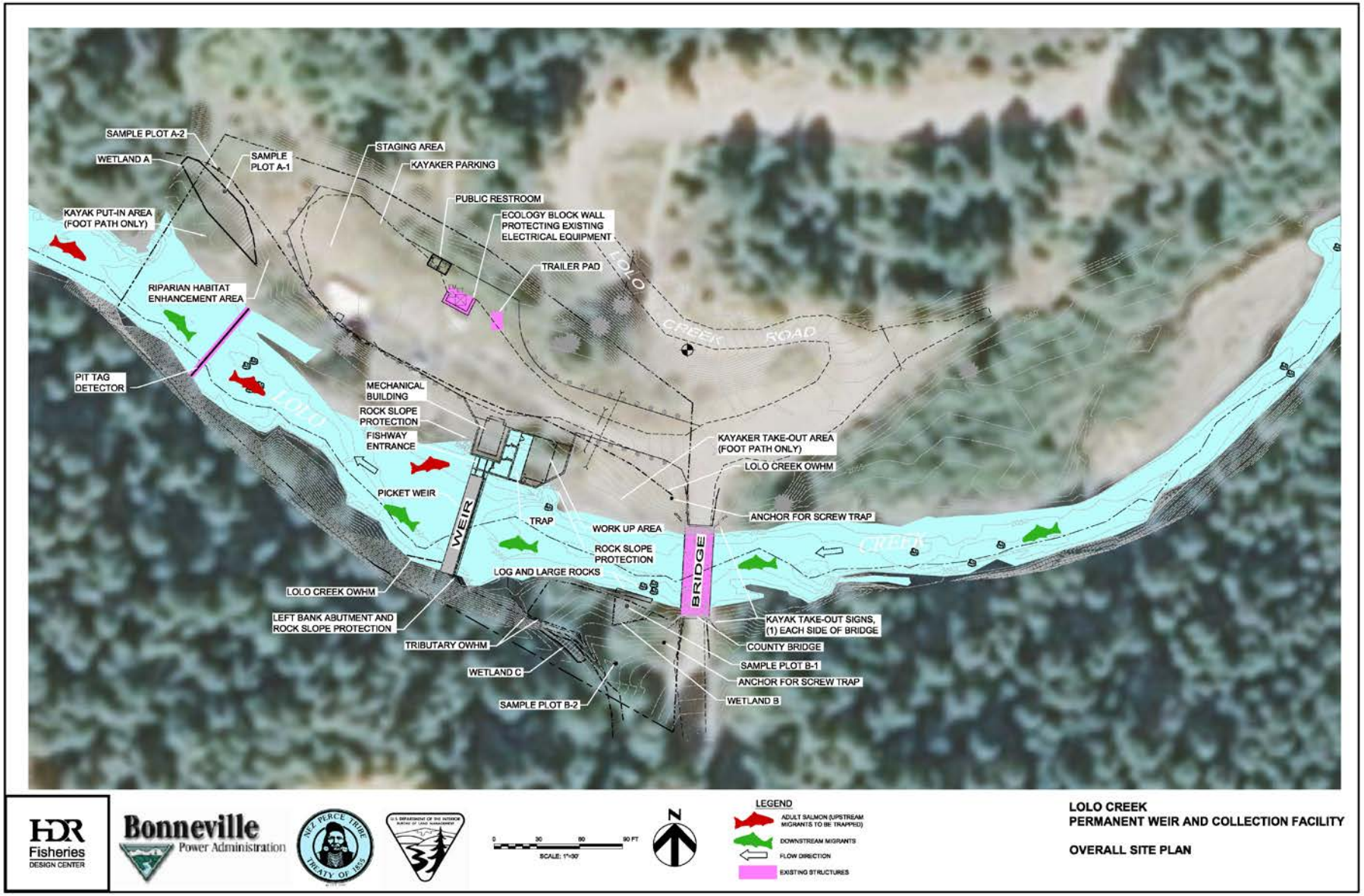

Figure 4. Lolo Creek Permanent Fish Weir, proposed site plan.

Weir Facility – Instream Construction

The following structures would be constructed in the dry behind cofferdams during the in-water work period of August 1 – October 31 (Figure 4):

- Picket weir, including concrete sill, low flow notch and bank abutments
- Vertical slot fishway
- Fish trapping and holding area
- Streambank protection rocks

In addition, several large instream boulders would be removed from the weir footprint. The boulders would either be manually relocated downstream of the proposed weir location using excavators behind the cofferdams, or removed via fracturing. If fracturing is used, it would occur in the dry behind isolation cofferdams. Fracturing may occur via use of small detonators or by use of techniques such as the "Boulder Buster™". If detonators are used, a small hole would be drilled into the boulder and a small explosive would be placed into the rock to fracture the boulder into smaller pieces that can be more easily moved from the construction footprint. The "Boulder Buster" breaks up rocks and boulders without the use of explosives or a certified blaster, but rather via use of a portable machine and cartridges that are transported to the site.

Details regarding each in-water element are described following the proposed dewatering plan. Erosion and sediment control measures would be implemented prior to initiation of construction activities. A silt fence would be placed along the top of the bank at the edges of the excavation area and would tie into the cofferdam to minimize sediment transport to the creek. A silt fence would also be placed along the top of bank of the small intermittent channel that enters the creek just downstream of the construction area, and around several small wetlands on the left and right banks.

Lolo Creek Work Area Isolation

Construction of instream elements, including the weir, fishway and trapping facility, would occur from August 1 – October 31. This project-specific in-water work window was approved by NMFS (Ries 2010), USFWS (Fletcher 2010) and IDFG (Hennekey 2010). Work area isolation structures would be installed prior to the initiation of instream construction, and fish salvage would occur behind isolation structures prior to dewatering. The purpose of isolation structures is to separate the construction area from the active channel. This isolation would therefore minimize the amount of sediment and debris that enters Lolo Creek. Although the precise approach to instream work area isolation would be tailored to instream conditions at the time of construction, the most likely approach would dewater half or more of the creek using cofferdams that effectively push the creek to the opposite side, and temporary culverts that route the creek past the work area. Cofferdams would consist of large gravel-filled bags, concrete blocks or water-filled aqua bags covered with thick plastic to seal the area. Screened pumps would remove water from behind the dewatered work area, and that water would be settled prior to discharge back into the creek. Prior to dewatering, NPT biologists would remove any trapped fish from the work area. Once instream construction is complete, the isolation structures would be removed and the creek would return to its channel.

During instream construction, the existing seasonal picket weir used for trapping would be installed downstream of the in-water construction area so that fish collection can continue during the construction period until the end of September. The instream construction reach would not be accessible to boaters from August through September of the construction year. Since instream work would occur in the low-flow summer period, it is unlikely that many individuals would

desire to boat the creek during the instream work window. However, if flows are high, some boaters may desire to float the creek from upstream put-ins. However, providing public access through the construction area would be a public safety hazard and would create liability issues for the Contractor and action agencies.

Picket Weir and Concrete Sill

A hydraulically-controlled picket weir is proposed to be constructed in the general footprint of the existing seasonal weir. The new weir would function by raising picket panels upwards to an approximate 45-degree angle. At full extension, the pickets would lift, blocking fish passage, but allowing the creek to flow through the spaces between the pickets. Once reaching the weir, upstream migrants would be attracted to flow from the right bank fishway (ladder). They would then ascend up the ladder and into the trap area. Upon entering the trap, fish would be sorted for transport and life history data collection, and non-target species would be returned to the creek. The weir would operate from as early as January through September.

The proposed weir and associated trapping facility would look similar to the recently-constructed Lostine Satellite Facility weir and trapping facility shown in Figure 5. However, concrete would be colored to match the surroundings to minimize negative effects to the scenic ORV of the creek.

The new picket barrier would consist of hydraulic lifts and hinged pickets mounted to a concrete sill. The pickets would be spaced to provide a 1.00-inch clearing to allow the downstream passage of juvenile fish. During operations, the barrier would be raised. When not in use, the picket panels would slope downstream to facilitate passage of bedload and debris. At the highest weir position, the weir crest would be located approximately 3 ft above the sill with 2 ft of picket projection from the water surface to the top end of the picket.

Installation of the new weir would require construction of a cast-in-place concrete sill onto which the hydraulic lifts and gate hinges would affix. The sill and apron would be embedded into the substrate, extending approximately 1.5 ft above the existing thalweg, or approximately eight to ten inches above the average creek bed. The concrete apron would be approximately 10 ft wide and would span the entire width of the creek (about 75 feet in this location). Concrete abutments would anchor the sill to the right and left banks, and a minor amount of rocks might be necessary to protect the abutments. However, the left bank abutment location is bedrock and rock protection may not be required.

The facility would be designed to operate up to maximum creek flows of 2,000 cfs. This corresponds to approximately the 2-year flood frequency based upon flow data collected from the local gage (at Lolo Creek Road Bridge) as well as at USGS gage ID 13339500. At flows greater than the anticipated 2,000 cfs limit, the picket panel would be lowered to protect the facility from damage. Following lowering, the minor amount of backwatering experienced upstream of the structure would be reduced since the head loss through the pickets would be eliminated and the upstream surface water elevations would drop slightly. The high operational flow was established based on experience with these systems, and communication with the NPT. The NPT deemed it acceptable to have a short period of down time every other year. This scenario corresponds to the 2-YR flow, where there is a 50% chance of recurrence every year, or in other terms, one chance every other year.

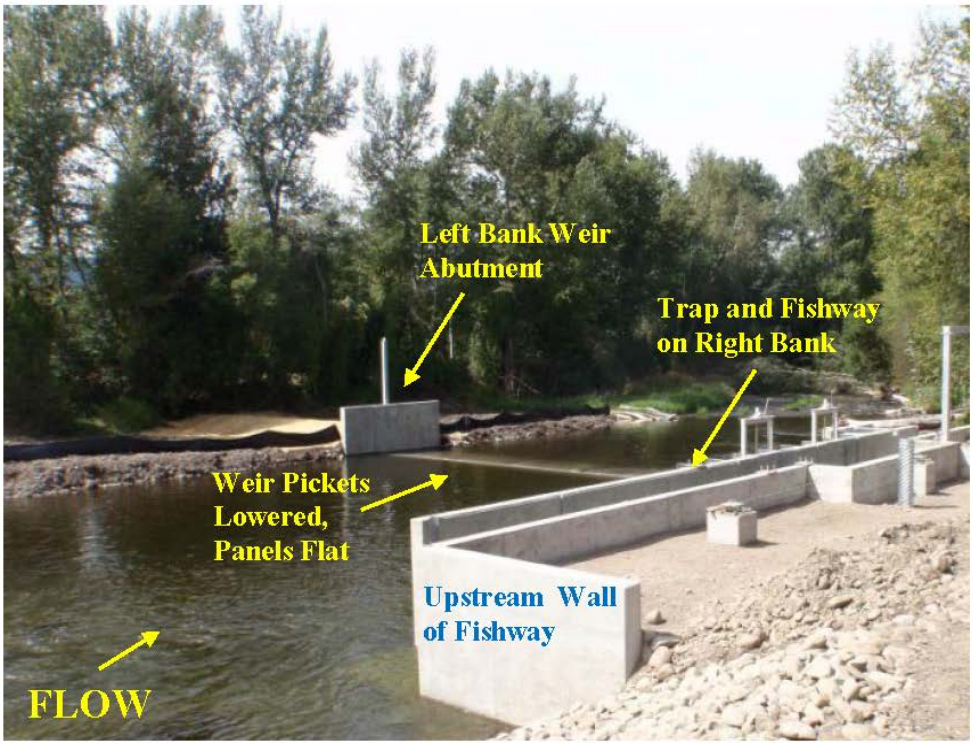

Figure 5. Photographs of the Lostine River Satellite Facility Weir and Fishway/Trap in Lostine, Oregon (immediately post-construction, plantings not yet established along banks).

Photos show both operational and non-operational periods with weir raised and lowered. The proposed permanent fish barrier on Lolo Creek would look similar to this structure.

A four-foot wide opening would be notched into the concrete sill on the right bank edge where water is directed to support trapping operations. The bottom of this low-flow notch would be level with the upstream substrate elevation. A one-dimensional hydraulic model was used to verify anticipated low flow hydraulic conditions and water surface differential through the notch. During non-operational low flow periods (October through January), this notch would provide passage as water would move freely through the opening.

Hydraulic modeling (HDR 2011a) indicates that flows below 10 cfs would be directed entirely down the fishway or low flow notch. Although rare, flows during the month of September have been recorded as low as 10 cfs over the period of record at the downstream USGS gage (ID 13339500). When flows exceed 10 cfs, water would begin to flow over the sill while still supplying the majority of flow to the fishway. As flows increase, the flow would naturally be divided proportionately through fishway and over the sill until the maximum fishway flow of about 25 cfs is reached. At that point the facility is designed so that the remaining flow is passed over the sill. During periods of low flow, the water level would be relatively flat from slot to slot, allowing passage through minimal slope and gradient. Water would enter the fishway via a gated opening on the creek-side of the trapping structure. This opening would be closed during non-operational periods. The finished floor elevation of the fishway has been set appropriately to facilitate hydraulic preference. Specifically, the floor of the fishway is set below the sill elevation. Thus, water would flow down the low-flow notch or the fishway during low flow periods due to the backwater condition developed by the concrete sill.

Vertical Slot Fishway and Trap

During operation, upstream passage around the weir would be accommodated through a vertical slot fishway on the north bank. According to NMFS, steelhead and salmon prefer this type of fishway over “pool and weir” types (NMFS 2003a). In addition, due to the known occurrence of Pacific lamprey in Lolo Creek, the fishway would be designed to pass adult lamprey. To accommodate lamprey passage, the fishway would contain rounded walls and sill blocks.

Approximately 338 cubic yards of streambed and bank would be excavated to install the north-bank abutment and fishway/trapping structure. Excavation of the streambed would be minimized to maintain the natural grade of the creek through the fishway. Following construction, the stream bank would be re-vegetated with native species, including willows.

Considering the highest flows experienced at the site, the fishway would accommodate both juvenile and adult salmonid passage during weir operations to meet NMFS passage guidelines (NMFS 2011). The fishway has been designed to provide appropriate attraction flow over the full range of flows experienced at the weir. During high flow periods, the maximum height between each vertical slot would be 12 inches, in accordance with NMFS fish passage criteria (NMFS 2011).

A small trapping structure would be constructed adjacent to the weir along the north bank. This structure could accommodate a lifting system that would mechanically raise fish to a working area if future funding became available. This lifting system would require installation of additional infrastructure in the trap area, but not within the creek itself. As such, no dewatering of the creek or associated fish salvage would be required. If the lifting system is added to the site in the future, construction and operation would occur in compliance with all applicable state, federal and local regulations. No additional effects to resources beyond those described in this EA from installation of a future lifting are expected to occur.

To protect against potential structural damage during high flow events, a concrete retaining wall would extend approximately seven feet upstream of the structure along the bank. A work shelter would extend landward of the north bank trap and into the area behind the retaining wall. This shelter would be used to record, measure, and sort all fish species that ascend the fishway.

Streambank Protection

Streambanks adjacent to the proposed weir and fishway/trap may be subject to scour during high flows. Large rocks would be added to the upstream and downstream face of the fishway/trap on the north bank to reduce the potential for bank erosion and the introduction of fine sediments. The south bank is comprised of bedrock; however, a small amount of rocks may be required to protect the south side abutment. Placement of rocks used for bank protection would be designed per U.S. Army Corps of Engineers (USACE) Section 404 Clean Water Act permit specifications, and the rocks would come from a local BLM-approved source. Rocks would not protrude into the channel to a degree that would affect the free-flowing nature of the creek.

New Facility Operations

Trapping Periods

As previously described, the existing seasonal picket weir operates from about mid-May through September. The new permanent weir would operate from as early as January through September to monitor Snake River steelhead (passed upstream to spawn), and to collect or pass spring Chinook. Seasonal ice may delay weir start up until February or March. Sedimentation would be mitigated by the frequent lowering of pickets during high flows to flush accumulated materials behind the weir. During operational periods, the raised barrier would block all upstream migrating adult fish; however, juvenile fish (including salmon smolts) would pass downstream through the pickets. From May through September, this is essentially an existing condition as all upstream migrants are currently blocked by the seasonal picket weir.

The trapping structure would be visually inspected daily, and up to three times during spring Chinook broodstock collection periods. Trapped, non-target fish would be held for no longer than 24 hours before being returned to Lolo Creek upstream of the trapping structure via a fish return bypass pipe. Because the creek stage varies dramatically during the proposed operational period, the return pipe would consist of flexible tubing that would be attached to a fixed pipe from the work area. The tubing could be positioned anywhere along the bank, allowing managers to assess instream flows and return fish to the creek in locations most conducive to continuation of upstream migration. This would minimize handling of non-target species. The return tubing would be in place during trapping periods and removed once trapping is complete. The pipe and tubing would be sized to transport an adult salmonid typically encountered in Lolo Creek, would have an appropriate slope, and would discharge into an area of the creek that is of adequate depth in relation to the drop out of the end of the pipe.

During trapping, spring Chinook brood fish would be transferred to a separate holding area until the end of day when they are transferred to haul trucks, which would access the work area via the existing facility access road (refer to photos in Appendix A). Spring Chinook in excess of weekly broodstock goals would be passed upstream to spawn naturally. Steelhead interrogated at the weir would be measured, sexed, and checked for tags before being released upstream to spawn naturally. The trap would be checked a minimum of once per day, but during the typical migrational period, the trap would be checked twice per day (morning and evening). If steelhead kelts are observed upstream of the weir, they would be passed by lowering the weir. It is anticipated that lowering activities would take approximately 30-40 seconds. NPT staff would be on site 24 hours a day, 7 days a week to monitor conditions on the upstream side of the weir and

the weir would be lowered when downstream migrating adults are observed. The method of weir lowering for downstream migrants is an improvement over existing conditions.

During operational periods, migrating juveniles would pass directly through the pickets, which would be spaced to provide 1.00-inch clearance, in accordance with juvenile passage criteria. Picket-passage would be available when flows are high enough to pass over the sill. Flows are typically high during the spring outmigration period for steelhead and Chinook; however, low flows may be encountered by steelhead smolts that outmigrate from Lolo Creek in the fall. Due to velocity and height barriers created by the weir, juvenile passage through the pickets may not always be possible. This is likely an existing condition in the creek during high flow events. When picket-passage is not feasible, passage would be accommodated through the new fishway on the right bank. The upstream entrance of the fishway/trapping structure would contain a picket gate sized with 1.00-inch openings that would prevent adults from exiting, but would allow juveniles to pass upstream and downstream.

Non-Trapping Periods

During non-trapping periods (October through January, or later depending on creek icing), the picket barrier would be positioned to have a slight down grade slope, allowing fish (and boats) to pass directly upstream or downstream over the weir. The elevation of the concrete sill would be about 8 inches higher than the existing average substrate elevation (1.5 feet higher than the thalweg). Although it is anticipated that substrate would backfill behind the sill over time, the sill has the potential to create a passage barrier during extreme low flows, e.g., when flows are not sufficient to overtop the sill. This may occur at flows of on the order of 10 cfs. Although average flows from October through January are typically higher than 10 cfs, if extreme low flows are encountered the weir has been designed to provide passage. A four-foot wide opening would be notched into the concrete sill on the right bank edge where water is directed to support trapping operations. The bottom of this notch would be level with the upstream substrate elevation and would provide passage during low flows as water would move freely through the opening. During operational periods, this notch would be closed with a gate and/or flashboards to prevent use of the opening by targeted spring/summer Chinook and Snake River steelhead.

Facility Maintenance

Throughout the operational period, it may be necessary to perform minor maintenance actions to ensure that the weir and ladder are functioning appropriately. Although the nature of instream work necessary to maintain the facility cannot be predicted at this time, it is possible that the following actions, among others, may be necessary at some point during the operational period:

- Fill of minor scour holes in the vicinity of the weir sill.
- Replacement of weir panels that are damaged by large objects moving downstream.
- Minor excavation at the ladder entrance and exit, and within the ladder/trap itself, to ensure passage is not encumbered by accumulated bedload.
- Minor excavation of the non-target fish return pool to ensure appropriate depth and slope.
- Repair/replacement of rock slope protection to maintain the integrity of facility infrastructure.

Necessary maintenance activities would likely be accomplished in the wet (in the active channel without dewatering) considering the minor nature of actions, the remote nature of the site, and the likelihood that activities can be completed in a short amount of time (1-5 days). Instream maintenance activities would occur during the low-flow summer season (approximately late July through September). If work is required outside of the low flow summer season to ensure continued operations, the BLM, BPA, and NPT would coordinate with the appropriate regulatory agencies to obtain permissions.

Public Recreational Facilities

As part of the NPT ROW amendment agreement with BLM, BPA has agreed to contribute funding for public recreational facilities at the project site. These facilities would be funded by the BLM, as well as BPA and the NPT.

Vault Toilet

An ADA-accessible vaulted toilet would be installed in the upland area along the cleared flat of the north bank of Lolo Creek. Installation would require excavation of a pit followed by placement of the vault into the ground. This toilet would be accessible to the public.

Boater Put-in and Take-out

A boater put-in would be designated downstream of the weir along the north bank (Figure 4). A boater take-out would be designated on the graveled north bank just upstream of the weir facility, downstream of the Lolo Creek Road Bridge.

Boater Parking

Signage would be used to designate up to two parking spaces at the western-most end of the parking lot for boaters. These parking spaces would be used by recreational boaters (i.e., kayakers) to provide access to the designated kayak put-in area, located along the north bank downstream of the proposed weir (Figure 4).

Informational Panel and Signage

A small, removable informational panel would be added on the north bank in the upland area near the entrance to the site off Lolo Creek Road. In addition, a sign would be affixed to the upstream side of the Lolo Creek Road Bridge to warn kayakers of the downstream weir and to direct them to the designated boater take-out, downstream of Lolo Creek Road Bridge on the north bank.

Alteration of Within-Channel Conditions

By its nature, a picket weir allows surface water to flow through the structure (see Photo 1 in Appendix A, showing temporary picket weir). As such, the weir design would maintain the free-flowing nature of Lolo Creek. However, the permanent concrete weir would result in local modifications to in-channel conditions. A detailed analysis of anticipated effects to instream hydraulics and channel conditions due to proposed weir operations is included in Appendix B (*Technical Memorandum: Evaluation of Existing and Proposed Hydraulic Conditions at the Lolo Creek Satellite Facility*; HDR Engineering, Inc. 2011). The memo summarizes effects to localized water surface elevations, depth, velocity, and the channel bed at representative sections upstream and downstream of the proposed weir location.

Anticipated Effects to Channel Location, Slope, Geometry, Form

The potential for lateral channel migration to the left is not possible due to the relatively confined nature of the channel along the left bank and the presence of bedrock canyon walls. The proposed facilities associated with this project would not affect floodplain inundation or channel migration patterns. The right bank terrace is overtopped at the 50- and 100-year recurrence intervals (HDR 2011). The proposed project would not significantly alter flow patterns downstream of the weir. Flow over the weir would not be artificially confined or directed in a manner that would change the current thalweg location or hydraulic preference. The flow field downstream of the weir would mimic conditions currently observed at the site. Alteration of flow patterns that promote shifting of the thalweg or comprise toe stability is not anticipated. Therefore, the potential for bank erosion is limited. Minor backwatering during high flow periods when the weir is in operation may slightly increase the frequency of bank inundation in areas that

are already subject to floodflows; however, any increase in bank erosion is unlikely since bank conditions upstream of the bridge are stable (Photo 11, Appendix A). As shown in Photo 11 (Appendix A), the right and left banks upstream of the bridge are composed of large boulders and bedrock that are not subject to erosion. A floodplain exists on the right bank. This floodplain is comprised of vegetated habitat that is somewhat braided with gravel deposits. However, this floodplain already inundates at the 2- to 10-year recurrence intervals.

The channel form is relatively straight in the project reach. The proposed weir facility would not alter the ability of the river to meander as lateral channel migration is largely controlled by the bedrock wall along portions of the left bank both upstream and downstream of the bridge.
The river geometry is currently altered by the presence of a bridge upstream of the project. Changes in channel geometry due to implementation of the proposed project are anticipated to reduce bankfull top widths to more typical conditions found upstream and downstream of the project and bridge crossing area. Typical channel widths upstream of the bridge are measured to range from 50 to 70 feet. The existing bridge span is 65 feet. Channel widths range from 80 to 90 feet downstream of the project. The proposed project would be constructed approximately 150 feet downstream of the existing bridge where the current bankful width is approximately 125 feet. Here, it is anticipated that construction of new structural walls, concrete wall abutments, and the concrete weir would constrict the channel to a 75-foot top width. This constriction occurs in a transition area downstream of the existing bridge where channel widths are increasing from 65 feet to 90 feet. Therefore, the 75 foot channel width at the proposed project location is anticipated to accommodate the hydraulic expansion.

Some noticeable changes to the streambed elevation would be observed due to the accumulation of bedload immediately upstream of the sill. It is anticipated that bedload would aggregate to the elevation of the sill and would then extend upstream at a slope similar to existing conditions. Accumulation is anticipated to occur to the crest of the proposed sill with a maximum accumulation depth of 1.5 ft. This may result in bedload accumulation for a distance of approximately 165 feet upstream to the downstream face of the existing bridge. Seasonal flows would continue to create shear-stresses underneath the bridge that maintain bed elevations similar to existing conditions. At that point, bedload transport would continue to occur at a natural state of equilibrium that would fluctuate depending on the severity of the water year. The resulting streambed area of impact upstream of the sill is estimated to be 0.15 acres.

Anticipated Effects to Instream Hydraulics

Impacts to instream hydraulics in the vicinity of the proposed weir were evaluated in Appendix B ("Technical Memorandum: Evaluation of Hydraulic Impacts, Lolo Creek Satellite Facility" [HDR 2011a]). The memo describes impacts to surface water elevations and stream velocities due to weir presence and operation at different river flows. For the purpose of the hydraulic analysis, the existing condition was modeled based on conditions experienced under baseline conditions when the seasonal weir is in operation. The 0% operation model was based on the presence of the new weir in the down (non-operational) position; the 100% operation model was based on the new weir in the up (fully raised) position.

Water surface elevations were calculated for existing, 0% operation (weir lying flat on riverbed) and 100% operation scenarios (weir raised to full position) at main channel distances of 575.28 ft, 476.01 ft and 400.10 ft (see Appendix B for hydraulic basemap showing channel cross section locations). At the closest location to the bridge (main channel distance 575.28 ft), the water surface elevations are anticipated to increase approximately 0.35 ft and 1-foot from existing conditions to 0% operation conditions during the 2-year and 100-year flood event, respectively.

Based on hydraulic modeling, water surface elevations could increase approximately 1.27 feet at the 2-year flood event during 100% operations. The weir panels would be at a 0% operation condition at any flow above the 2-year flood event. This results in a calculated backwater effect that is estimated to diminish as the main channel distance decreases.

Water surface elevation profiles calculated for existing and 100% operation scenarios at the 2-year flood event are estimated to match at a main channel distance of 1,050 feet which corresponds to approximately 640 feet of channel length. In other words, when the pickets are raised, increased water surface elevations would be measurable about 640 ft upstream of the weir compared to existing conditions. Water surface elevation profiles calculated for existing and 0% operation scenarios at the 2-year flood event are estimated to match at a main channel distance of 950 feet which corresponds to approximately 500 feet of channel length. In other words, when the pickets are lowered (i.e., weir down), increased water surface elevations would be measurable about 500 ft upstream of the weir. To summarize, during the 2-year flow event, water surface elevations would be greater for a distance of 640 ft upstream when the weir is raised, and 500 ft upstream when the weir is lowered.

At main channel distance 400.10 ft, the 0% (weir down) operation and 100% operation (weir up) water surface elevations match. In other words, during the 2-year flow event, water surface elevations under both the weir lowered (0%) and weir raised (100%) scenarios would be the same about 400 ft upstream of the weir. Local velocities would increase slightly downstream of the weir structure but would decrease upstream of the weir due to backwatering.

In the weir down position, modifications to flow and velocity downstream of the weir would be negligible during spring runoff. Water surface elevations are anticipated to decrease downstream of the weir by 0.08 ft at main channel distance of 400.1 ft. Velocities are expected to increase at the location of the proposed weir structure by as much as 1.73 ft/s.

In summary, hydraulic analyses suggest that the proposed weir facility would result in a minor impact on water surface elevations during both the 0% (weir down) and 100% (weir raised) operations. Velocities would increase slightly downstream of the weir, but would decrease upstream.

Backwatering

Backwatering upstream of the existing seasonal weir is minor. Under proposed permanent weir operations, this backwatering effect would be slightly elevated. The total wetted area under the existing conditions scenario is estimated to be 1.70 acres. The total wetted area of impact upstream during the 100% operational scenario of the new weir is estimated to be 1.84 acres. This corresponds to a potential increase in wetted habitat along the perimeter of the creek channel (upstream of the weir) of 0.14 acres over 640 feet of stream (Figure 6) compared to existing conditions. This increase is not anticipated to result in measureable hydraulic changes with regard to inundation of adjacent floodplains, side channels, or overbank area with regard to frequency or depth.

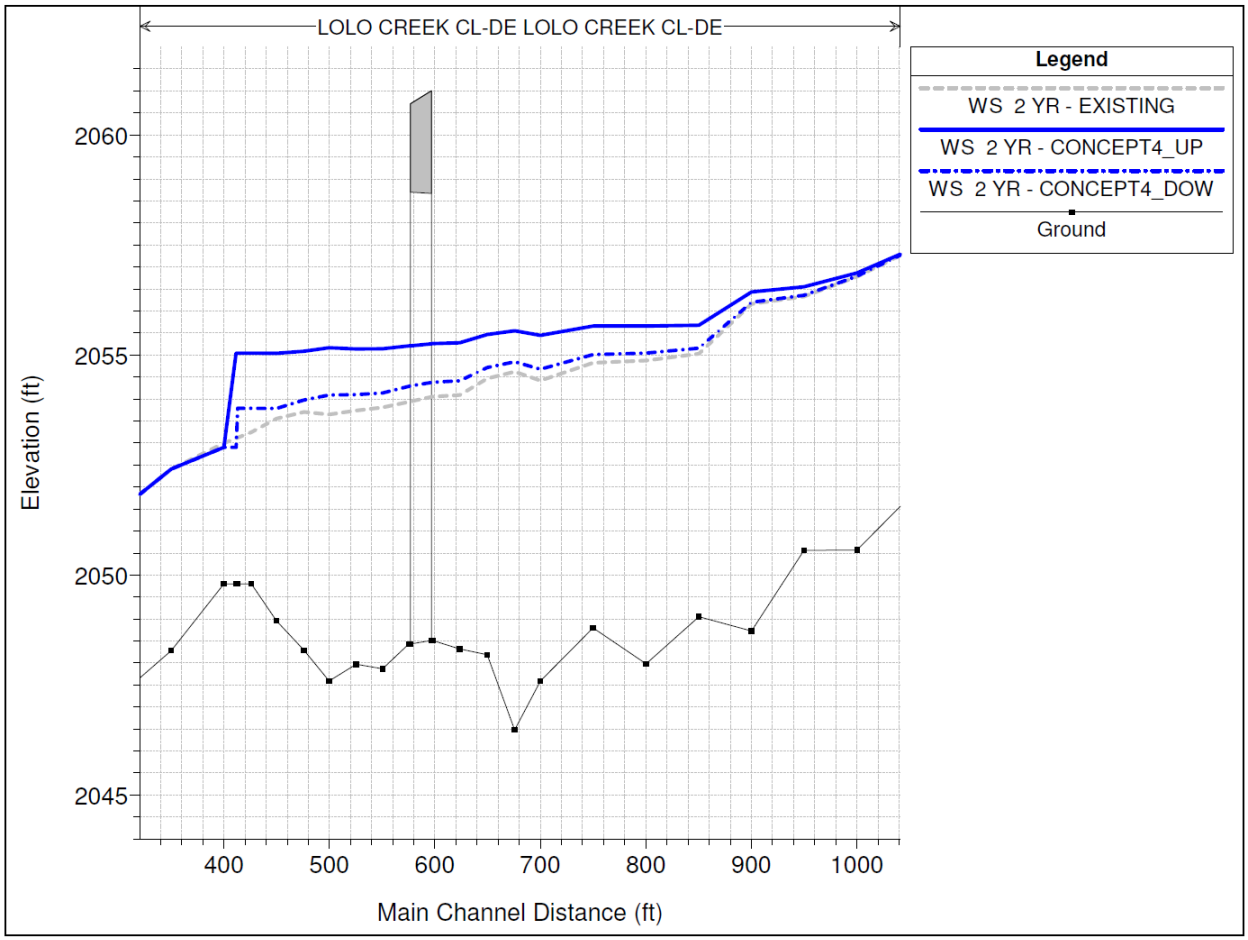

Figure 6. Comparison of existing surface water elevations (existing seasonal weir in place), 0% operations of new weir, and 100% operations of new weir. The gray box represents the existing Lolo Creek Road Bridge.

Water Quality

During operations, temporary increases in sediment may occur during the spring runoff period. During these high flow periods when the weir is raised, periodic lowering of the weir would introduce a temporary pulse of sediment as accumulated debris and materials pass downstream; however, the sediment plume would likely dissipate within a few minutes of weir lowering. High turbidity is an existing condition during high flow periods in Lolo Creek, and, with the exception of occasional weir lowering to flush accumulated sediments, instream turbidity should not increase compared to normal background levels during high flow events.

Instream construction would occur during periods of low flow when turbidity is at its lowest levels of the season. Although setting of the cofferdam and associated operation of construction equipment in the active channel would result in increased turbidity, the increase would be temporary and should not exceed 10% of background over a distance of more than 100 feet for greater than about 30 minutes. During construction, water quality would be protected through the use of work area isolation, and by use of erosion control measures to contain construction sediment from project components located above the OHWM. The following impact minimization measures would be implemented during construction of the proposed facility:

General Impact Minimization Measures

1. Use of sediment barriers such as fences, weed-free straw matting/bales or fiber wattles as necessary in all work areas sloping toward Lolo Creek to intercept any surface flow that might transport sediment to the stream channel.
2. Staging of construction equipment and materials would occur landward of the top of bank behind silt fencing that will designate grading and clearing areas. Although a larger distance is desirable, the nature of the construction area is highly restricted as a nearly vertical bedrock hillside parallel the right bank terrace where equipment would be staged. Staging elsewhere (i.e., along Lolo Creek Road) is not desirable and may not be permissible. To the extent feasible, machinery would be operated from the top of the stream bank along adjacent uplands and previously cleared areas.
3. Fuel storage and refueling would occur in the staging area, no closer than 35 feet from the creek. Fuel storage and refueling areas would be operated using best management practices (use of catch-basins, sediment berms) and would be equipped with an appropriate spill containment system. Absorbent pads to soak up leaks and a fuel spill response kit of appropriate size for the equipment used would be readily available throughout the construction period.
4. Dust abatement will include a water truck that applies water daily to the construction area.
5. Heavy equipment that may work below the OHWM would be washed before it is delivered to the job site.
6. Equipment would be inspected before use to remove vegetation and dirt clods that may contain noxious weed seeds.
7. Machinery would be inspected daily for fuel or lubricant leaks.
8. Excess excavated materials would be covered and stockpiled away from the creek and flanked with sediment fencing or fiber wattles to minimize opportunity for fine sediment to be transported into the creek. Following construction, surplus excavated materials would be transported off site to an approved receiving location to be determined by the contractor and approved by the Owner's inspector.

Instream Construction

1. In-water work is proposed to occur from August 1 through October 31. Although the instream work window established for this area by IDFG and NMFS is typically July 15 – August 15, in-water work associated with the project will likely require 8-10 weeks to complete. As such, the August 1 – October 31 window was recommended by Bob Ries (Ries 2010) to allow construction to be completed in one year. Average flows during this period are near base flow levels and would therefore facilitate cofferdam installation and removal. The effects associated with instream construction over two summers would likely be greater than those associated with a longer, single-season work period as proposed in this assessment.
2. Machinery for in-water elements would primarily be operated from the top of the stream bank along adjacent upland areas and excavation for installation of the weir abutments and trapping/holding facility would take place from the bank, or below the OHWM in the dry (since construction will occur during base flows) to the extent possible. During cofferdam installation, equipment may be driven in the flowing water. Given the predominant large cobble and bedrock nature of the substrate, and anticipated low flows during the beginning of the in-water work window, it is possible that equipment could operate atop gravel bars or bedrock. If possible, equipment will be located atop bedrock to the extent possible to limit substrate compaction during the placement of cofferdam materials. Following placement of the cofferdam, equipment will not be stationary and will not operate in the active flow. Cofferdam materials (ecology blocks, aqua bags or supersacks with visquene) would be placed by an excavator working atop bedrock/cobble

in the channel (to the extent possible) that retrieves materials from a stockpile on the top of bank.

3. All construction cofferdams would be removed from the creek by October 31; however, every effort will be made to complete in-water work as soon as possible. All major work, including concrete pours, would be completed by October 15.
4. Because flows typically rise in November, super-sack bags, if used, will be tethered together to prevent cofferdam failure in the event that high flows occur prior to the end of the in-water work window.
5. Hydraulically operated equipment that may work below the OHWM would be retrofitted with vegetable-based fluid in the hydraulic system.
6. Turbidity monitoring downstream of construction activities would occur as a condition of the 401 Water Quality Certification to be obtained for the project.

7. Existing riparian vegetation would be protected to the extent possible. Impacts to waters of the U.S. would be permitted as required under Section 404 of the Clean Water Act, as administered by the USACE. To minimize effects of ground disturbance during construction, weed-free straw matting, silt fences, or other materials would be used to reduce the opportunity for soil erosion into the stream channel. All disturbed areas would be revegetated upon project completion using native plant species. Some annual grasses may be used for short term erosion control and cover.
8. Diesel or electric sump pumps would be used if needed to capture seepage flow from cofferdam areas. If possible, leakage under the cofferdam would be captured from the internal upstream face of the cofferdam using a small caged pump or a trailer-mounted pump; water would be pumped to the downstream side of the cofferdam. This would effectively collect creek water prior to entry into the work area. Silt-laden seepage water that is not feasibly captured would be routed to a settling system prior to discharge back to the creek. Several options are available for settling.
9. A project biologist would be present during placement and removal of the cofferdams to ensure that minimization measures are implemented and that any site specific adjustments made during that phase of the project afford appropriate protection to ESA-listed species and their habitat.
10. A pollution and erosion control plan would be prepared and carried out by the Contractor to prevent pollution related to construction activities. The pollution and erosion control plan would address equipment and materials storage sites, fueling operations, staging areas, hazardous materials, spill containment and notification, and debris management.
11. Installation and removal of the cofferdams would be accomplished over several hours to allow streamflow to be reduced and rewatered gradually. Immediately prior to initiating construction activities, qualified NPT fisheries biologists would remove all fish species present from the immediate area where the cofferdams would be installed.

Navigation

The lower 10 river miles of Lolo Creek reportedly contain the best whitewater in the creek (American Whitewater 2006; BLM 1995, 2008). This section is directly accessible to boaters from the existing seasonal weir location. A map to the "Cottonwood Flats (near State Meadows) to Clearwater River" runable segment, provided on the American Whitewater website (2006), indicates that a put-in is located about 3 miles upstream of the existing weir location. However, the directions to the put-in and associated site description posted on American Whitewater (2006) appear to match the existing weir location, just downstream of the Lolo Creek Road Bridge.

Following the initial construction year, boaters that put-in at the weir site would be able to park their vehicles at the designated "boater" parking areas on the right bank, and enter the creek

downstream of the new weir at the put-in area (about 100 yards downstream of the bridge). For this reason, access to the "best whitewater" in the creek would not be negatively affected by operation of the new weir.

Access During Weir Construction

Access to the creek during the typical boat-able period (April through mid-July) of the weir construction year (2013) would be available since in-water work would not commence until August. However, parking may not be available at the site at all times since construction equipment would be staged along the right bank, and upland work may commence as early as April. This is an existing condition as boaters typically park just upstream of the bridge along Lolo Creek Road. Several put-in locations would be available on either bank until in-water work commences in August. It is unlikely that construction area would be accessible to boaters during the summer construction period due to potential public safety concerns at the active construction site. However, boaters do not typically run the creek during the instream work window (August – October) due to low flows.

To inform boaters of impending construction associated with the proposed action, particularly instream construction, project proponents (including the Contractor, BLM, NPT and BPA) would participate in a public outreach exercise. The BLM (Culver 2012) recommends posting information about the construction on Facebook pages including those of the NRS and Cascade entities. In addition, information would be posted in the local papers including Moscow and Missoula. Two newspaper postings would occur: 1) during April, when upland construction and staging at the site would commence, and 2) just prior to the start of the August 1 instream work window. Information to be posted in newspapers and websites would include construction schedule and timing, availability of parking, and inaccessibility of the creek from August through October of the construction year.

Access During Weir Operations

As stated above, the majority of boaters on Lolo Creek typically run the river between April and mid-July (BLM 1995; Culver 2011). Although many individuals reportedly enter the creek at the weir site, some may put-in further upstream of the site. These individuals would encounter the weir as they boat downstream. The seasonal weir has been present in the creek from mid-May through September for the past 10 years. As such, operation of the new weir from as early as mid-May through September would not result in a change in the navigational condition of the creek over those months. If boaters enter the creek at upper put-in locations (Cottonwood Flats and another location well upstream as mentioned in Amarel [1990]), they would be required to take out just downstream of the Lolo Creek Road Bridge (or upstream along the sandbar on land owned by the Idaho Department of Lands). This is an existing condition during the months of May through September (seasonal weir operational period).

If kayakers put-in upstream of the project location prior to the typical installation of the existing seasonal fish barrier (about mid-May), the permanent weir would constitute a new barrier compared to existing conditions. Kayakers would be required to take out upstream of the weir and walk their boats approximately 300 feet to the designated put-in area just downstream of the proposed permanent weir location. Compared to existing conditions, this would effectively result in a loss of about 100 yards of recreational boating opportunity (from the Lolo Creek Bridge to the kayak put-in area) from April to early May.

As stated above, for those recreational users that put-in at the project site, two parking spots would be designated in uplands immediately adjacent to the new put-in area to facilitate entry

into the creek. Considering the proposed designation of a kayak take-out just downstream of the bridge (warning signage on upstream face of bridge), a new kayak put-in area downstream of the new weir, and the creation of two dedicated parking spots onsite with signage, the loss of approximately 100 yards of boat-able creek is not considered a significant negative effect to the recreational ORV of Lolo Creek.

Alteration of Riparian and/or Floodplain Condition

Riparian Vegetation and Soils

The proposed project would take place within the channel and along the banks and riparian corridor of Lolo Creek. As such, infrastructure would modify the riparian and floodplain condition in the project area. Due to the degraded nature of the right bank flat and adjacent riparian corridor, construction of the fishway and trapping facility is not anticipated to increase the percent of bare ground or soil compaction in the project footprint. No changes to the percent bare ground or soil compaction are anticipated along the left bank since the only infrastructure proposed is the left bank abutment, which would be constructed in an area of the bank that is comprised of nearly vertical bedrock and large boulders.

The proposed fishway/trap and associated workup shelter and mechanical building would be constructed along the right bank in an area that has been historically disturbed and subject to fill. The right bank is devoid of all vegetation immediately downstream of the Lolo Creek Road Bridge (see photos in Appendix A). Further downstream along the bank, sandy soils and large cobbles support a fragmented riparian community dominated by an understory of reed-canary grass and scattered alder saplings. Considering existing conditions, the installation of right bank features would not result in a loss of riparian vegetation that is highly functional with regard to habitat or instream shading. A mature cedar that is located along the right bank downstream of proposed construction activities would not be disturbed due to this project.

Along the left bank in the vicinity of proposed weir abutments and wing walls, the bank is dominated by large boulders and vegetated bedrock outcroppings (see photos in Appendix A). The boulders form a steep bank landward of the creek, and the hillside is covered in moss and vegetation including trillium, moss, sword fern, maidenhair fern and western red cedar. It is likely that at least 2-3 mature cedars (~24-inch diameter) would be removed to install wingwalls and the left bank weir sill abutment. To mitigate for the loss of these trees, three cedars would be planted on the right bank downstream of the weir. Further, willow bundles would be installed along the right bank near the boater put-in area and in areas that are disturbed during construction.

Three small riverine wetlands are present in the project area (HDR 2011b). One narrow wetland along the right bank, portions of which are below the OHWM of the creek, would serve as the boater put-in location. As such, it would occasionally be traversed by boaters during put-ins. None of the wetlands delineated within the project area would be subject to the discharge of fill material or other construction-related disturbance.

Scenic Condition of Riparian Corridor

Construction of a concrete weir, fishway and trap would introduce new hardened features to the riparian corridor in the project area. To mitigate for potential impacts to the scenic ORV, the BLM will require that all concrete is colored to match the natural surroundings per Visual Resource Management (VRM) guidelines. The workup area and roof will be forest green or tan

(or other as determined suitable by the BLM), and the concrete will be tan or gray to blend with native river rocks and boulders to the extent possible.

The existing sight-line for the project area is very limited due to the canyon-like nature of the site. The existing seasonal weir facility and associated upland infrastructure along the right bank can only be seen once a vehicle turns a near 90-degree bend along Lolo Creek Road, just before the bridge crossing from the north. Dense forest and steep terrain visually screen the site from vehicles approaching from the south until one is nearly at the Lolo Creek Road Bridge. Given this limited sight-line, even with potential logging of the south hillside (future activity in project area not related to proposed action), the project site is relatively hidden in the canyon. Based on these characteristics, the visual impact of the proposed new facility would be minor and not result in significant adverse effects to the scenic ORV.

Floodplain Properties

The proposed buildings associated with the weir facility would be constructed on the right bank of the creek in the floodplain. The floor elevations of these structures are set such that they would only overtop during a 10-year recurrence flood event. Above this elevation, many of the structures near the river employ open framing construction that decreases potential obstruction and allows flood flows greater than the 10-year recurrence access to overbank areas. In addition, the channel width over the weir (75 feet) conforms with natural channel widths measured above and below the project reach. Therefore, these structures would minimally affect the geometry of the floodplain. Fill material would be imported and graded to elevations necessary to ensure the stability of the structures.

In-Channel Conditions

The concrete weir sill would alter approximately 70 ft of the creek roughness at the project site. Bank protection would be constructed as an additional measure against bank erosion. There would be minimal effects to debris loading, amount or timing of flow, existing flow patterns, subsurface flow characteristics, flood storage and aggradation/degradation in the channel. Water surface elevations are expected to increase slightly after construction of the weir facility; however, such increases would not affect stream flow function or habitat to a degree that would alter use by aquatic species. Many of these factors are also addressed in more detail in previous sections of this report (see the *Alteration of Within Channel Conditions* section).

Alteration of Upland Conditions

Position of Activity in Uplands and Modifications to Upland Vegetation and Soils

Project elements proposed to be sited in uplands are relatively limited (workup shelter, concrete pad for skid-mounted generator; vaulted toilet), and would not result in significant changes to the existing upland condition onsite. All vegetation removal along the right bank would occur along the riparian corridor below the OHWM (see photos in Appendix A). The vast majority of uplands landward of the OHWM along the right bank have been previously cleared of native vegetation and consist of herbaceous weedy species typical of disturbed areas, as well as hard-compacted access areas that have been filled and are seasonally-occupied by NPT staff trailers and staff vehicles. Because the right bank flat is currently used for vehicular parking, fish haul truck turn-around and trailer placement, fill associated with project development would not adversely affect the already-degraded upland soils.

Changes in Upland Conditions that Would Influence Cultural Resources

The NPT will conduct a cultural resources survey on the site in the spring of 2012. This survey will include archaeological data pits, and findings will be presented in a report submitted to the Idaho State Historic Preservation Office (SHPO). Due to the presence of previously-placed quarry fill material associated with development of the seasonal weir facility and historic recreational use of the site, the archaeological condition of the site is currently degraded. However, the project will not proceed until consultation is completed with the SHPO as required under the National Historic Preservation Act (NHPA). All archaeological and historic resources at the site, including the Lewis and Clark Trail and Nez Perce Trail, will be catalogued in the report, and appropriate mitigation will be implemented to ensure compliance with the NHPA.

Alteration of Hydrologic or Biological Processes

The following section summarizes the anticipated alteration of hydrologic and biological processes as a result of the proposed project.

Hydrologic

Ability of the channel to change course, re-occupy former segments, or inundate its floodplain

Anticipated impacts related to channel migration, re-alignment, or floodplain inundation are addressed in previous sections of this document (see the *Alteration of Within Channel Conditions* section).

Streambank erosion potential, sediment routing and deposition, or debris loading

This project is not anticipated to result in any issues associated with stream bank erosion, sediment routing, sediment deposition, or debris loading. Affects of project implementation are discussed throughout various sections of this report (see *Alteration of Within Channel Conditions and Alteration of Riparian and/or Floodplain Conditions* sections). In general, impacts associated with construction of the proposed facility would result in minor upstream aggradation of sediment, increases in velocity over the weir, and decreases in velocity upstream of the weir. Due to the presence of the bridge structure, it is anticipated that excess accumulation of bedload upstream of the weir would be mobilized and that a relatively limited accumulation of material would remain. A natural equilibrium should develop within the first year of operation such that sediment routing process would not be affected. Given that the picket weir would be lowered during events lower than the 2-year flood recurrence, larger events would continue to transport bedload and sediment downstream. Other areas where increased velocities are anticipated would be mitigated with scour countermeasures (buried large rocks) that would act as bed profile control as well as bank protection that would prevent any instability. Primarily, these areas occur immediately downstream of the concrete weir as well as downstream of the proposed concrete trapping structure.

Existing Flow Patterns Including Surface and Subsurface Flow Characteristics

Anticipated impacts to existing flow patterns and surface flow characteristics are discussed in previous sections of this document (see the *Alteration of Within Channel Conditions* section).

The project would not result in any alterations to the amount or timing of flow in Lolo Creek. Lolo creek would retain its free-flowing condition subject to natural variation in the annual hydrologic and climactic regime. Water routed through the proposed fish ladder inlet would be

discharged immediately downstream of the proposed weir resulting in a no net loss of flow within Lolo Creek.

Flood storage (detention storage)

Anticipated impacts related to floor storage or detention is addressed in previous sections of this document (see the subheading *Backwatering* in the *Alteration of Within Channel Conditions* section).

Biological

Due to the relatively degraded condition of riparian habitat in the vicinity of proposed right bank infrastructure (fishway and trap), removal of vegetation is not likely to result in a measurable loss of instream shading in rearing habitat. Along the left bank in the vicinity of proposed weir infrastructure, a minor loss of instream shading along the left bank is expected due to the loss of several large conifers; however, numerous mature cedars are present on the hillside within 100 feet of the OHWM that currently provide instream shading. As such, the loss of several trees immediately adjacent to the water is not likely to result in a measurable increase in instream temperature, or a significant loss of large woody debris recruitment in the project area.

During instream construction, direct effects to fish could include displacement or disturbance of individuals, and exposure to sediment, petroleum products and uncured concrete. Under normal flow conditions, rearing habitat may degrade due to sediment accumulation and reduced velocities. Sedimentation would be mitigated by the lowering of pickets during high flows to flush accumulated materials behind the weir. Only under extreme dry conditions would the new facility significantly impact instream rearing habitat.

Construction of the facility would result in a permanent loss of 2,651 square feet of rearing habitat in the project area, primarily along the right bank. However, this rearing habitat is degraded and lacking functional riparian vegetation. Two large instream boulders would be removed. These boulders may provide cover and velocity refugia for juvenile salmonids. No other habitat refugia would be lost as there are no logs, instream vegetation, back-eddies or overhanging banks present in the construction footprint.

Alteration of instream morphology and habitat due to backwatering of the river behind the weir may modify small pockets of potential shallow rearing habitat that may be used by rearing juvenile fish. However, since there is ample rearing habitat available in the vicinity of the project area, this modification is not likely to have measurable long term impacts to fish species.

Potential project effects to ESA-listed fish are discussed thoroughly in the Endangered Species Act (ESA) Section 7 Consultation document prepared for this project (HDR 2012). The effects presented for ESA-listed steelhead and bull trout are applicable to most aquatic species that occur in the project area. Although construction and operation would result in a minor loss of habitat in the project area, operation of the new weir would enable the NPT to collect information on the ESA-listed Lolo Creek steelhead population, which would inform recovery efforts in the watershed.

Magnitude and Extent of Potential Off-Site Changes

During operational flows when the weir is raised, minor modifications to the hydrologic regime and sediment transport due to backwatering upstream of the weir would be measurable to approximately 640 feet upstream of the proposed weir location. Instream flow and habitat

modifications as related to hydraulics were summarized for different flow scenarios above under the "Hydrologic" heading, above.

Time Scale

Short-term effects identified in this analysis consist of increased sedimentation due to bed and bank excavation associated with installation of the new weir and fishway. Short-term sedimentation would be minimized by the placement of sediment minimization measures, work area isolation structures, and would be limited to the 90-day instream work window authorized by NMFS, USFWS and IDFG. This work window has been selected to minimize impacts to ESA-listed steelhead in Lolo Creek. Due to the large cobble and boulder nature of the substrate and the low flows during the instream work window, sedimentation is expected to be minor.

Long-term effects in the project area include minor backwatering upstream of the weir during operations, particularly during high flow periods. These effects would be persistent over the life of the project. Backwatering would result in sediment accumulation upstream of the weir over the life of the project; however, the weir would be lowered periodically to flush accumulated sediments. Backwatering during higher flow events would also increase the wetted width of the channel upstream of the weir facility; however, this may slightly increase the availability of lower velocity rearing habitats for small fish.

Compare Project Analysis with Management Goals

The *Approved Cottonwood Resource Management Plan* (BLM 2009) and Appendix K of the *Final Draft Wild and Scenic Rivers Eligibility and Suitability Study* were reviewed to determine project consistency with management goals relative to Lolo Creek's preliminary designation under the NWSRS. The approved RMP (BLM 2009) states that the BLM will adhere to the following guidelines on river reaches, including the Lolo Creek, which have been deemed preliminarily suitable for designation under the NWSRS:

1. Approve no actions altering the free-flowing nature of the suitable segment through impoundments, diversion, channeling or installing riprap
2. Approve no actions that will measurably diminish the stream segment's identified ORVs
3. Approve no action that will modify the setting or level of development of the suitable river segment to a degree that will change its identified Scenic classification.

Regarding guideline #1, similar to the existing seasonal picket barrier, the proposed fish weir is a flow-through structure that would not significantly impound water upstream, though some minor, backwatering would occur during higher flow events. However, this would not alter the free-flowing nature of the system as the same quantity of water would continue to flow downstream through the structure at a similar velocity compared to existing conditions. The installation of minor amount of large rocks (from a BLM-approved source) along the right bank infrastructure is intended to protect the facility and prevent bank scour and erosion. These rocks are also intended to soften the visual impact of the concrete retaining wall, which would form fishway and trapping facility. These rocks would not protrude into the channel, and would therefore not alter the free-flowing nature of the creek. During low flow events, the majority of flow would be routed through the right bank fishway or low flow notch. This is similar to existing conditions where flow travels through the creek's thalweg, and should not alter the free-flowing nature of the reach.

Regarding guideline #2, an analysis of the effects to individual ORVs is presented under the "Determination" section, below. In summary, in consideration of the project setting, existing conditions (i.e., seasonal weir facility in place), and proposed mitigation measures, the proposed action would not measurably diminish the scenic, recreation, fish or historic ORVs of the creek.

Regarding guideline #3, in consideration of the canyon-nature of the site, existing conditions (seasonal weir in place), the limited sight-line, and proposed mitigation measures, the development of a permanent weir facility should not modify the setting or level of development to a degree that would change the Scenic classification of the reach.

In addition to the Cottonwood RMP, this project complies with recommendations of the Northwest Power and Conservation Council's (NPCC) Fish &Wildlife Program. The Northwest Power Act directs BPA to use funds to protect, mitigate, and enhance fish and wildlife resources affected by hydropower dams in a manner consistent with the program developed by the NPCC. The proposed project is consistent with steelhead monitoring goals established by NMFS. As previously stated, NMFS identified Lolo Creek as a watershed in need of monitoring for Snake River B-run steelhead populations (*Recommendations for Implementing Research, Monitoring and Evaluation for the 2008 NMFS Federal Columbia River Power System Biological Opinion*). Additionally, on-going fish trapping conducted by the NPT at the project site has indicated that spring Chinook salmon abundance in Lolo Creek is very low. To supplement spring Chinook populations in Lolo Creek, the NPT currently conduct monitoring and evaluation studies and collect adults for use as broodstock at the NPTH. The proposed action would allow for improved monitoring and collection of spring Chinook by the NPT, and would be capable of operating during high-flow periods in the months of April and May when the existing seasonal weir cannot be installed.

Determination

Free-Flowing Conditions

The existing NPT seasonal fish weir was considered in the W&S suitability analysis for Lolo Creek. The BLM (2008) stated that, "during operation, the weir does not affect the amount of water passing downstream but constricts flow to allow operation of the trap." The new weir would operate over a longer period, but would similarly not affect the amount of water passing downstream. There would be no damming or diversion of waters as the weir would essentially operate as a run-of-the-river facility. During low flow conditions, and similar to current seasonal weir operations, flow would be constricted along the right bank to operate the trap and fish ladder.

In summary, the free-flowing condition of the river would not be altered by the proposed action, though the new weir would operate over an extended period compared to the existing seasonal facility. When flows exceed the maximum operational flow of 2,000 cfs, the pickets would be lowered to protect the structure and minimize backwatering upstream of the weir. While lowered, the creek would flow directly over the weir, though the fishway and weir abutments would constrict the river slightly.

Water Quality

With regard to water quality during construction, the effects of this project would be minimal considering the implementation of impact minimization measures described above. Frequent lowering of the weir would flush accumulated sediments downstream during high flow events.

Backwatering upstream of the weir during operations should not cause bank erosion since banks are stable in the upstream reach.

During construction, turbidity would be monitored at a station downstream of the instream work area to evaluate levels. The current Idaho water quality standard (stipulated under Section 58.01.02.250.02 (e) of the Idaho Water Quality Standards) to protect cold water aquatic life states that turbidity below any applicable mixing zone should not exceed background turbidity by more than 50 Nephelometric Turbidity Units (NTU) instantaneously or more than twenty-five (25) NTU for more than ten (10) consecutive days (IDAPA 2011). If turbidity monitoring during construction determines that state standards are exceeded, construction would stop until levels are compliant with standards.

Outstandingly Remarkable Values

As stated in Appendix C ("Direct and Adverse" evaluation protocol) of the Interagency Wild and Scenic Rivers Coordinating Council's *Wild and Scenic Rivers Act: Section 7* technical report (USFS 2004), "the responsible official should make a conclusion as to whether the project as proposed will result in "direct and adverse effects" to the values for which the river was added to the National System." In addition the Cottonwood RMP (BLM 2009) under Objective WR-1.2, the BLM will "approve no actions that will measurably diminish the stream segment's identified outstandingly remarkable value(s)."

Lolo Creek ORVs include scenic, recreation, fish and historic. The following text summarizes anticipated effects and proposed mitigation measures for each ORV. In addition, the following text concludes whether anticipated effects would be "direct and adverse" per USFS (2004), and whether actions would "measurably diminish" Lolo Creek ORVs per Objective WR-1.2 of the Cottonwood RMP (BLM 2009).

Scenic

The Lolo Creek Road Bridge, NPT seasonal weir and juvenile screw trap were present during the suitability determination for Lolo Creek under the NWSRS. The right bank of the creek in the project area has been cleared of riparian vegetation and seasonally houses NPT work trailers and portapotties, and staff vehicles and fish haul trucks are often present. As such, the existing scenic values at this location are somewhat degraded compared to other undeveloped portions of the creek. Under the proposed action, scenic values would be altered slightly compared to existing conditions due to the presence of permanent weir infrastructure. However, the gradient of the creek would not change significantly, and with the exception of the concrete sill and weir structure, there would be relatively no change to the hydrologic scenery present on site.

Given the limited sight-line, the degraded character of the right bank, and the seasonal presence of existing weir infrastructure, the proposed project impact on the scenic ORV is expected to be minor in nature. Proposed actions would not measurably diminish this ORV. Further, approval of this project would not modify the setting or level of development of this segment of Lolo Creek to a degree that would change its proposed Scenic classification.

Although Lolo Creek is not congressionally designated under the NWSRS or a congressional authorized study area, the Team concluded that proposed actions would not result in direct or adverse effects to this ORV. This represents a provisional determination pursuant to Appendix C guidelines of the *Wild and Scenic Rivers Act: Section 7* technical report (USFS 2004). The project will adhere to the BLM's VRM Design Techniques (BLM 2007) for new the mechanical building and workup shelter. New concrete will match riverbed substrate and the color palette

will consider the VRM's Standard Environmental Color Chart (BLM 2007). These techniques should also minimize the potential for adverse effects to the scenic ORV.

Recreation

The public swimming area upstream of the Lolo Creek Road Bridge would not be affected by the proposed action. Recreational swimmers that frequent the creek in the summer months generally occupy waters upstream of the Lolo Creek Road Bridge. The existing Lower Lolo Weir has been in place for over 10 years and as such, if recreational swimmers float the creek downstream, they would not encounter a new barrier compared to existing conditions.

Relative to whitewater use at the Lower Lolo Weir site, the proposed action would extend the fish collection and monitoring period into the spring runoff period. This is a change in project operational timing compared to existing conditions. The current seasonal weir is not typically installed until mid-May or early June. However, the new weir would operate from as early as January through September. As such, individuals running the creek would likely encounter the barrier during the typical boating season, unless the weir was lowered for steelhead kelt passage, sediment flushing, or prohibitively high flow conditions.

To mitigate for the loss of about 100 yards of boating opportunity at the weir location (from the bridge to the downstream put-in), the project would maintain the existing take-out/landing immediately downstream of the bridge. Project proponents would affix a sign on the upstream face of the bridge to warn boaters of the impending downstream barrier and right bank take-out, and to indicate that portage is required. Coordination with land owners would occur to determine if similar signage could be installed at the upstream put-in at Cottonwood Flats. The placement of boater warning signage on Lolo Creek Road Bridge requires coordination with the Clearwater Highway District and Idaho County, as co-owners of the bridge. Both entities have agreed to allow such signage (Gangewer 2012; Meinen 2012). The project would also incorporate two designated parking spaces for boaters near the downstream put-in (downstream of the weir on right bank, see Figure 4).

In addition, the NPT would upload flow data from the recently-installed pit-tag detection system, located 150 feet downstream of the Lolo Creek Road Bridge. This data would be available for public viewing on a website to be established and maintained by the NPT. The website would provide real-time data on a satellite uplink so that boaters can view flows online prior to traveling to the site. Considering these mitigation actions, no measurable diminishment of the recreational ORV is anticipated due to the project. Prohibiting access to about 100 yards of river for boating/kayaking is not considered a significant adverse effect to this ORV.

As stated above, during extreme low flow periods (under 10 cfs), all flow would pass through the fishway or low flow notch. This would allow continued fish passage around the sill. During these relatively rare low flow periods (August/September), boating the creek is not possible at the weir site, so this low flow passage mechanism should not affect recreational boating use.

Based on the information presented above, the Team concluded that proposed actions would not result in direct or adverse effects to this ORV (provisional determination), and would not measurably diminish this ORV.

Fish

The objective of the proposed action is enable the continued collection of spring Chinook for supplementation in the basin, and to implement a monitoring program for ESA-listed Snake River steelhead in Lolo Creek. Because steelhead migrate and spawn during period of high

flow/turbidity, population information is severely lacking. As such, NMFS has requested that this population be monitored to gain information relative to run timing and population status in the watershed. This would indirectly benefit this listed stock by providing valuable information about life history and use of the system. As such, ORVs related to federally-listed steelhead would benefit from the proposed action. Non-target fish species would experience a temporary delay in their upstream migrations once they enter the trap, but all fish would be passed upstream within 24 hours of trapping during the operational period.

An in-depth analysis of anticipated effects to ESA-listed fish, including bull trout and steelhead, is presented in the Biological Assessment (BA) prepared for this project (BLM 2012). The BA was prepared cooperatively with NMFS and the USFWS and agreement was reached on the analysis and determinations. The BLM has submitted the final BA and has requested consultation with the Services (Biological Opinion). The concluded effect determination for bull trout and steelhead, relative to Section 7 ESA guidelines, was "likely to adversely affect". These determinations are based on the potential for take due to handling during construction dewatering and migratory delay and handling at the weir during weir operations. Relative to scientific monitoring at the weir, take associated with handling of bull trout (*Salvelinus confluentus*) would be covered under an existing federal permit issued to the NPT for research in the Clearwater Basin (see Appendix D). The NPT currently holds an ESA Section 10 Scientific Research Permit authorizing the take of Snake River steelhead (*Oncorhynchus mykiss*) associated with operation of NPT steelhead and spring/summer Chinook weirs in the Clearwater Basin, including Lolo Creek (Permit No. 1339-3R; see Appendix E). These authorizations would therefore cover handling/holding/harassment of ESA-listed bull trout and Snake River steelhead at the proposed weir.

The project Environmental Assessment (BPA 2012), prepared in fulfillment of requirements under the National Environmental Policy Act (NEPA), presents a summary of anticipated effects to fisheries resources in the creek, including ESA-listed and sensitive species, as well as BLM-sensitive species.

Based on the information presented above, the Team concluded that proposed actions would not result in direct or adverse effects to this ORV (provisional determination), and would not measurably diminish this ORV. Although individual ESA-listed fish would experience migratory delay and be subjected to handling at the weir site, these effects would be authorized under the ESA.

Historic

A cultural resources survey and associated report will be completed by the NPT cultural resources staff in spring/summer of 2012. Pre-survey coordination with the BLM archaeologist and BPA has been conducted. The report will be submitted to the SHPO, and the project will not be implemented until the SHPO issues a cultural resource concurrence letter. Upon completion of the SHPO consultation and required mitigation, if any, the proposed action is not anticipated to result in negative effects to this ORV. The BLM proposes to place an interpretive panel at the site during operational periods to inform the public of historic use of the site as well as on-going NPT fish collection and monitoring activities at the weir.

Based on the information presented above, the Team concluded that proposed actions would not result in direct or adverse effects to this ORV (provisional determination), and would not measurably diminish this ORV.

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Appendix A

Project Photographs

(Refer to Appendix A of EA for Project Photographs)

Appendix B

Hydraulic Report

Technical Memorandum

Evaluation of Existing and Proposed Hydraulic Conditions at the Lolo Creek Satellite Facility

Prepared for:

Bonneville Power Administration

Nez Perce Tribe Treaty of 1855

Prepared by:

HDR Fisheries Design Center

July 2011

Table of Contents

1 Introduction 2
1.1 Purpose 2
1.2 Scope of Document 2
2 Existing Conditions 4
2.1 Project Location and Access 4
2.2 Watershed and Basin Characteristics 4
2.3 Period of Migration 6
2.4 Project Survey Data 6
2.5 Hydrology 8
2.5.1 Development of Adjusted Flows from USGS Gage 8
2.5.2 Flow Duration of Mean Daily Flows 8
2.6 Flood Recurrence 10
2.7 Selected Flows for Further Evaluation and Design 12
3 Existing Hydraulics 12
3.1 Existing Geometry 12
3.2 Existing Manning's n Roughness Calculations 14
3.3 Boundary Conditions 14
3.4 Comparison to Observed Water Surface Elevation 14
3.5 Results 16
4 Proposed Hydraulics 21
4.1 Proposed Geometry 21
4.2 Proposed Manning's n Roughness Calculations 21
4.3 Boundary Conditions 21
4.4 Results of Proposed Conditions Hydraulic Calculations 24
5 Evaluation of Hydraulic Impacts 33
5.1 Impact to 100-YR Flows 33
5.2 Impact during Operational Flow 36
5.3 Effects of Proposed Activity 41
6 Summary 41
7 References Cited 45
Appendix A: Manning's n Calculations 1

1 Introduction

BPA and the Nez Perce tribal nation has retained HDR to design, permit, and manage construction of the Lolo Creek fish collection facility (Project). The proposed Lolo Creek fish collection facility (Facility) will include an in-channel picket weir barrier system which will span the width of Lolo Creek and will be accompanied by various fish ladder, trapping, work-up, and collection elements. The purpose of the Facility is to monitor and evaluate adult returns for steelhead trout and spring Chinook as well as to collect Nez Perce Tribe spring Chinook broodstock and supplementation evaluation data. The new facility offers greater functionality over a broader range of stream flow conditions, ultimately improving the ability to monitor steelhead and spring Chinook populations and collect supplemental broodstock for hatchery operations. This proposed Facility will replace the existing temporary picket weir that must be installed and removed each season when stream flow conditions are safe for workers (i.e. typically under 500 cfs).

As part of the initial design activities for this Project, stream flow hydraulics were evaluated to gain a greater understanding of both existing and proposed hydraulic conditions throughout the proposed Facility site. This technical memorandum presents the methods and findings developed during the hydraulic evaluation.

1.1 Purpose

The purpose of this technical memorandum is to document calculations and data resulting from the evaluation of existing and proposed hydraulic conditions associated with implementation of the proposed facility. This information is intended to be used by the design team to accomplish the following goals:

- Provide key hydraulic parameters which will be used by the HDR design team to configure elements of the final Facility,
- Investigate and align key operational parameters with respect to fish collection, safety, and the potential for flooding,
- Evaluate the anticipated level of impact to water surface elevations upstream of the proposed Facility, and
- Address the potential for other reach oriented impacts which may affect habitat and the free-flowing nature of Lolo Creek which has recently been designated as “Wild and Scenic,” by the US Bureau of Land Management (BLM).

1.2 Scope of Document

The work performed during preparation of this document is summarized in Table 1.

Table 1. Scope of work associated with the preparation of this document.

Task	Description
Site Survey	A site survey was conducted along Lolo Creek to capture existing overbank topography and stream bathymetry upstream and downstream of the proposed project site. Significant features were designated on the resulting survey information.
Site Reconnaissance	A site reconnaissance was performed by the design team to collect information pertinent to the design and modeling of the weir facility. Numerous photographs were collected to document important characteristics of the site.
Development of Hydrology	The annual instantaneous peak discharge and mean daily discharge values were acquired from the Lolo Creek near Greer, ID USGS Gage No. 13339500. Mean daily data were also obtained from a gage operated by the Nez Perce Tribe and located at the Lolo Creek Bridge within the proposed project reach. Values from the USGS gage were revised to account for a reduced basin area and compare to local gage data. The probability of annual recurrence as well as mean daily exceedance was then estimated.
Model Development	A one-dimensional HEC-RAS hydraulic model was developed to reflect existing conditions. Model results were compared to observed water surface elevation data collected during the site survey as well as from periodic flow measurements performed on-site by the Nez Perce Tribe. A second HEC-RAS geometry configuration was developed to reflect the anticipated proposed Facility conditions developed during the preliminary design stages.
Estimate Existing and Proposed Hydraulics	Estimates of water surface elevation and average velocity throughout the subject river reach were calculated using existing and proposed HEC-RAS model runs. The final HEC-RAS model was then used to evaluate hydraulic conditions and identify key design parameters.
Evaluation of Hydraulic Impacts	Results from the existing and proposed model runs were compared to evaluate the potential for impacts to existing water surface elevations and velocities upstream of the Facility. Deviations from existing conditions were noted and analyzed.
Determination of Key Design Parameters	Additional results obtained from the hydraulic calculations were used to identify key parameters which were to be used during design and operation of the Facility.
Summary of Results	Conclusions resulting from the activities conducted in preparation of this report are summarized. Key parameters are noted for use in development of a final design.

2 Existing Conditions

The following section describes the existing features and characteristics of the Facility site which pertain to the evaluation of local stream hydraulics. The existing conditions were used as a baseline in model development and during comparison of existing and proposed hydraulic conditions.

2.1 Project Location and Access

The project is located at approximately River Mile 11.9 on Lolo Creek near Wieppe, in Idaho County, Idaho. The Facility site can be accessed by traveling south from Weippe on Cemetery Road to Fidler Road. From Fidler Road follow 3 Mile Road to Lolo Creek Road. Lolo Creek Road passes over the Lolo Creek Bridge, which is adjacent to the project site.

2.2 Watershed and Basin Characteristics

The total Lolo Creek basin area which contributes runoff to the Facility location is approximately 202 square miles and is 84% percent forest. Vegetation at the project site consists of both evergreen and deciduous trees and various types of shrubs and grasses. Elevations at the project site range from approximately 2040 ft to 2085 ft. Refer to Figure 1 for a map of the project location and watershed area.

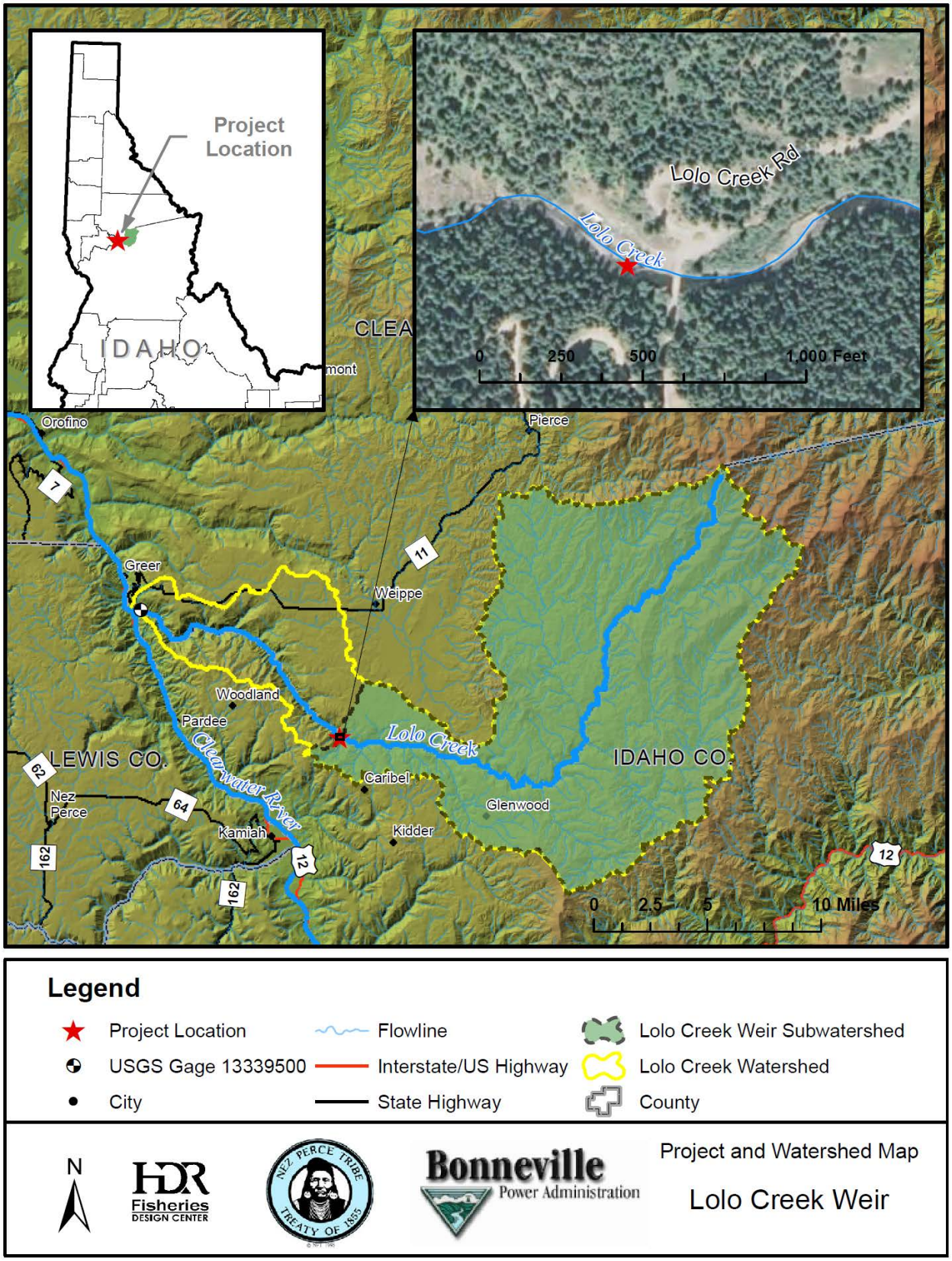

Figure 1. Project location and watershed boundary showing contributing basin area.

2.3 Period of Migration

Currently, the existing facility is only in operation from mid-May through September and during that time spring Chinook adults are collected. For modeling purposes, the period of January to September was used for migration flows.

2.4 Project Survey Data

Overbank topography, river bathymetry and site mapping was performed by H2 Surveying, Hayden, Idaho in October 22, 2010. Survey data are referenced to the Idaho West State Plane Coordinate System. The vertical datum is assumed as NAVD 88.

Base survey data used for the model development is from five surveyed cross sections and a Triangular Irregular Network (TIN) prepared by the surveyor. The site layout and hydraulic basemapping information is shown in Figure 5. From this figure, the proposed location of the Lolo Creek Satellite Facility passage barrier is located at approximately station 4+13 of the main channel alignment. The overall project reach of interest is approximately 1,158 ft. The last two cross sections were eliminated from the model due to a lack of data in the region.

A vertical profile of the Lolo Creek thalweg throughout the project reach is shown in Figure 2. The reach has an average slope of 1.0 % with a beginning elevation of 2041.33 ft and an ending elevation of 2053.12.

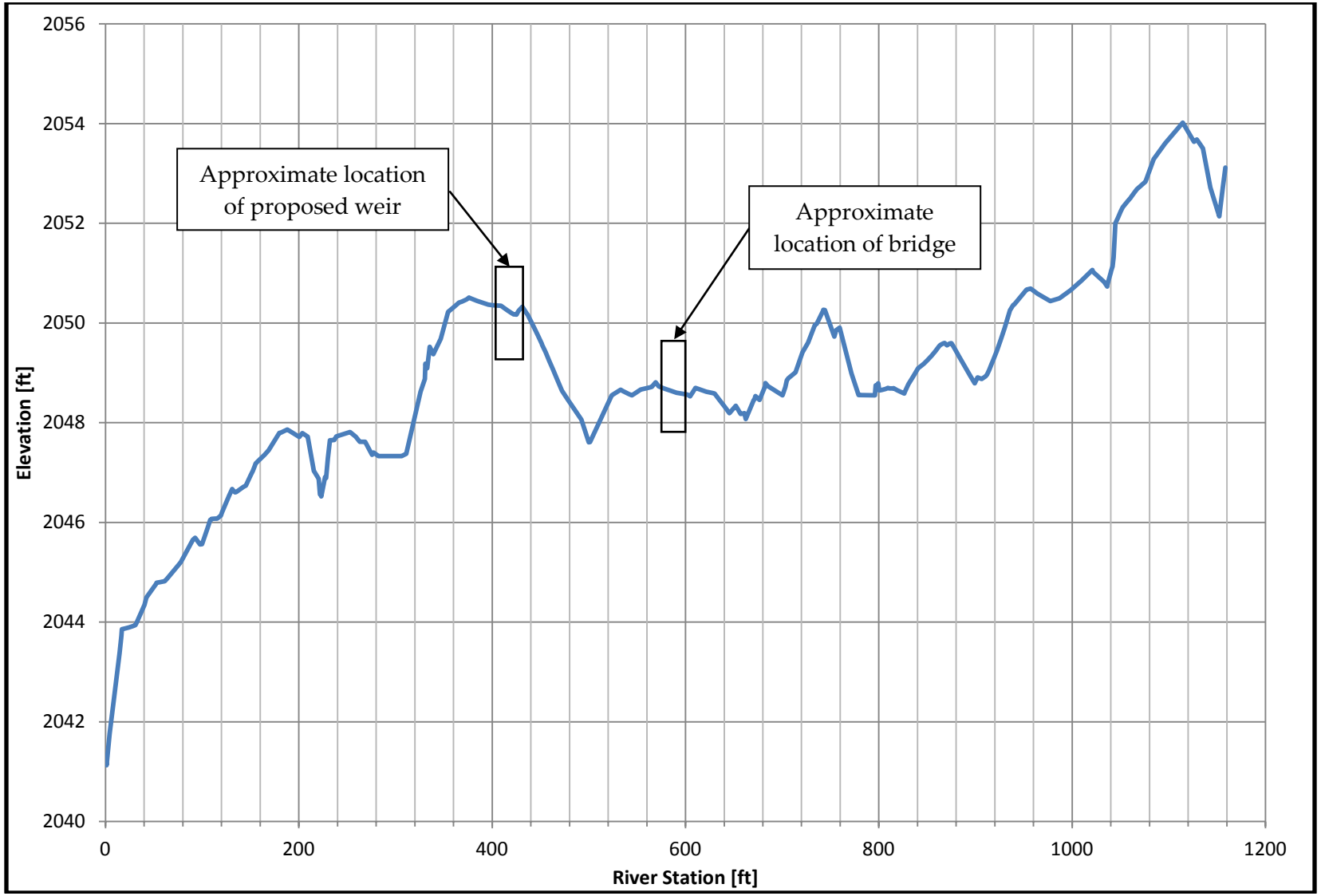

Figure 2. Thalweg profile throughout project reach.

2.5 Hydrology

Hydrology for the project reach was characterized by evaluating both mean daily and annual instantaneous peak flows. Recorded flow data was obtained from two sources: the USGS gage located along Lolo Creek near Greer, Idaho (#13339500); and from the local gage located at the Lolo Creek Road Bridge. The USGS gage has a recorded contributing basin area of 241 square miles, and has mean daily flows and annual instantaneous flows from 1980 to 2010. The local gage is managed by the Nez Perce Tribe to provide mean daily flows for a period of record extending from 2005 to 2009.

2.5.1 Development of Adjusted Flows from USGS Gage

A weighted basin area reduction ratio calculation was performed using the USGS gage #13339500 data to estimate flows at the project site. The USGS gage data was used in this calculation due to the extensive period of record compared to the local gage data period of record. Using the longer period of record provides a more accurate assessment of flow behavior throughout Lolo Creek.

2.5.2 Flow Duration of Mean Daily Flows

The probability of exceedance flows were calculated for the migration period of January 1 to September 30. The probability of exceedance was determined by calculating the percentiles from 1% to 99% for flows for the period of record. The probability of exceedance is the inverse of the percentile (e.g. the 1% percentile is the 99% probability of exceedance). This calculation was performed for both the adjusted USGS gage data and the local gage data.

The resulting discharge versus exceedance relationship is presented along with the USGS and local gage data for comparison in Table 2 and Figure 3.

Table 2. Comparison of USGS gage data, local gage data and the calculated probability of daily exceedance discharge values.

Percent Exceedance	Migration Mean Daily Flow [cfs]	
	Modified USGS Data	Local Gage
5%	1,020	1,166
50%	195	172
95%	27	14

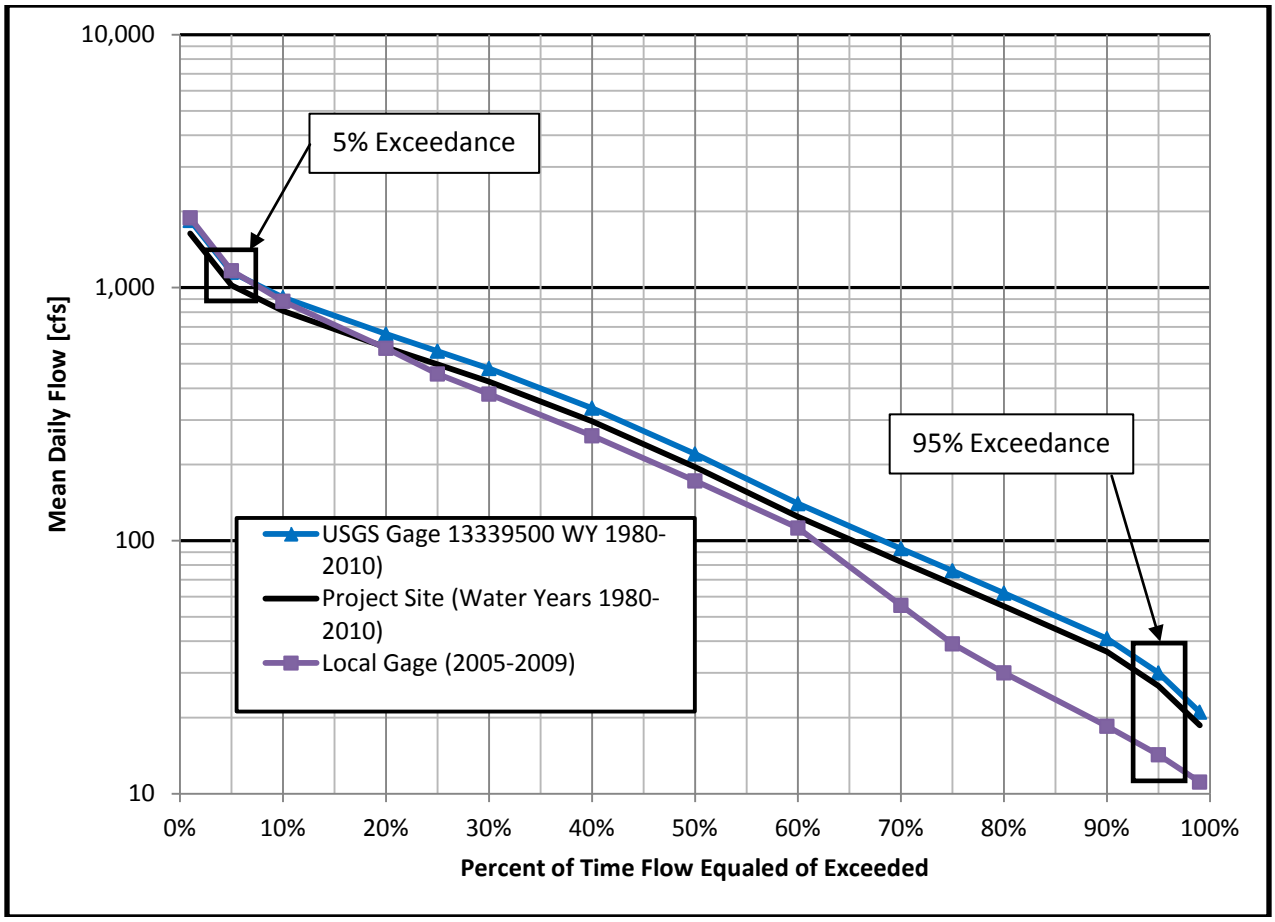

Figure 3. Comparison of flow duration curves in Lolo Creek during migration (January 1-September 30).

From the results presented, it can be seen that at the 95% exceedance discharge at the local gage is 14 cfs while the adjusted discharge is 27 cfs. At the 5% exceedance discharge, the local gage discharge is 1166 cfs, while the adjusted discharge is 1150 cfs. Due to the long period of record for the USGS flow data and the similarity of the results, it was determined that the local gage values can be confidently used for modeling purposes.

Peak flows in Lolo Creek coincide with snowmelt and typically occur from April through early July. Flows decrease during late July and August, with base flow levels normally reached by September and remaining through February. In 2005, the Nez Perce Tribe installed a flow gage on the Lolo Creek Bridge, just upstream of the temporary weir location. The highest mean daily flow recorded at the local gage (period of record from March 16, 2005 to November 24, 2009) was 2,803 cfs occurring April 2006. The lowest mean daily flow recorded at the local gage during the same period of record was 9.3 cfs, occurring in September 2006. By scaling instantaneous peak flows recorded at USGS gage ID 13339500 (period of record February 17, 1981 to June 3, 2010) to account for the smaller contributing watershed at the Lolo Creek project site, instantaneous peak flows could have reached magnitudes close to 5,910 cfs in February of 2003. On February 2, 2011, the local gage recorded a peak flow close to 6,200 cfs. Table 3 depicts

average monthly flows in Lolo Creek as measured at the Nez Perce Tribe Lolo Creek Bridge gage located approximately 50 feet upstream of the temporary weir location. The hydraulic control for the project reach is located along a bend in the river downstream of the proposed weir.

Table 3. Lolo Creek average monthly flows (cfs) as measured at Lolo Creek bridge (2005-2009[1]).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Flows (cfs)	285.3	196.3	465.8	760.6	737.9	380.5	67.7	33.6	24.4	36.2	106.4	232.8

[1] Source: Nez Perce Tribe unpublished data

2.6 Flood Recurrence

USGS flood recurrence flows that were calculated using a regression analysis were used in the model. Calculating flows with the regression method does present some error that should be noted. This error ranged from 47 to 67 percent. Therefore, flows calculated using the USGS SSP method multiplied by the flow factor are shown in Table 4 for comparison. Figure 4 presents the results of the SSP calculation.

Table 4. Calculated return period, probability and peak instantaneous discharges for Lolo Creek.

Return Period (yr)	Probability	USGS Regression Flows (cfs)	USGS SSP-Adjusted Flows (cfs)
2	0.50	1,590	2,110
10	0.10	3,410	3,721
50	0.02	5,340	5,052
100	0.01	6,230	5,593

It can be seen that the values for the adjusted flows are similar to the regression flows and support the values obtained by the regression analysis.

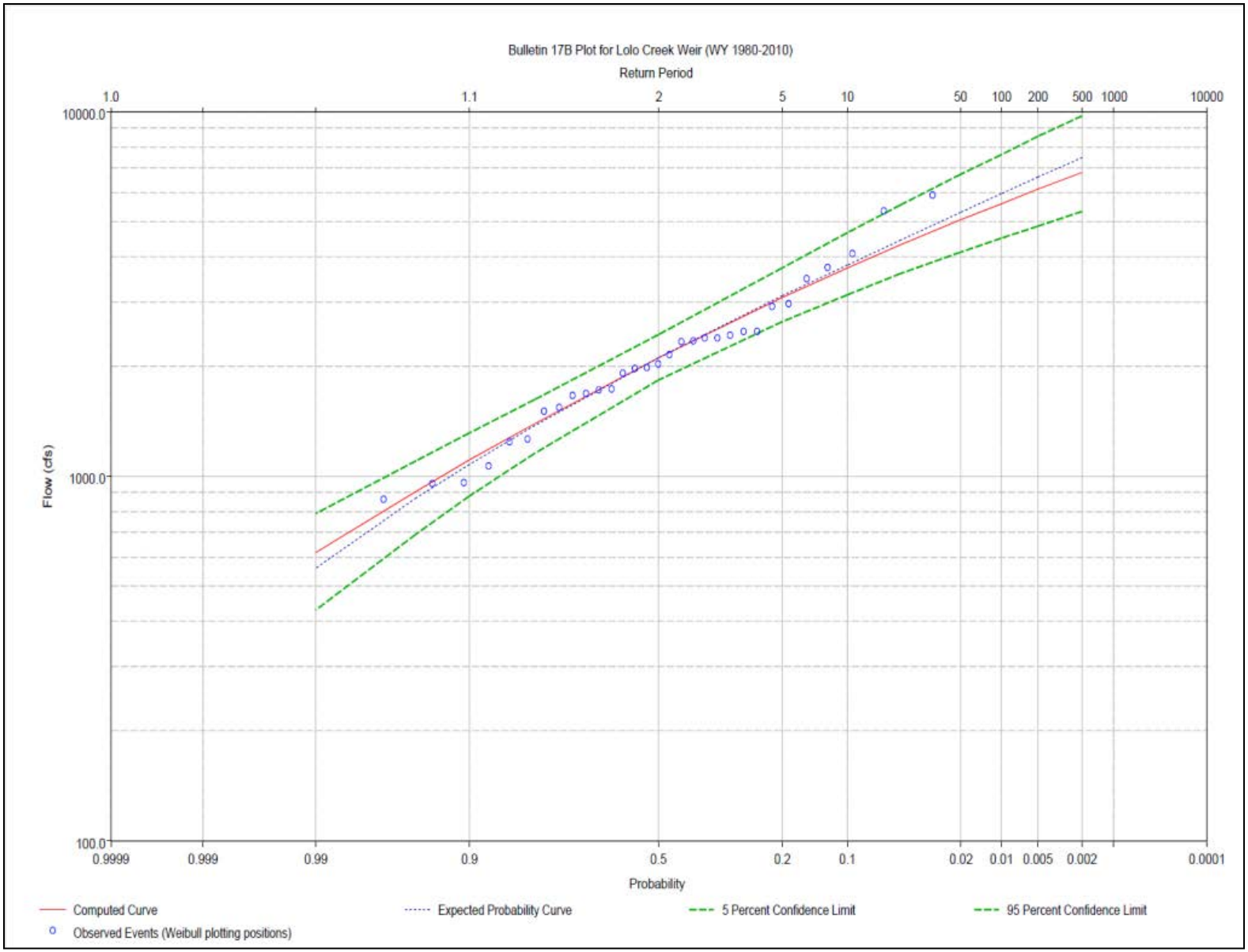

Figure 4. Bulletin 17B plot for Lolo Creek weir.

2.7 Selected Flows for Further Evaluation and Design

The flows selected for the hydraulic model were the 5%, 95% exceedance values and the 2-, 10-, and 100-YR flood flows. The exceedance values were chosen based on fish passage requirements and the flood flows were chosen to show flood impacts on the in-stream structure.

The 95% exceedance flow was selected to represent the typical baseflow as well as the low fish passage flow (NMFS 2008). The high fish passage flow selected per National Marine Fisheries Service (NMFS) criteria was the 5% exceedance flow. The high operational flow was established based on communication with the Washington Department of Fish & Wildlife (WDFW). WDFW deemed it acceptable to have a short period of down time every other year. This scenario corresponds to the 2-YR flow, where the recurrence interval may be 50% every year or once every other year.

The design flood flow recommended by NMFS is the 50-YR flow. This flow is modeled to account for overtopping. It was determined that for this facility, the 50-YR would be excessive. To accommodate operational feasibility and cost issues, the 10-YR flow was determined to be adequate for the design.

Impacts to the floodplain were also examined, requiring the 100-YR flow to be included in the model.

3 Existing Hydraulics

Existing water surface elevations and average velocities were estimated using the HEC-RAS hydraulic model under a steady-flow simulation. The development of the existing conditions model is described in the following paragraphs.

3.1 Existing Geometry

Existing geometry was obtained from the TIN surface created from the survey data previously described in the document. From these data, twenty-nine cross sections were created and imported into HEC-RAS to reflect existing conditions. The maximum spacing between cross sections is 50 ft; spacing between cross sections was reduced to approximately 20 ft at the proposed passage barrier location to obtain additional channel data. The two most upstream cross sections were removed from the model as the limited survey data in this area resulted in erroneous results for higher flows. Refer to Figure 5 for a hydraulic base map.

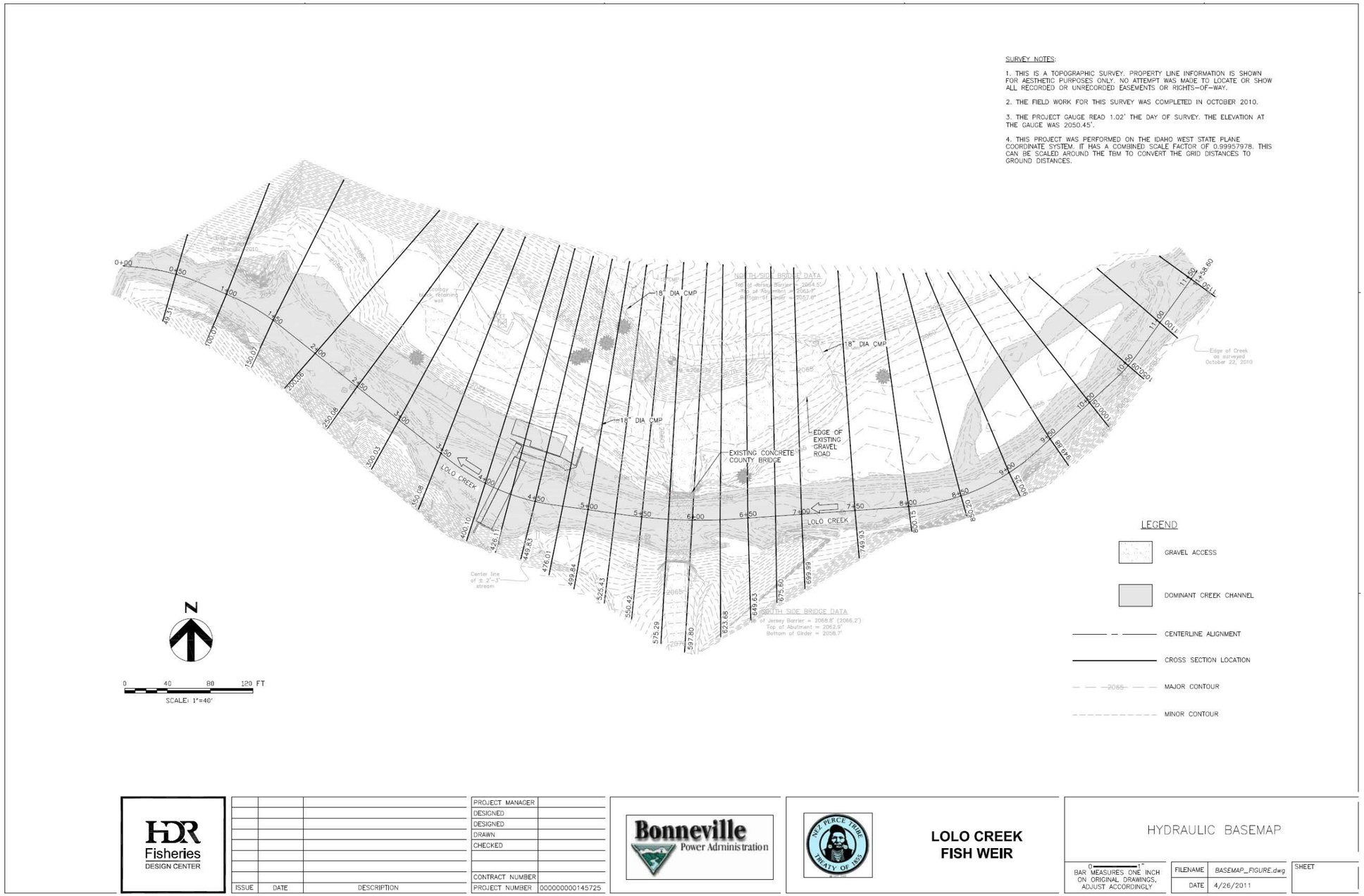

Figure 5. Lolo Creek Satellite Facility Hydraulic Basemap

3.2 Existing Manning's n Roughness Calculations

Existing conditions Manning's n calculations were performed for the main channel and overbank areas and are summarized in Table 5. Calculations for the main channel and overbank areas are provided in Appendix A.

Table 5. Summary of calculated Manning's n values reflecting existing conditions.

Left Overbank	Main Channel	Right Overbank
Overbank	Active Channel	Overbank
0.082	0.042	0.050

3.3 Boundary Conditions

The upstream and downstream boundary conditions were set to a normal depth calculation using the average channel gradient. Channel gradient for the model was determined by calculating the average gradient between several channel inverts at each end of the model. The resulting channel gradient was estimated to be 0.01 ft/ft.

3.4 Comparison to Observed Water Surface Elevation

The computed existing conditions water surface elevations were compared with observed water surface elevations in an effort to evaluate how closely the model predicted actual conditions. Water surface elevations were recorded on the day of survey. On the day of survey, the USGS gage data indicates that creek discharge was approximately 27 cfs. The 2-YR observed water surface elevation from the gage data (at approximately station 5+75.29) was approximately 2056.20 ft, while the 2-YR HEC-RAS estimated water surface elevation was approximately 2056.42 ft. Rating curves comparing the observed date versus the model results are shown in Figure 6.

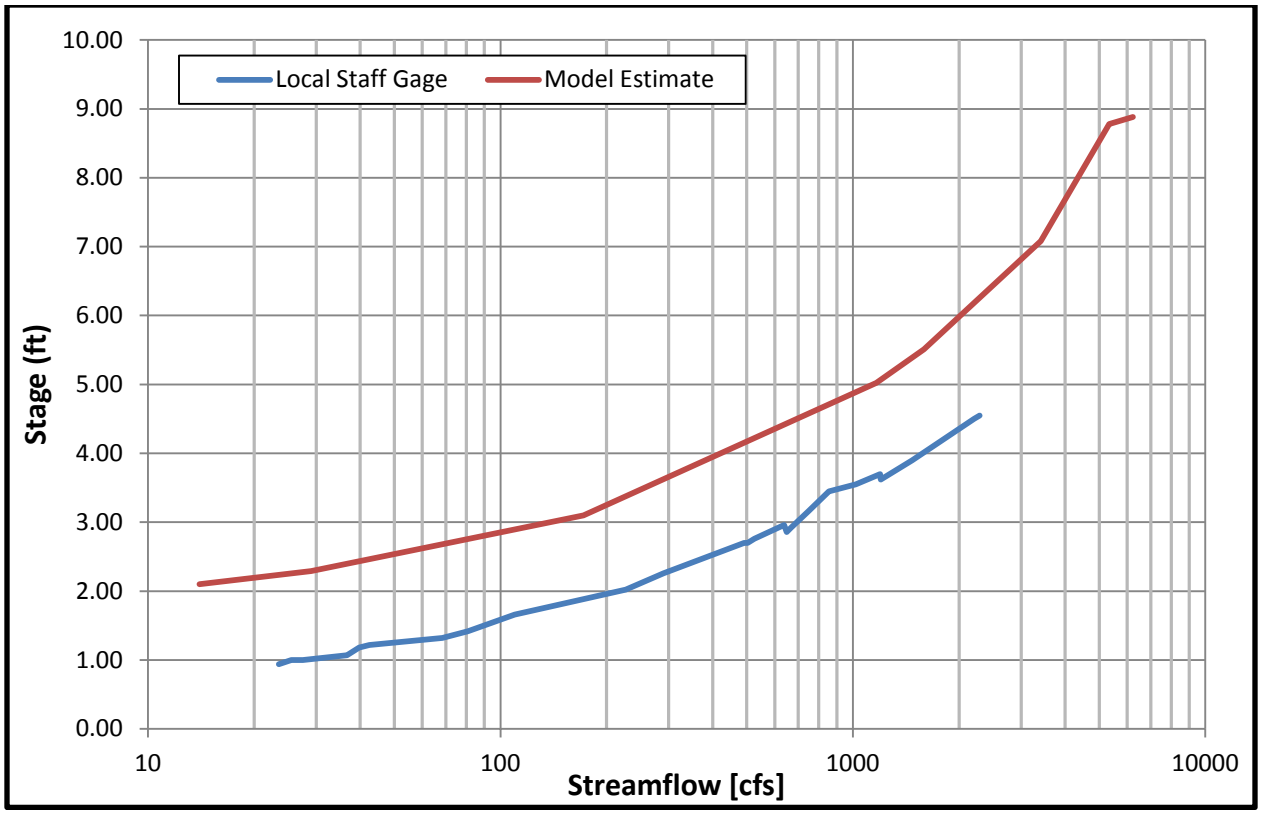

Figure 6. Lolo Creek rating curve comparison at station 5+75.29.

3.5 Results

The resulting existing hydraulic model was used to estimate water surface elevations (WSE), depths and velocities for the selected flows. Water surface profiles are presented in Figure 7.

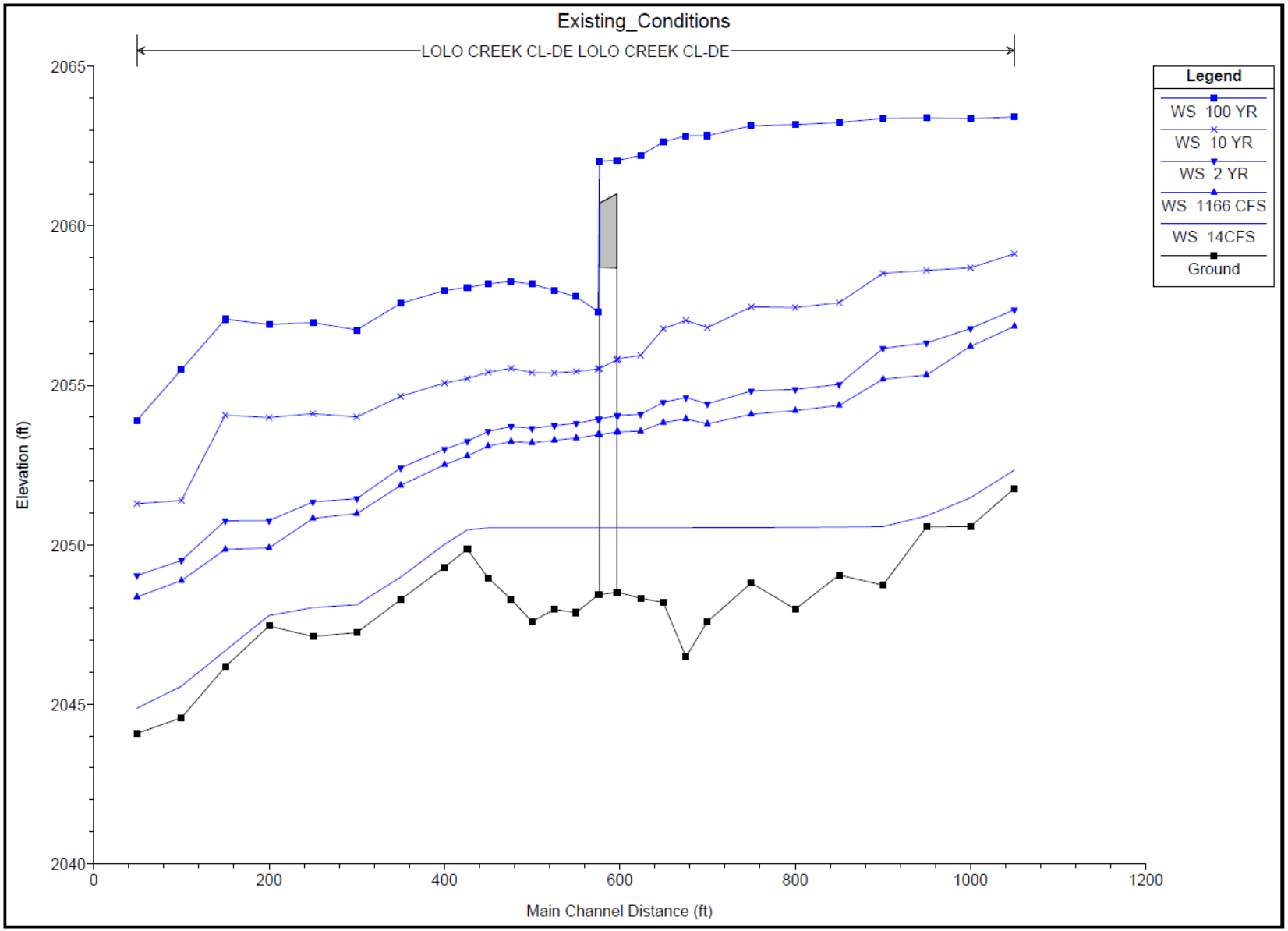

Figure 7. Existing conditions water surface elevation profiles.

Table 6. Existing flow conditions summary of water surface elevations.

Main Channel Distance (ft)	Water Surface Elevation (ft)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	2052.34	2056.85	2057.37	2059.13	2063.41
1000.05	2051.47	2056.22	2056.78	2058.69	2063.36
949.88	2050.90	2055.32	2056.33	2058.60	2063.38
900.25	2050.57	2055.19	2056.16	2058.51	2063.37
850.20	2050.55	2054.37	2055.03	2057.59	2063.24
800.15	2050.55	2054.21	2054.87	2057.44	2063.17
749.93	2050.54	2054.09	2054.82	2057.46	2063.14
699.99	2050.53	2053.79	2054.42	2056.81	2062.83
675.60	2050.53	2053.95	2054.62	2057.03	2062.83
649.63	2050.53	2053.83	2054.46	2056.78	2062.63
623.68	2050.53	2053.56	2054.09	2055.94	2062.21
597.80	2050.53	2053.53	2054.05	2055.84	2062.05
575.29	2050.53	2053.45	2053.94	2055.51	2057.31
550.42	2050.53	2053.34	2053.81	2055.43	2057.78
525.43	2050.53	2053.28	2053.74	2055.39	2057.98
499.84	2050.53	2053.20	2053.65	2055.40	2058.17
476.01	2050.53	2053.23	2053.71	2055.53	2058.26
449.83	2050.53	2053.09	2053.56	2055.41	2058.18
426.11	2050.47	2052.78	2053.24	2055.21	2058.07
400.10	2050.01	2052.51	2053.00	2055.07	2057.97
350.08	2048.98	2051.86	2052.41	2054.65	2057.57
300.03	2048.12	2050.98	2051.44	2054.01	2056.74
250.08	2048.03	2050.83	2051.34	2054.11	2056.97
200.06	2047.78	2049.90	2050.76	2053.99	2056.91
150.07	2046.68	2049.85	2050.76	2054.06	2057.07
100.07	2045.56	2048.88	2049.50	2051.39	2055.49
49.31	2044.87	2048.36	2049.04	2051.29	2053.90

Table 7. Existing flow conditions summary of depths.

Main Channel Distance (ft)	Depth (ft)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	0.57	5.08	5.60	7.36	11.64
1000.05	0.90	5.65	6.21	8.12	12.79
949.88	0.34	4.76	5.77	8.04	12.82
900.25	1.84	6.46	7.43	9.78	14.64
850.20	1.50	5.32	5.98	8.54	14.19
800.15	2.57	6.23	6.89	9.46	15.19
749.93	1.74	5.29	6.02	8.66	14.34
699.99	2.94	6.20	6.83	9.22	15.24
675.60	4.05	7.47	8.14	10.55	16.35
649.63	2.34	5.64	6.27	8.59	14.44
623.68	2.21	5.24	5.77	7.62	13.89
597.80	2.02	5.02	5.54	7.33	13.54
575.29	2.10	5.02	5.51	7.08	8.88
550.42	2.66	5.47	5.94	7.56	9.91
525.43	2.56	5.31	5.77	7.42	10.01
499.84	2.94	5.61	6.06	7.81	10.58
476.01	2.24	4.94	5.42	7.24	9.97
449.83	1.57	4.13	4.60	6.45	9.22
426.11	0.61	2.92	3.38	5.35	8.21
400.10	0.71	3.21	3.70	5.77	8.67
350.08	0.70	3.58	4.13	6.37	9.29
300.03	0.88	3.74	4.20	6.77	9.50
250.08	0.91	3.71	4.22	6.99	9.85
200.06	0.33	2.45	3.31	6.54	9.46
150.07	0.51	3.68	4.59	7.89	10.90
100.07	0.99	4.31	4.93	6.82	10.92
49.31	0.79	4.28	4.96	7.21	9.82

Table 8. Existing flow conditions summary of velocities.

Main Channel Distance (ft)	Velocity (ft/s)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	2.94	5.15	5.71	7.12	6.15
1000.05	1.48	6.24	6.61	7.68	5.98
949.88	2.81	7.46	6.19	6.44	5.17
900.25	0.51	5.18	4.97	5.77	4.84
850.20	0.56	7.42	8.51	9.31	6.07
800.15	0.43	6.45	7.48	8.82	6.20
749.93	0.50	5.61	6.25	7.44	5.88
699.99	0.27	6.07	7.08	9.18	7.34
675.60	0.13	3.80	4.54	6.53	6.32
649.63	0.18	4.41	5.27	7.51	7.23
623.68	0.26	5.78	6.93	10.37	9.04
597.80	0.19	4.97	6.04	9.37	8.61
575.29	0.18	5.07	6.20	9.91	13.99
550.42	0.21	5.28	6.39	9.72	12.11
525.43	0.21	5.03	6.05	8.99	10.47
499.84	0.20	4.88	5.82	8.14	8.94
476.01	0.14	3.83	4.63	6.63	7.85
449.83	0.31	4.37	5.07	6.72	7.65
426.11	1.78	5.38	5.94	6.96	7.61
400.10	2.26	5.51	6.04	6.97	7.64
350.08	2.95	6.18	6.66	7.61	8.54
300.03	1.16	7.28	8.22	8.91	10.57
250.08	0.82	5.22	5.98	6.79	8.28
200.06	1.77	7.45	7.01	6.63	7.99
150.07	1.92	4.94	5.06	5.28	6.31
100.07	2.43	7.90	9.06	13.12	11.72
49.31	1.64	8.34	9.33	12.31	15.39

4 Proposed Hydraulics

Proposed water surface elevations and average velocities were estimated using the HEC-RAS hydraulic model under steady-flow conditions. Development of the proposed conditions model is described in the following paragraphs.

4.1 Proposed Geometry

Cross section 4+13.15 was added into the model geometry file to represent the proposed weir facility. The proposed project conditions were simplified into two potential configurations: 1) A picket weir when the picket panels are retracted to lie parallel with the creek bed (0% operation) and 2) a picket weir when the panels are raised to an incline of 45 degrees from the creek bed to a height of 3 ft above the proposed concrete sill (100% operation). The modified cross sections with the picket weir at 0% and 100% operation inserted into the hydraulic model are shown in Figure 8 and Figure 9.

The concrete sill was modeled by adding an inline structure with a crest height of 2057.0 ft and an invert elevation of 2049.8 ft across the channel bottom. The proposed building, fish ladder and fill areas were represented in the model as obstructions.

The picket panels were modeled by adding multiple series of gated weirs representing the numerous, narrow orifices located in between pickets. For this design, 20 gated weirs with 25 openings per gate were configured. It was assumed that the size of each opening was 1 inch (0.083 ft) to meet fish passage requirements. At 100% operation, the pickets are oriented at a 45 degree angle downstream, overhanging the edge of the concrete sill. This results in a higher wetted area. With the modeling approach used, the total wetted area is negated and it is assumed that the head loss is produced by the net effective area.

4.2 Proposed Manning's n Roughness Calculations

Modifications to the Manning's n roughness values to reflect proposed conditions were not required. The roughness conditions remained the same as the existing conditions, as there are no expected stream channel modifications outside of the weir structure.

4.3 Boundary Conditions

The boundary conditions remained the same for the proposed conditions and modifications were not required.

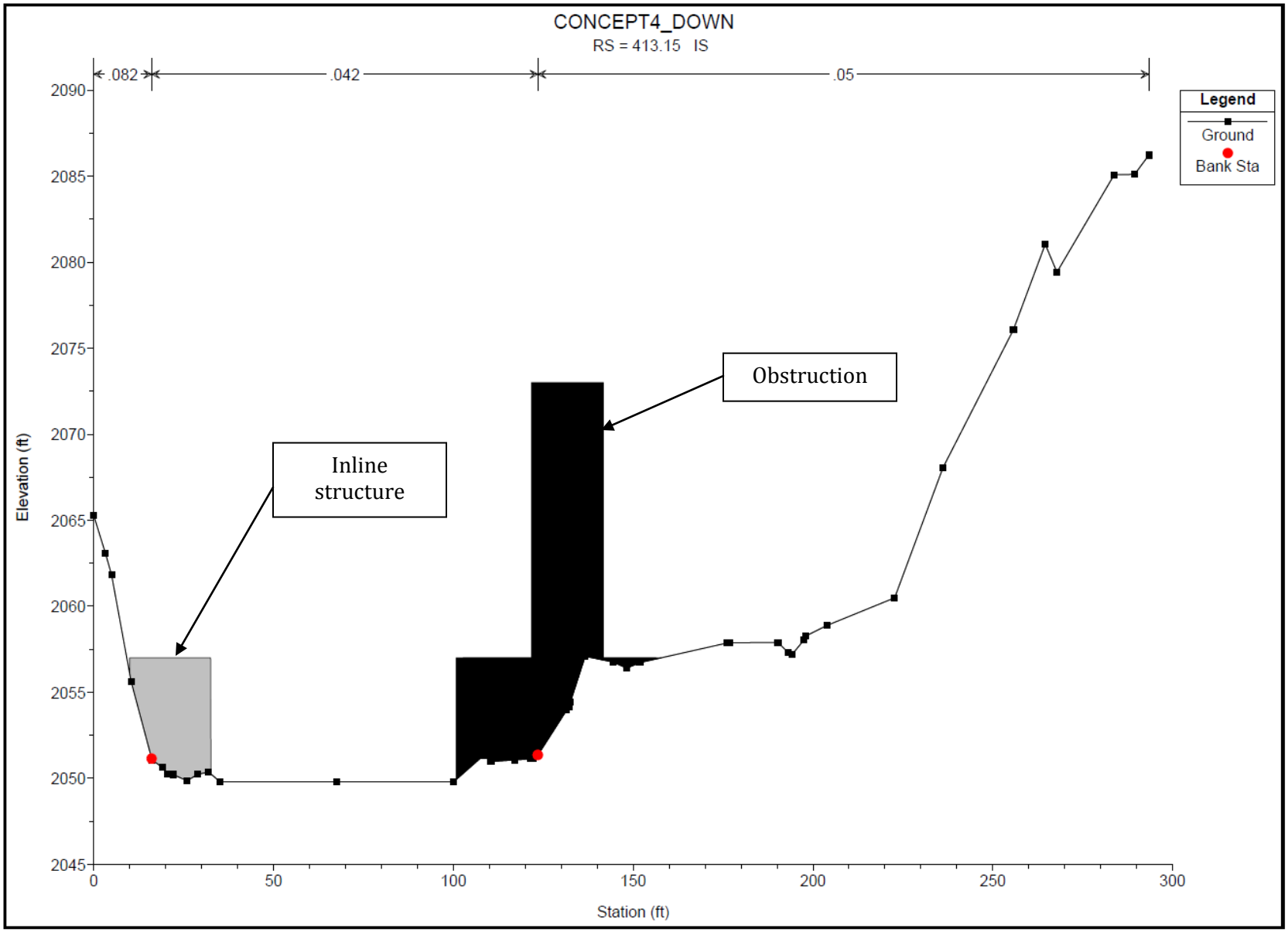

Figure 8. The modified cross section representing the 0% picket operation in the HEC-RAS model.

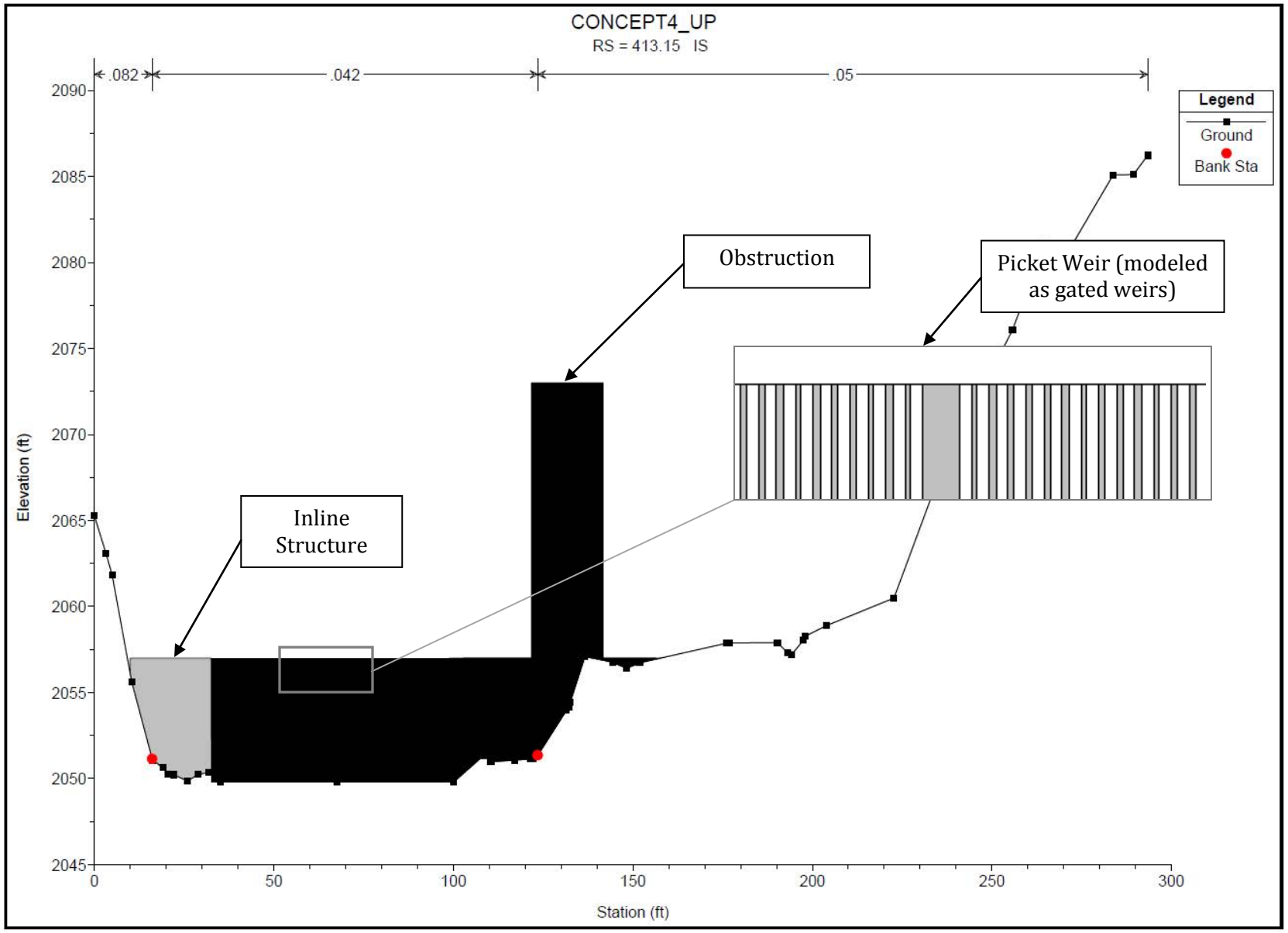

Figure 9. The modified cross section representing the 100% picket operation in the **HEC-RAS model.**

4.4 Results of Proposed Conditions Hydraulic Calculations

Calculated water surface elevations, depths and velocities reflecting proposed conditions at the 0% and 100% picket positions are shown for the 14 cfs, 1,166 cfs, 2-YR (1,590 cfs), 10-YR (3,410 cfs) and the 100 YR (13,500 cfs) (Table 9 through Table 14). Water surface profiles for the 0% and 100% picket positions are shown in Figure 10 and Figure 11, respectively.

Table 9. Proposed flow conditions summary of water surface elevations for 0% operation.

Main Channel Distance (ft)	Water Surface Elevation (ft)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	2052.34	2056.85	2057.37	2059.23	2064.12
1000.05	2051.47	2056.22	2056.79	2058.86	2064.10
949.88	2050.90	2055.35	2056.36	2058.79	2064.11
900.25	2050.19	2055.22	2056.20	2058.72	2064.11
850.20	2050.14	2054.42	2055.16	2058.09	2064.01
800.15	2050.11	2054.27	2055.04	2057.97	2063.96
749.93	2050.07	2054.17	2055.01	2057.98	2063.92
699.99	2050.06	2053.89	2054.68	2057.52	2063.66
675.60	2050.06	2054.04	2054.84	2057.66	2063.65
649.63	2050.06	2053.93	2054.71	2057.47	2063.55
623.68	2050.06	2053.69	2054.41	2056.95	2063.30
597.80	2050.06	2053.66	2054.38	2056.88	2062.99
575.29	2050.06	2053.59	2054.29	2056.74	2058.52
550.42	2050.05	2053.45	2054.14	2056.61	2058.52
525.43	2050.05	2053.40	2054.10	2056.67	2058.77
499.84	2050.05	2053.36	2054.09	2056.84	2059.23
476.01	2050.05	2053.30	2053.98	2056.50	2058.73
449.83	2050.04	2053.05	2053.79	2056.41	2058.60
426.11	2049.98	2053.04	2053.79	2056.44	2058.60
400.10	2049.97	2052.43	2052.90	2054.83	2057.63
350.08	2048.98	2051.86	2052.41	2054.65	2057.57
300.03	2048.12	2050.98	2051.44	2054.01	2056.74
250.08	2048.03	2050.83	2051.34	2054.11	2056.97
200.06	2047.78	2049.90	2050.76	2053.99	2056.91
150.07	2046.68	2049.85	2050.76	2054.06	2057.07
100.07	2045.56	2048.88	2049.50	2051.39	2055.49
49.31	2044.87	2048.36	2049.04	2051.29	2053.90

Table 10. Proposed conditions summary of depths for 0% operation.

Main Channel Distance (ft)	Depth (ft)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	0.57	5.08	5.60	7.46	12.35
1000.05	0.90	5.65	6.22	8.29	13.53
949.88	0.34	4.79	5.80	8.23	13.55
900.25	1.46	6.49	7.47	9.99	15.38
850.20	1.09	5.37	6.11	9.04	14.96
800.15	2.13	6.29	7.06	9.99	15.98
749.93	1.27	5.37	6.21	9.18	15.12
699.99	2.47	6.30	7.09	9.93	16.07
675.60	3.58	7.56	8.36	11.18	17.17
649.63	1.87	5.74	6.52	9.28	15.36
623.68	1.74	5.37	6.09	8.63	14.98
597.80	1.55	5.15	5.87	8.37	14.48
575.29	1.63	5.16	5.86	8.31	10.09
550.42	2.18	5.58	6.27	8.74	10.65
525.43	2.08	5.43	6.13	8.70	10.8
499.84	2.46	5.77	6.50	9.25	11.64
476.01	1.76	5.01	5.69	8.21	10.44
449.83	1.08	4.09	4.83	7.45	9.64
426.11	0.18	3.24	3.99	6.64	8.80
400.10	0.17	2.63	3.10	5.03	7.83
350.08	0.70	3.58	4.13	6.37	9.29
300.03	0.88	3.74	4.2	6.77	9.50
250.08	0.91	3.71	4.22	6.99	9.85
200.06	0.33	2.45	3.31	6.54	9.46
150.07	0.51	3.68	4.59	7.89	10.90
100.07	0.99	4.31	4.93	6.82	10.92
49.31	0.79	4.28	4.96	7.21	9.82

Table 11. Proposed conditions summary of velocities for 0% operation.

Main Channel Distance (ft)	Velocity (ft/s)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	2.94	5.15	5.0	6.94	5.66
1000.05	1.48	6.25	6.58	7.36	5.42
949.88	2.81	7.37	6.11	6.15	4.74
900.25	0.75	5.14	4.90	5.53	4.44
850.20	0.98	7.32	8.25	8.28	5.49
800.15	0.64	6.35	7.17	7.88	5.60
749.93	1.02	5.48	5.96	6.69	5.49
699.99	0.39	5.91	6.66	8.10	6.87
675.60	0.17	3.73	4.36	5.99	5.97
649.63	0.26	4.31	5.01	6.79	6.51
623.68	0.38	5.60	6.45	8.86	7.81
597.80	0.28	4.83	5.65	8.06	8.06
575.29	0.27	4.91	5.76	8.23	12.07
550.42	0.29	5.25	6.11	8.44	11.74
525.43	0.31	4.96	5.68	7.49	10.08
499.84	0.28	4.57	5.08	6.00	7.37
476.01	0.20	4.51	5.30	7.20	8.90
449.83	0.67	5.43	5.81	7.03	8.69
426.11	1.19	4.42	4.86	6.16	7.87
400.10	1.08	5.48	6.33	8.28	9.38
350.08	2.95	6.18	6.66	7.61	8.54
300.03	1.16	7.28	8.22	8.91	10.57
250.08	0.82	5.22	5.98	6.79	8.28
200.06	1.77	7.45	7.01	6.63	7.99
150.07	1.92	4.94	5.06	5.28	6.31
100.07	2.43	7.91	9.06	13.12	11.72
49.31	1.64	8.34	9.33	12.31	15.39

Table 12. Proposed conditions summary of water surface elevations for 100% operation.

Main Channel Distance (ft)	Water Surface Elevation (ft)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	2052.34	2056.85	2057.39	2059.37	2063.36
1000.05	2051.47	2056.23	2056.86	2059.06	2063.31
949.88	2050.90	2055.56	2056.55	2059.02	2063.32
900.25	2050.20	2055.42	2056.43	2058.95	2063.31
850.20	2050.16	2054.78	2055.68	2058.48	2063.18
800.15	2050.13	2054.68	2055.66	2058.38	2063.11
749.93	2050.09	2054.64	2055.66	2058.39	2063.08
699.99	2050.08	2054.46	2055.45	2058.01	2062.76
675.60	2050.08	2054.56	2055.55	2058.11	2062.76
649.63	2050.08	2054.49	2055.47	2057.96	2062.57
623.68	2050.08	2054.33	2055.28	2057.54	2062.24
597.80	2050.08	2054.31	2055.26	2057.48	2061.94
575.29	2050.08	2054.27	2055.21	2057.36	2059.41
550.42	2050.08	2054.20	2055.14	2057.29	2059.50
525.43	2050.08	2054.18	2055.14	2057.36	2059.69
499.84	2050.07	2054.18	2055.16	2057.50	2060.07
476.01	2050.07	2054.13	2055.08	2057.27	2059.78
449.83	2050.07	2054.06	2055.04	2057.19	2059.71
426.11	2050.02	2054.06	2055.04	2057.19	2059.72
400.10	2049.97	2052.43	2052.90	2054.83	2057.63
350.08	2048.98	2051.86	2052.41	2054.65	2057.57
300.03	2048.12	2050.98	2051.44	2054.01	2056.74
250.08	2048.03	2050.83	2051.34	2054.11	2056.97
200.06	2047.78	2049.90	2050.76	2053.99	2056.91
150.07	2046.68	2049.85	2050.76	2054.06	2057.07
100.07	2045.56	2048.88	2049.50	2051.39	2055.49
49.31	2044.87	2048.36	2049.04	2051.29	2053.90

Table 13. Proposed conditions summary of depths for 100% operation.

Main Channel Distance (ft)	Depth (ft)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	0.57	5.08	5.62	7.60	11.59
1000.05	0.90	5.66	6.29	8.49	12.74
949.88	0.34	5.00	5.99	8.46	12.76
900.25	1.47	6.69	7.70	10.22	14.58
850.20	1.11	5.73	6.63	9.43	14.13
800.15	2.15	6.70	7.68	10.40	15.13
749.93	1.29	5.84	6.86	9.59	14.28
699.99	2.49	6.87	7.86	10.42	15.17
675.60	3.60	8.08	9.07	11.63	16.28
649.63	1.89	6.30	7.28	9.77	14.38
623.68	1.76	6.01	6.96	9.22	13.92
597.80	1.57	5.8	6.75	8.97	13.43
575.29	1.65	5.84	6.78	8.93	10.98
550.42	2.21	6.33	7.27	9.42	11.63
525.43	2.11	6.21	7.17	9.39	11.72
499.84	2.48	6.59	7.57	9.91	12.48
476.01	1.78	5.84	6.79	8.98	11.49
449.83	1.11	5.10	6.08	8.23	10.75
426.11	0.22	4.26	5.24	7.39	9.92
400.10	0.17	2.63	3.10	5.03	7.83
350.08	0.70	3.58	4.13	6.37	9.29
300.03	0.88	3.74	4.20	6.77	9.50
250.08	0.91	3.71	4.22	6.99	9.85
200.06	0.33	2.45	3.31	6.54	9.46
150.07	0.51	3.68	4.59	7.89	10.90
100.07	0.99	4.31	4.93	6.82	10.92
49.31	0.79	4.28	4.96	7.21	9.82

Table 14. Proposed conditions summary of velocities for 100% operation.

Main Channel Distance (ft)	Velocity (ft/s)				
	14 cfs	1,166 cfs	2-YR (1,590 cfs)	10-YR (3,410 cfs)	100-YR (6,230 cfs)
1050.09	2.94	5.15	5.67	6.70	6.19
1000.05	1.48	6.23	6.38	7.02	6.03
949.88	2.81	6.68	5.64	5.85	5.21
900.25	0.74	4.75	4.55	5.28	4.87
850.20	0.96	6.65	7.26	7.58	6.12
800.15	0.63	5.75	6.16	7.25	6.25
749.93	0.98	4.81	5.09	6.20	5.91
699.99	0.38	5.14	5.63	7.48	7.40
675.60	0.17	3.37	3.84	5.65	6.34
649.63	0.25	3.85	4.34	6.37	7.22
623.68	0.37	4.82	5.43	8.15	8.72
597.80	0.27	4.20	4.80	7.46	8.76
575.29	0.26	4.24	4.86	7.59	10.99
550.42	0.29	4.43	5.00	7.63	10.40
525.43	0.30	4.09	4.56	6.74	8.95
499.84	0.28	3.64	3.92	5.42	6.49
476.01	0.20	3.77	4.24	6.30	7.51
449.83	0.64	3.95	4.25	6.14	7.26
426.11	0.96	3.33	3.66	5.47	6.62
400.10	1.08	5.48	6.33	8.28	9.38
350.08	2.95	6.18	6.66	7.61	8.54
300.03	1.16	7.28	8.22	8.91	10.57
250.08	0.82	5.22	5.98	6.79	8.28
200.06	1.77	7.45	7.01	6.63	7.99
150.07	1.92	4.94	5.06	5.28	6.31
100.07	2.43	7.91	9.06	13.12	11.72
49.31	1.64	8.34	9.33	12.31	15.39

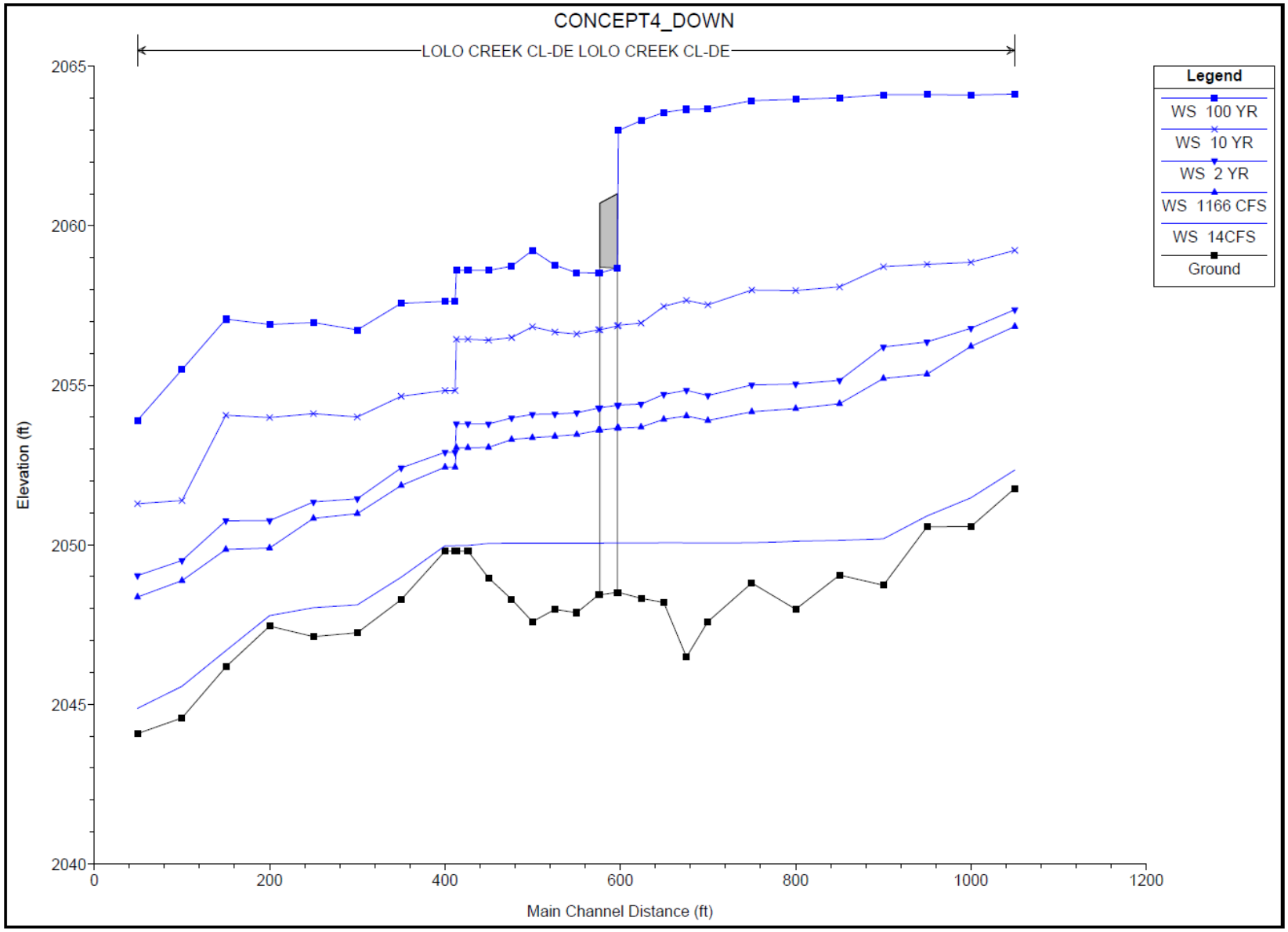

Figure 10. Water surface profiles for 0% operation.

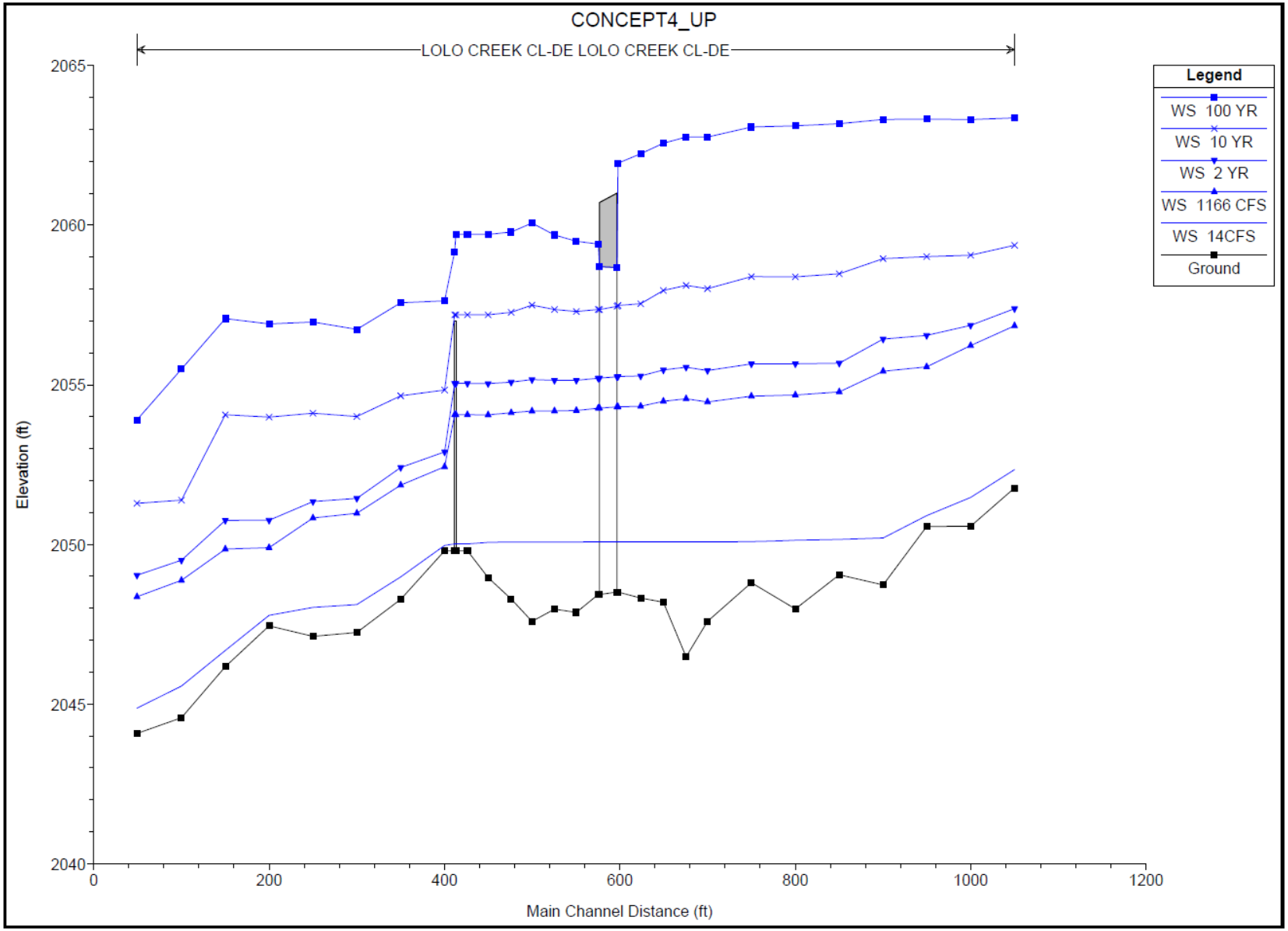

Figure 11. Water surface profiles for 100% operation.

5 Evaluation of Hydraulic Impacts

The calculated existing and proposed conditions water surface profiles and velocities were compared to evaluate the extent of hydraulic impacts. These comparisons are described in the following paragraphs.

5.1 Impact to 100-YR Flows

As expected, water surface elevations near the bridge increase as a result of constructing the proposed weir structure (Figure 12). From Table 15, it can be seen that the differentials between the existing and 0% operation elevations increase on approach to the bridge, reaching a maximum of 1.21 ft at a main channel distance of 575.29 ft. Elevation differentials begin to decrease downstream of the bridge to a minimum of -0.34 ft at main channel distance of 400.10 ft. Proposed elevations match existing elevations at a main channel distance of 350.08 ft.

Velocities increase at the location of the proposed weir structure with a maximum differential of 1.74 ft/s at a main channel distance of 400.10 ft.

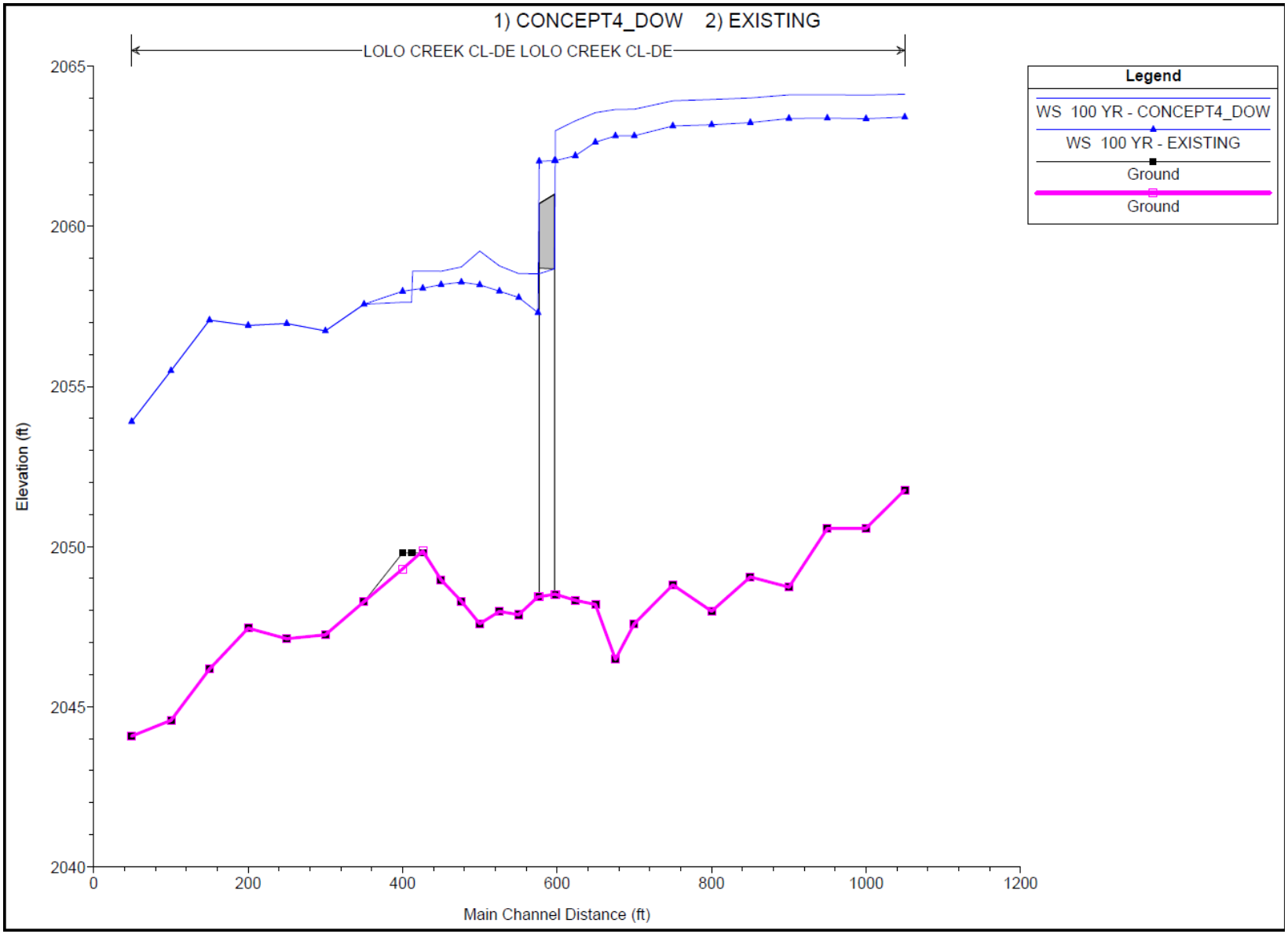

Figure 12. Water surface profile of existing and 0% conditions for the 100-YR flow.

Table 15. Comparison of existing and proposed (0%) conditions for the 100-YR flow.

Main Channel Distance (ft)	Water Surface Elevation (ft)			Velocity (ft/s)		
	Existing Conditions	Proposed Conditions (0%)	Differential	Existing Conditions	Proposed Conditions (0%)	Differential
1050.09	2063.41	2064.12	0.71	6.15	5.66	-0.49
1000.05	2063.36	2064.10	0.74	5.98	5.42	-0.56
949.88	2063.38	2064.11	0.73	5.17	4.74	-0.43
900.25	2063.37	2064.11	0.74	4.84	4.44	-0.40
850.20	2063.24	2064.01	0.77	6.07	5.49	-0.58
800.15	2063.17	2063.96	0.79	6.20	5.60	-0.60
749.93	2063.14	2063.92	0.78	5.88	5.49	-0.39
699.99	2062.83	2063.66	0.83	7.34	6.87	-0.47
675.60	2062.83	2063.65	0.82	6.32	5.97	-0.35
649.63	2062.63	2063.55	0.92	7.23	6.51	-0.72
623.68	2062.21	2063.30	1.09	9.04	7.81	-1.23
597.80	2062.05	2062.99	0.94	8.61	8.06	-0.55
575.29	2057.31	2058.52	1.21	13.99	12.07	-1.92
550.42	2057.78	2058.52	0.74	12.11	11.74	-0.37
525.43	2057.98	2058.77	0.79	10.47	10.08	-0.39
499.84	2058.17	2059.23	1.06	8.94	7.37	-1.57
476.01	2058.26	2058.73	0.47	7.85	8.90	1.05
449.83	2058.18	2058.60	0.42	7.65	8.69	1.04
426.11	2058.07	2058.60	0.53	7.61	7.87	0.26
400.10	2057.97	2057.63	-0.34	7.64	9.38	1.74
350.08	2057.57	2057.57	0	8.54	8.54	0
300.03	2056.74	2056.74	0	10.57	10.57	0
250.08	2056.97	2056.97	0	8.28	8.28	0
200.06	2056.91	2056.91	0	7.99	7.99	0
150.07	2057.07	2057.07	0	6.31	6.31	0
100.07	2055.49	2055.49	0	11.72	11.72	0
49.31	2053.9	2053.90	0	15.39	15.39	0

5.2 Impact during Operational Flow

As expected, water surface elevations near the bridge increase as a result of constructing the proposed weir structure (Figure 13 and Figure 14). From Table 16, it can be seen that the differentials between the existing and 0% operation elevations are relatively minor and reach a maximum of 0.26 ft at a main channel distance of 426.11 ft. Elevation differentials begin to decrease downstream of the weir structure to a minimum of -0.08 ft at main channel distance of 400.10 ft. Proposed elevations match existing elevations at a main channel distance of 350.08 ft.

Velocities increase only at the fish ladder entrance with a maximum differential of 1.06 ft/s at a main channel distance of 449.83 ft.

From Table 17, it can be seen that the differentials between the existing and 100% operation elevations increase on approach to the propose weir structure and reach a maximum of 1.28 ft at a main channel distance of 426.11 ft. Elevation differentials begin to decrease downstream of the weir structure to a minimum of -0.08 ft at main channel distance of 400.10 ft. Proposed elevations match existing elevations at a main channel distance of 350.08 ft.

Velocities decrease throughout the reach with a minimum differential of -2.05 ft/s at a main channel distance of 426.11 ft.

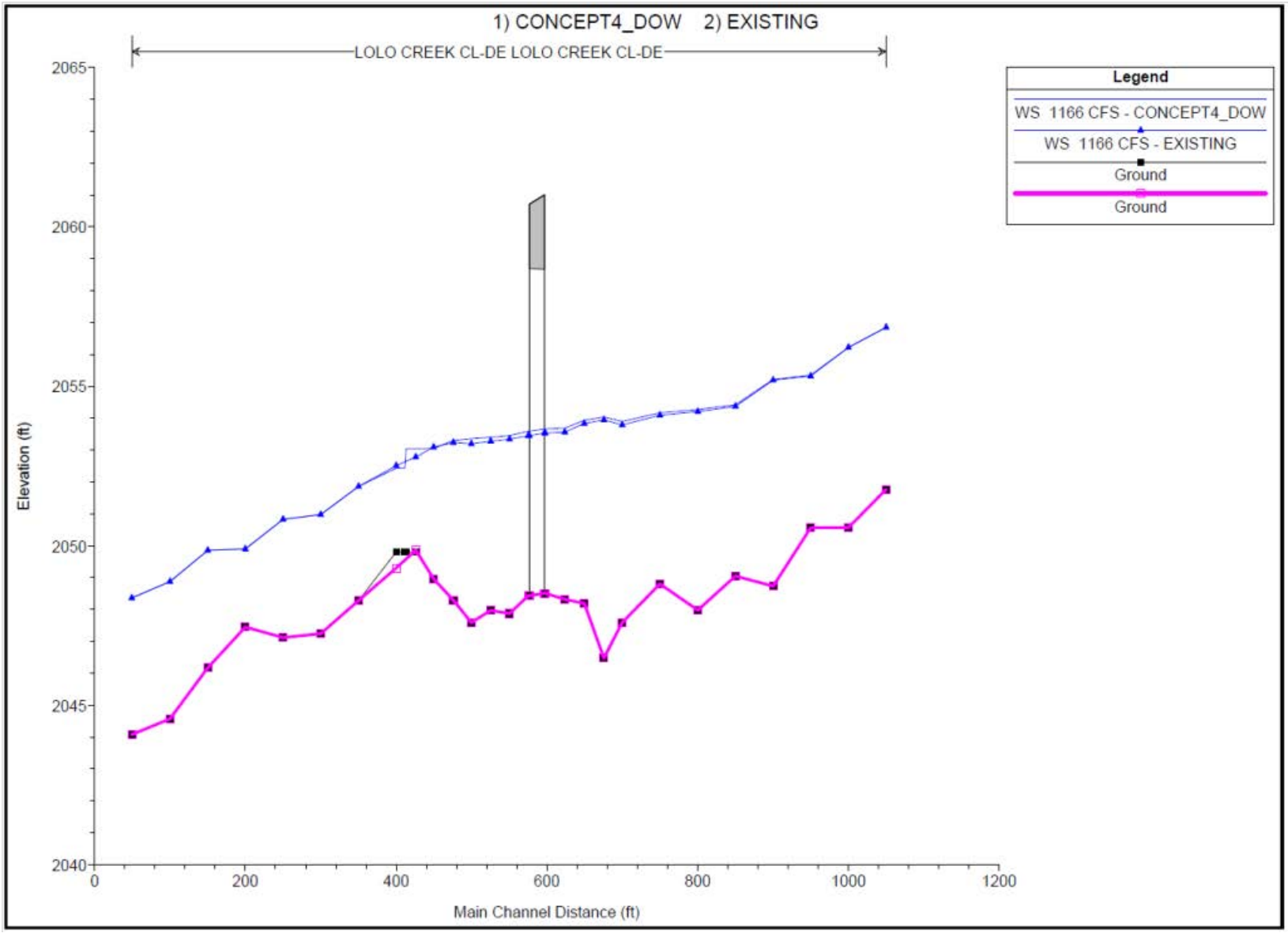

Figure 13. Comparison of water surface elevations for existing and 0% operation for the operational flow (1,166 cfs).

Table 16. Comparison of existing and proposed (0%) conditions for the operational flow (1,166 cfs).

Main Channel Distance (ft)	Water Surface Elevation (ft)			Velocity (ft/s)		
	Existing Conditions	Proposed Conditions (0%)	Differential	Existing Conditions	Proposed Conditions (0%)	Differential
1050.09	2056.85	2056.85	0	5.15	5.15	0
1000.05	2056.22	2056.22	0	6.24	6.25	0.01
949.88	2055.32	2055.35	0.03	7.46	7.37	-0.09
900.25	2055.19	2055.22	0.03	5.18	5.14	-0.04
850.20	2054.37	2054.42	0.05	7.42	7.32	-0.10
800.15	2054.21	2054.27	0.06	6.45	6.35	-0.10
749.93	2054.09	2054.17	0.08	5.61	5.48	-0.13
699.99	2053.79	2053.89	0.10	6.07	5.91	-0.16
675.60	2053.95	2054.04	0.09	3.80	3.73	-0.07
649.63	2053.83	2053.93	0.10	4.41	4.31	-0.10
623.68	2053.56	2053.69	0.13	5.78	5.60	-0.18
597.80	2053.53	2053.66	0.13	4.97	4.83	-0.14
575.29	2053.45	2053.59	0.14	5.07	4.91	-0.16
550.42	2053.34	2053.45	0.11	5.28	5.25	-0.03
525.43	2053.28	2053.40	0.12	5.03	4.96	-0.07
499.84	2053.20	2053.36	0.16	4.88	4.57	-0.31
476.01	2053.23	2053.3	0.07	3.83	4.51	0.68
449.83	2053.09	2053.05	-0.04	4.37	5.43	1.06
426.11	2052.78	2053.04	0.26	5.38	4.42	-0.96
400.10	2052.51	2052.43	-0.08	5.51	5.48	-0.03
350.08	2051.86	2051.86	0	6.18	6.18	0
300.03	2050.98	2050.98	0	7.28	7.28	0
250.08	2050.83	2050.83	0	5.22	5.22	0
200.06	2049.90	2049.90	0	7.45	7.45	0
150.07	2049.85	2049.85	0	4.94	4.94	0
100.07	2048.88	2048.88	0	7.90	7.91	0.01
49.31	2048.36	2048.36	0	8.34	8.34	0

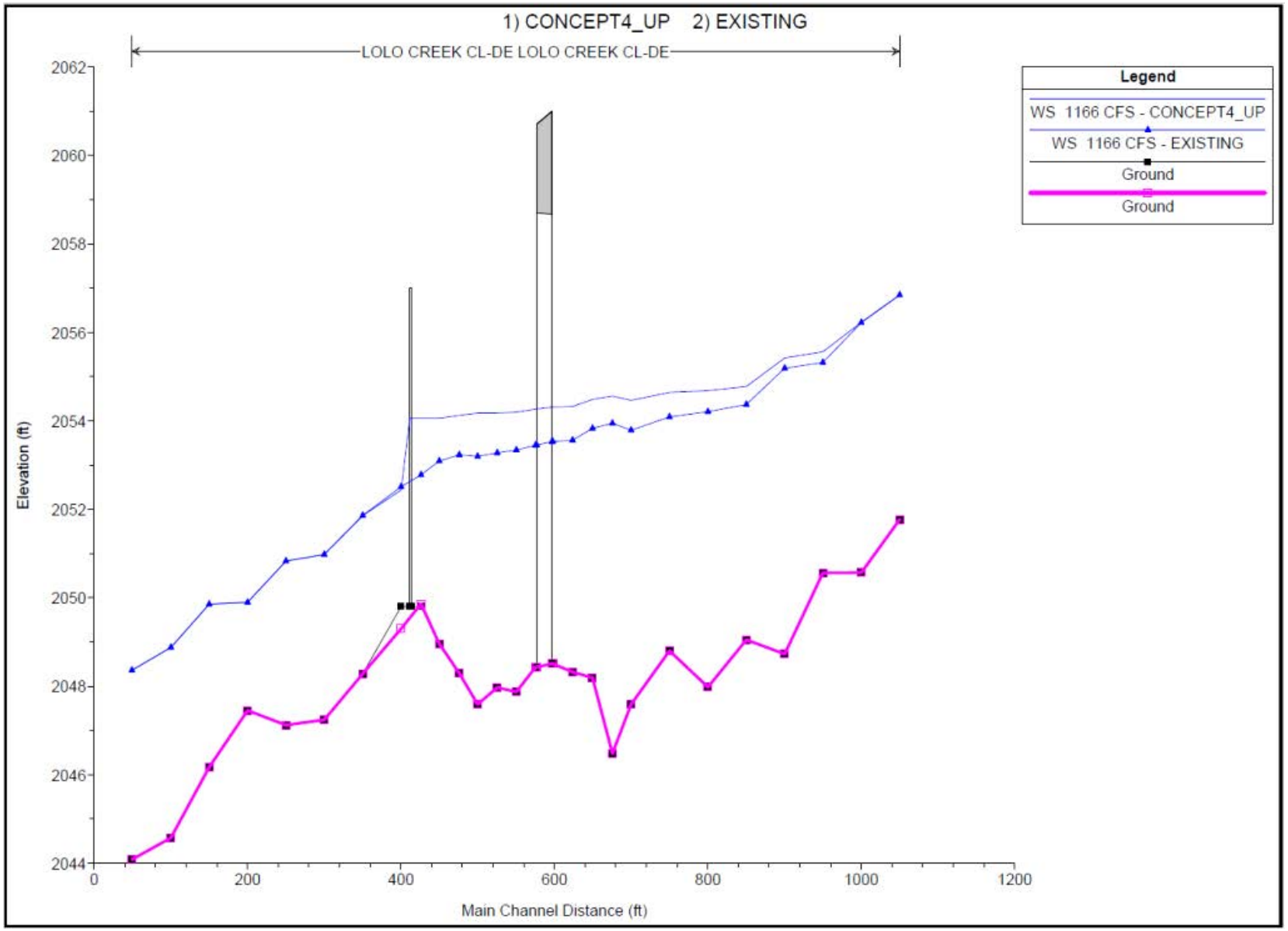

Figure 14. Comparison of water surface elevations for existing and 100% operation for the operational flow (1,166 cfs).

Table 17. Comparison of existing and proposed (100%) conditions for the operational flow (1,166 cfs).

Main Channel Distance (ft)	Water Surface Elevation (ft)			Velocity (ft/s)		
	Existing Conditions	Proposed Conditions (100%)	Differential	Existing Conditions	Proposed Conditions (100%)	Differential
1050.09	2056.85	2056.85	0	5.15	5.15	0
1000.05	2056.22	2056.23	0.01	6.24	6.23	-0.01
949.88	2055.32	2055.56	0.24	7.46	6.68	-0.78
900.25	2055.19	2055.42	0.23	5.18	4.75	-0.43
850.20	2054.37	2054.78	0.41	7.42	6.65	-0.77
800.15	2054.21	2054.68	0.47	6.45	5.75	-0.70
749.93	2054.09	2054.64	0.55	5.61	4.81	-0.80
699.99	2053.79	2054.46	0.67	6.07	5.14	-0.93
675.60	2053.95	2054.56	0.61	3.80	3.37	-0.43
649.63	2053.83	2054.49	0.66	4.41	3.85	-0.56
623.68	2053.56	2054.33	0.77	5.78	4.82	-0.96
597.80	2053.53	2054.31	0.78	4.97	4.2	-0.77
575.29	2053.45	2054.27	0.82	5.07	4.24	-0.83
550.42	2053.34	2054.20	0.86	5.28	4.43	-0.85
525.43	2053.28	2054.18	0.90	5.03	4.09	-0.94
499.84	2053.20	2054.18	0.98	4.88	3.64	-1.24
476.01	2053.23	2054.13	0.90	3.83	3.77	-0.06
449.83	2053.09	2054.06	0.97	4.37	3.95	-0.42
426.11	2052.78	2054.06	1.28	5.38	3.33	-2.05
400.10	2052.51	2052.43	-0.08	5.51	5.48	-0.03
350.08	2051.86	2051.86	0	6.18	6.18	0
300.03	2050.98	2050.98	0	7.28	7.28	0
250.08	2050.83	2050.83	0	5.22	5.22	0
200.06	2049.90	2049.90	0	7.45	7.45	0
150.07	2049.85	2049.85	0	4.94	4.94	0
100.07	2048.88	2048.88	0	7.90	7.91	0.01
49.31	2048.36	2048.36	0	8.34	8.34	0

5.3 Effects of Proposed Activity

The proposed weir facility is not expected to alter the active channel location, the channel slope, the channel form or any relevant water quality parameters. The channel geometry will be graded flat to a 70 ft width at the location of the weir to accommodate the picket structure. Navigation of the creek will be limited during 100% picket operation. However, passage around the Facility will be provided with designated take-out and drop-in locations. During 0% picket operation the creek should still be passable by small watercraft.

The proposed buildings associated with the weir facility will be constructed on the right bank (looking downstream) of the creek floodplain. The structure will minimally affect the geometry of the floodplain. Fill material will be imported and graded to elevations necessary to ensure the stability of the structures. The concrete structures will alter approximately 70 ft of the creek roughness at the project site. Bank protection will be constructed as an additional measure against bank erosion.

Minimal effects to debris loading, amount or timing of flow, existing flow patterns, subsurface flow characteristics, flood storage and aggradation/degradation are expected to occur to the creek channel. Water surface elevations are expected to increase slightly after construction of the weir facility, as shown in Figure 13 and Figure 14.

6 Summary

A summary of the water surface elevation, depth and velocity for three locations (two between the bridge and proposed weir structure; one downstream of the proposed weir structure) are shown in Table 18. Rating curves comparing existing, 0% operation and 100% operation are shown at main channel distance 575.28 ft, 476.01 ft and 400.10 ft (Figure 14 through Figure 16). At the closest location to the bridge (main channel distance 575.28 ft), the rating curve shows an increase in water surface elevation of approximately 1-foot from existing conditions to 0% operation conditions. From 0% operation conditions to 100% operation conditions, there is an additional increase in the water surface elevation of 1-foot. As the main channel distance decreases, the rating curves indicate that water surface elevations also decrease. At main channel distance 400.10 ft, the 0% operation and 100% operation water surface elevations match. This suggests that the proposed weir facility will have a minor impact on water surface elevations during 100% operation. Velocities will see a minor increase locally at the weir structure but will otherwise decrease.

Table 18. Summary of WSE, depth and velocity for 0% and 100% operation.

		0% Operation			100% Operation		
Main Channel Distance (ft)		575.29	476.01	400.1	575.29	476.01	400.1
14cfs	WSE (ft)	2050.06	2050.05	2049.97	2050.08	2050.07	2049.8
	Depth (ft)	1.63	1.76	0.17	1.65	1.78	0.17
	Velocity (ft/s)	0.27	0.2	1.08	0.26	0.2	1.08
1,166 cfs	WSE (ft)	2053.59	2053.3	2052.43	2054.27	2054.13	2052.43
	Depth (ft)	5.16	5.01	2.63	5.84	5.84	2.63
	Velocity (ft/s)	4.91	4.51	5.48	4.24	3.77	5.48
2-YR (1,590 cfs)	WSE (ft)	2054.29	2053.98	2052.9	2055.21	2055.08	2052.9
	Depth (ft)	5.86	5.69	3.1	6.78	6.79	3.1
	Velocity (ft/s)	5.76	5.3	6.33	4.86	4.24	6.33
10-YR (3,410 cfs)	WSE (ft)	2056.74	2056.5	2054.83	2057.36	2057.27	2054.83
	Depth (ft)	8.31	8.21	5.03	8.93	8.98	5.03
	Velocity (ft/s)	8.23	7.2	8.28	7.59	6.3	8.28
100-YR (6,230 cfs)	WSE (ft)	2058.52	2058.73	2057.63	2059.41	2059.78	2057.63
	Depth (ft)	8.31	10.44	7.83	10.98	11.49	7.83
	Velocity (ft/s)	12.07	8.9	9.38	10.99	7.51	9.38

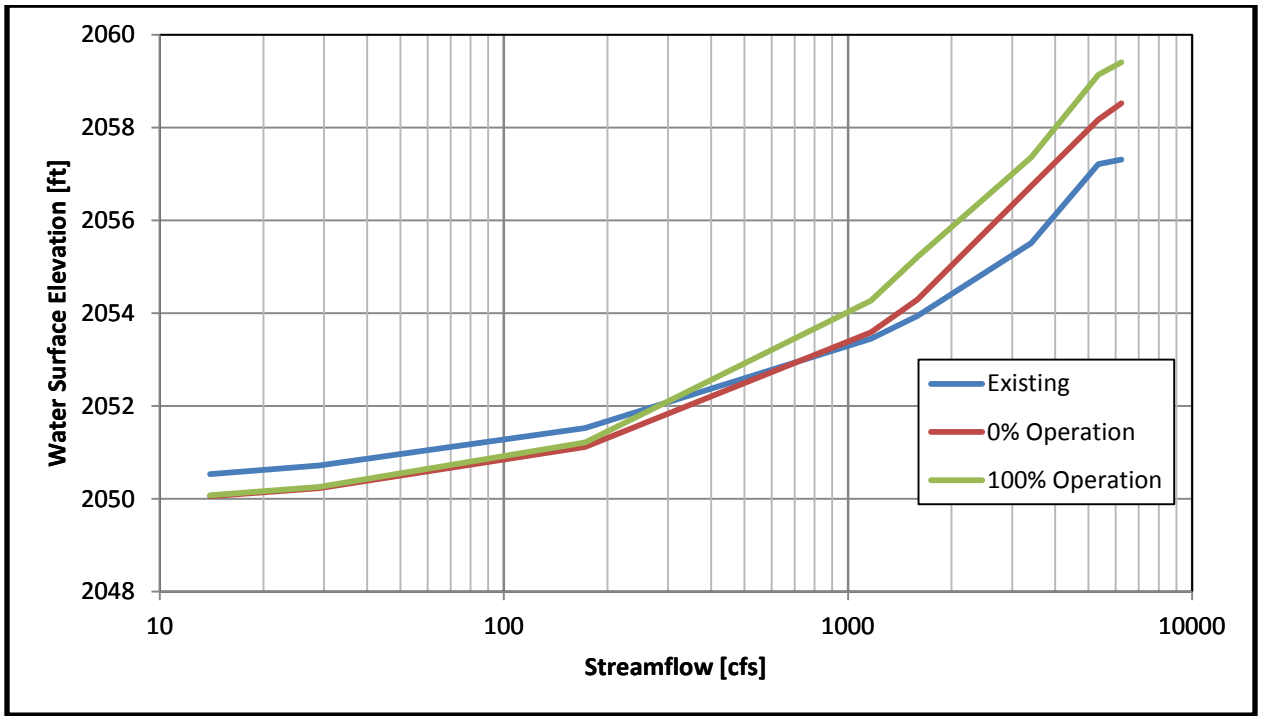

Figure 15. Comparison of rating curves for existing, 0% operation and 100% operation at main channel distance 575.28 ft.

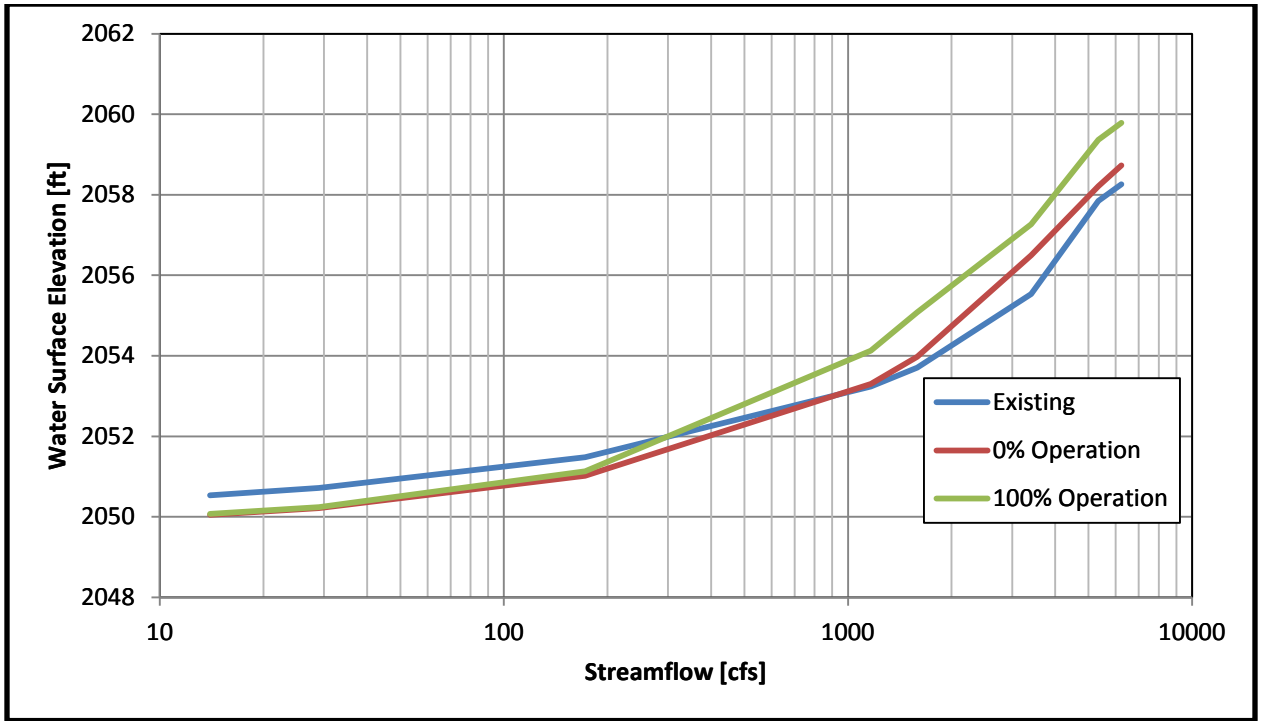

Figure 16. Comparison of rating curves for existing, 0% operation and 100% operation at main channel distance 476.01 ft.

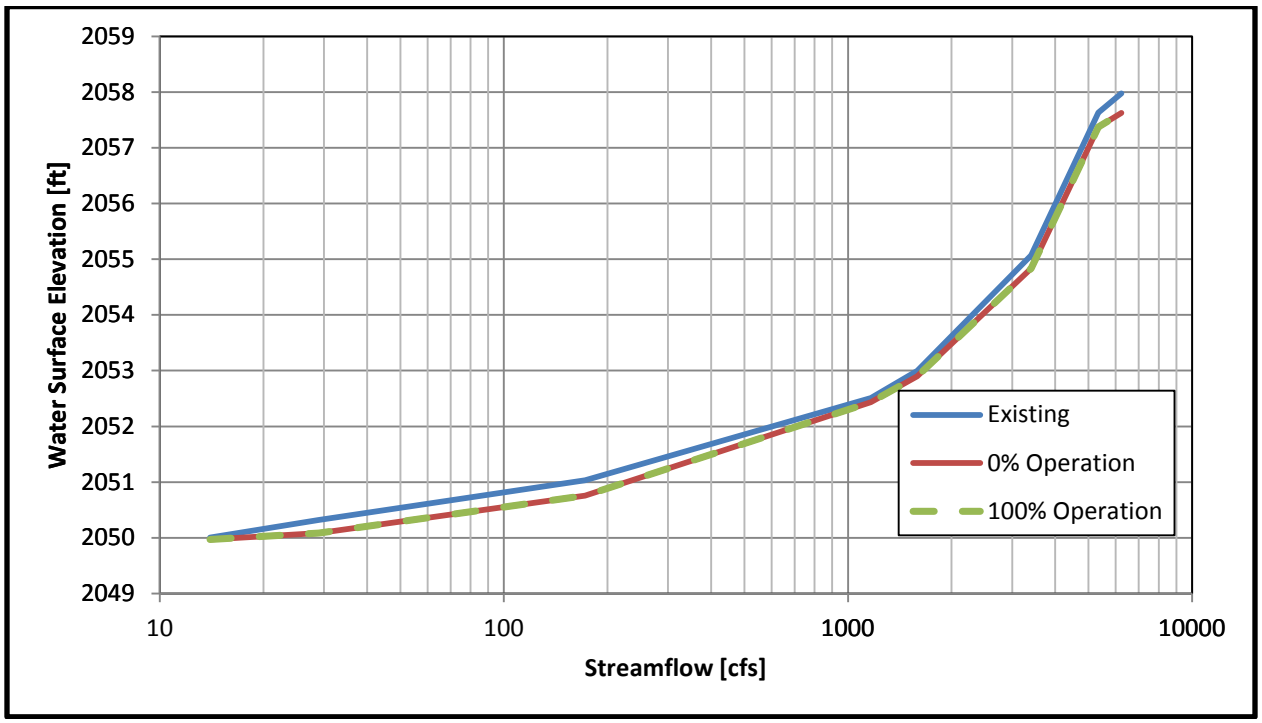

Figure 17. Comparison of rating curves for existing, 0% operation and 100% operation at main channel distance 400.10 ft.

7 References Cited

U.S. Army Corps of Engineers, 1993. "Engineer Manual 1110-2-1415: Hydrologic Frequency Analysis." Prepared by the U.S. Army Corps of Engineers, March 1993.

National Marine Fisheries Service, Northwest Region, 2008. "Anadromous Salmonid Passage Facility Design." Prepared by the National Marine Fisheries Service, February 2008.

Appendix A: Manning's n Calculations

Computation

HDR

Project	LOLO CREEK WEIR	Computed	MMF	Date	4/15/11
Subject	N VALUE CALCULATIONS	Checked		Date	
Task	MAIN CHANNEL	Sheet	1	Of	2

Stream:	LOLO CREEK
Location:	WEIPPE, IDAHO
Aerial Picture Attached:	no
Photographs:	yes

Is roughness uniform throughout the reach? YES

Note: If not, n-value should be assigned for the AVERAGE condition of the reach

Is roughness uniformly distributed along the cross section? NO

Is a division between the channel and floodplain necessary? YES

Calculation of n-value:

n = (nb + n1 + n2 + n3 + n4)m

where:	Description of Range
nb = base n value for surface	*median size btwn 1" and 2.5"=0.028 to 0.035, btwn 2.5" and 10"=0.030 to 0.050*
n1 = surface irregularity factor	*smooth = 0 up to severe at 0.020*
n2 = cross section variation factor	*gradual = 0 up to alternating frequently at 0.015*
n3 = obstructions factor	*negligible = 0 up to severe (over 50% of cross section) at 0.015*
n4 = vegetation factor	*small = 0.002 to very lg (av depth of flow is less than 1/2 height of veg) at 0.100*
m = sinuosity/meandering factor	*minor = 1.0, appreciable = 1.15, Severe = 1.30*

Base n value for surface

nb: Sand channel? NO if yes, median size of bed mat'l? NA

nb = **0.012**

median size (mm)	nb
0.2	0.012
0.3	0.017
0.4	0.020
0.5	0.022
0.6	0.023
0.8	0.025
1.0	0.026

All other channels:

nb = 0.035

median size (in)	nb
.04 to .08	0.026 to 0.035
1 to 2.5	0.028 to 0.035
2.5 to 10	0.030 to 0.050
>10	0.040 to 0.070

Notes: MEDIAN PARTICLE SIZE BASED UPON VISUAL OBSERVATION

Surface Irregularity

n1:	Smooth	Is channel smooth? NO *The channel consists of a sand base and is very flat and smooth.*	if yes, n1 = 0	
	Minor	Is channel in good condition with slightly eroded or scoured side slopes?	if yes, n1 = 0.001 - 0.005	YES
	Moderate	Is channel a dredged channel having moderate to considerable bed roughness and moderately sloughed or eroded side slopes in rock?	if yes, n1 = 0.006 - 0.010	NO
	Severe	Is channel badly sloughed, scalloped banks or badly eroded or sloughed sides or jagged and irregular surface?	if yes, n1 = 0.011 - 0.020	NO

n1 = 0.002

Notes: CHANNEL IS IN GOOD CONDITION. WITH MINOR EVIDENCE OF ERODED OR SCOURED SIDE SLOPES.

Cross Section Variation Factor				
n2:	Gradual	Does the size and shape of the channel cross section change gradually?	if yes, n2 = 0.000	NO
	Alternately occasionally	Does the cross section alternate to large to small, *occasionally* or does the main flow *occasionally* shift from side to side?	if yes, n2 = 0.001 - 0.005	YES
	Alternately frequently	Does the cross section alternate to large to small, *frequently* or does the main flow *frequently* shift from side to side?	if yes, n2 = 0.010 - 0.015	NO
		n2 =	0.002	
Notes:	THE EXISTING CHANNEL IS FAIRLY UNIFORM THROUGHOUT IT'S REACH.			
Obstructions factor				
n3:	Negligible	Does the stream have a few scattered obstructions that occupy < 5% of the cross-sectional area?	if yes, n3 = 0.000 - 0.004	YES
	Minor	Obstructions occupy < 15% of the cross-sectional area and the spacing btwn obstructions is such that the sphere of influence doesn't extend to other obstructions?	if yes, n3 = 0.005 - 0.015	NO
	Appreciable	Obstructions occupy 15% - 50% of the cross-sectional area and the spacing btwn obstructions is small enough to be additive?	if yes, n3 = 0.020 - 0.030	NO
	Severe	Obstructions occupy more than 50% of the cross-sectional area or the spacing btwn obstructions causes turbulence?	if yes, n3 = 0.040 - 0.050	NO
		n3 =	0.003	
Notes:	OBSTRUCTIONS INCLUDE MEDIAL GRAVEL BARS AND BOULDERS.			
Vegetation factor				
n4:	Small	Does the channel have dense growth of flexible turf grass or weed growth where the flow is at least 2 times the hght of the vegetation; tree seedlings of willows, cottonwoods, etc?	if yes, n4 = 0.002 - 0.010	NO
	Medium	Does the channel have turf grass where the ave depth of flow is 1 to 2 times the hght of the vegetation; moderately stemmy grass, weeds or tree seedlings growing where the flow is 2 to 3 times the height of the vegetation?	if yes, n4 = 0.010 - 0.025	NO
	Large	Does the channel where the ave. depth of flow is equal to the hght of the vegetation; 8 to 10 y.o. willows, cottonwoods intergrown with weeds and brush; where the R = 0.6 m (1.97 ft) or bushy willows of 1 y.o.are in the channel bottom, where R = 0.61 (2.0	if yes, n4 = 0.025 -0.050	NO
	Very large	Does the channel have turf grass growing where the ave depth of flow < 1/2 the hght of the vegetation; bushy willows about 1 y.o. with weeds intergrown on side slopes; dense cattails in channel btm; trees intergrown with weeds and brush?	if yes, n4 = 0.050 - 0.100	NO
		n4 =	0.000	
Notes:	NO VEGETATION IN MAIN CHANNEL			
Sinuosity/meandering factor				
m	Minor	Ratio of the channel length to valley length in 1.0 to 1.2	if yes, m = 1.00	YES
	Appreciable	Ratio of the channel length to valley length in 1.2 to 1.5	if yes, m = 1.15	NO
	Severe	Ratio of the channel length to valley length > 1.5	if yes, m = 1.30	NO
		m =	1.00	
Notes:	Ratio of channel length to valley length			
	Channel length	1158		
	Valley length	1000		
	Ratio =	1.16		
		n =	0.042	

Computation

Project	LOLO CREEK WEIR	Computed	MMF	Date	4/15/11
Subject	N VALUE CALCULATIONS	Checked		Date	
Task	LEFT OVERBANK 0+00 TO 38+00	Sheet	1	Of	2

Stream: LOLO CREEK
Location:
Aerial Picture Attached: no
Photographs: yes

Is roughness uniform throughout the reach? NO
Note: If not, n-value should be assigned for the AVERAGE condition of the reach

Is roughness uniformly distributed along the cross section? NO
Is a division between the channel and floodplain necessary? YES

Calculation of n-value:
n = (nb + n1 + n2 + n3 + n4)m

where:	Description of Range
nb = base n value for surface	*median size btwn 1" and 2.5"=0.028 to 0.035, btwn 2.5" and 10"=0.030 to 0.050*
n1 = surface irregularity factor	*smooth = 0 up to severe at 0.020*
n2 = cross section variation factor	*gradual = 0 up to alternating frequently at 0.015*
n3 = obstructions factor	*negligible = 0 up to severe (over 50% of cross section) at 0.015*
n4 = vegetation factor	*small = 0.002 to very lg (av depth of flow is less than 1/2 height of veg) at 0.100*
m = sinuosity/meandering factor	*minor = 1.0, appreciable = 1.15, Severe = 1.30*

Base n value for surface

nb: Sand channel? No if yes, median size of bed mat'l? _____

nb =

median size (mm)	nb
0.2	0.012
0.3	0.017
0.4	0.020
0.5	0.022
0.6	0.023
0.8	0.025
1.0	0.026

All other channels:

median size (in)	nb
.04 to .08	0.026 to 0.035
1 to 2.5	0.028 to 0.035
2.5 to 10	0.030 to 0.050
>10	0.040 to 0.070

nb = 0.035

Notes: The ground surface consists of mostly cobbles.

Surface Irregularity

n1:	Smooth	Is channel smooth? NO *Compares to the smoothest, flattest floodplain in a given bed material.*	if yes, n1 = 0	
	Minor	Is channel in good condition with slightly eroded or scoured side slopes? *The ground surface is fairly flat - roaming hills.*	if yes, n1 = 0.001 - 0.005	YES
	Moderate	Is channel a dredged channel having moderate to considerable bed roughness and moderately sloughed or eroded side slopes in rock?	if yes, n1 = 0.006 - 0.010	NO
	Severe	Is channel badly sloughed, scalloped banks or badly eroded or sloughed sides or jagged and irregular surface?	if yes, n1 = 0.011 - 0.020	NO

n1 = 0.001

Notes: MINOR IRREGULARITY THROUGHOUT REACH

Cross Section Variation Factor				
n2:	Gradual	Does the size and shape of the channel cross section change gradually?	if yes, n2 = 0.000	NO
	Alternately occasionally	Does the cross section alternate to large to small, *occasionally* or does the main flow *occasionally* shift from side to side? *The cross-section of this area is generally fairly wide.*	if yes, n2 = 0.001 - 0.005	YES
	Alternately frequently	Does the cross section alternate to large to small, *frequently* or does the main flow *frequently* shift from side to side?	if yes, n2 = 0.010 - 0.015	NO
		n2 =	0.002	
Notes:	CROSS SECTION REMAINS FAIRLY CONSTANT THROUGHOUT REACH			
Obstructions factor				
n3:	Negligible	Does the stream have a few scattered obstructions that occupy < 5% of the cross-sectional area?	if yes, n3 = 0.000 - 0.004	YES
	Minor	Obstructions occupy < 15% of the cross-sectional area and the spacing btwn obstructions is such that the sphere of influence doesn't extend to other obstructions?	if yes, n3 = 0.005 - 0.015	NO
	Appreciable	Obstructions occupy 15% - 50% of the cross-sectional area and the spacing btwn obstructions is small enough to be additive?	if yes, n3 = 0.020 - 0.030	NO
	Severe	Obstructions occupy more than 50% of the cross-sectional area or the spacing btwn obstructions causes turbulence?	if yes, n3 = 0.040 - 0.050	NO
		n3 =	0.004	
Notes:	STRUCTURES AND DEBRIS EXISTING ALONG THE LEFT OVERBANK. THESE OBSTRUCTIONS ARE CLASSIFIED AS MINOR.			
Vegetation factor				
n4:	Small	Does the channel have dense growth of flexible turf grass or weed growth where the flow is at least 2 times the height of the vegetation; tree seedlings of willows, cottonwoods, etc?	if yes, n4 = 0.002 - 0.010	NO
	Medium	Does the channel have turf grass where the ave depth of flow is 1 to 2 times the height of the vegetation; moderately stemmy grass, weeds or tree seedlings growing where the flow is 2 to 3 times the height of the vegetation?	if yes, n4 = 0.010 - 0.025	NO
	Large	Does the channel where the ave. depth of flow is equal to the height of the vegetation; 8 to 10 y.o. willows, cottonwoods intergrown with weeds and brush; where the R = 0.6 m (1.97 ft) or bushy willows of 1 y.o.are in the channel bottom, where R = 0.61 (2	if yes, n4 = 0.025 -0.050	YES
	Very large	Does the channel have turf grass growing where the ave depth of flow < 1/2 the hght of the vegetation; bushy willows about 1 y.o. with weeds intergrown on side slopes; dense cattails in channel btm; trees intergrown with weeds and brush?	if yes, n4 = 0.050 - 0.100	NO
		n4 =	0.040	
Notes:	TREES AND SHRUBS EXIST HEAVILY THOUGHOUT THE LOWER REACH			
Sinuosity/meandering factor				
m	Minor	Ratio of the channel length to valley length in 1.0 to 1.2	if yes, m = 1.00	YES
	Appreciable	Ratio of the channel length to valley length in 1.2 to 1.5	if yes, m = 1.15	NO
	Severe	Ratio of the channel length to valley length > 1.5	if yes, m = 1.30	NO
		m =	1.00	
Notes:	Ratio of channel length to valley length			
	Channel length	1158		
	Valley length	1100		
	Ratio =	1.05		
		n =	0.082	

Computation

Project	LOLO CREEK WEIR	Computed	MMF	Date	4/15/11
Subject	N VALUE CALCULATIONS	Checked		Date	
Task	RIGHT OVERBANK 38+00 TO 106+00	Sheet	1	Of	2

Stream: LOLO CREEK
Location:
Aerial Picture Attached: no
Photographs: YES

Is roughness uniform throughout the reach? NO
Note: If not, n-value should be assigned for the AVERAGE condition of the reach

Is roughness uniformly distributed along the cross section? NO
Is a division between the channel and floodplain necessary? YES

Calculation of n-value:
n = (nb + n1 + n2 + n3 + n4)m

where:	Description of Range
nb = base n value for surface	*median size btwn 1" and 2.5"=0.028 to 0.035, btwn 2.5" and 10"=0.030 to 0.050*
n1 = surface irregularity factor	*smooth = 0 up to severe at 0.020*
n2 = cross section variation factor	*gradual = 0 up to alternating frequently at 0.015*
n3 = obstructions factor	*negligible = 0 up to severe (over 50% of cross section) at 0.015*
n4 = vegetation factor	*small = 0.002 to very lg (av depth of flow is less than 1/2 height of veg) at 0.100*
m = sinuosity/meandering factor	*minor = 1.0, appreciable = 1.15, Severe = 1.30*

Base n value for surface

nb: Sand channel? No if yes, median size of bed mat'l? _____

nb =

median size (mm)	nb
0.2	0.012
0.3	0.017
0.4	0.020
0.5	0.022
0.6	0.023
0.8	0.025
1.0	0.026

All other channels:

median size (in)	nb
.04 to .08	0.026 to 0.035
1 to 2.5	0.028 to 0.035
2.5 to 10	0.030 to 0.050
>10	0.040 to 0.070

nb = 0.035

Notes: The ground surface consists of mostly cobbles.

Surface Irregularity

n1:	Smooth	Is channel smooth? NO *Compares to the smoothest, flattest floodplain in a given bed material.*	if yes, n1 = 0	
	Minor	Is channel in good condition with slightly eroded or scoured side slopes? *The ground surface is fairly flat - roaming hills.*	if yes, n1 = 0.001 - 0.005	YES
	Moderate	Is channel a dredged channel having moderate to considerable bed roughness and moderately sloughed or eroded side slopes in rock?	if yes, n1 = 0.006 - 0.010	NO
	Severe	Is channel badly sloughed, scalloped banks or badly eroded or sloughed sides or jagged and irregular surface?	if yes, n1 = 0.011 - 0.020	NO

n1 = 0.001

Notes: MINOR IRREGULARITY THROUGHOUT REACH

Cross Section Variation Factor				
n2:	Gradual	Does the size and shape of the channel cross section change gradually?	if yes, n2 = 0.000	NO
	Alternately occasionally	Does the cross section alternate to large to small, *occasionally* or does the main flow *occasionally* shift from side to side? *The cross-section of this area is generally fairly wide.*	if yes, n2 = 0.001 - 0.005	YES
	Alternately frequently	Does the cross section alternate to large to small, *frequently* or does the main flow *frequently* shift from side to side?	if yes, n2 = 0.010 - 0.015	NO
		n2 =	0.001	
Notes:	CROSS SECTION REMAINS FAIRLY CONSTANT THROUGHOUT REACH			
Obstructions factor				
n3:	Negligible	Does the stream have a few scattered obstructions that occupy < 5% of the cross-sectional area?	if yes, n3 = 0.000 - 0.004	YES
	Minor	Obstructions occupy < 15% of the cross-sectional area and the spacing btwn obstructions is such that the sphere of influence doesn't extend to other obstructions?	if yes, n3 = 0.005 - 0.015	NO
	Appreciable	Obstructions occupy 15% - 50% of the cross-sectional area and the spacing btwn obstructions is small enough to be additive?	if yes, n3 = 0.020 - 0.030	NO
	Severe	Obstructions occupy more than 50% of the cross-sectional area or the spacing btwn obstructions causes turbulence?	if yes, n3 = 0.040 - 0.050	NO
		n3 =	0.003	
Notes:	STRUCTURES AND DEBRIS EXISTING ALONG THE RIGHT OVERBANK. THESE OBSTRUCTIONS ARE CLASSIFIED AS MINOR.			
Vegetation factor				
n4:	Small	Does the channel have dense growth of flexible turf grass or weed growth where the flow is at least 2 times the height of the vegetation; tree seedlings of willows, cottonwoods, etc?	if yes, n4 = 0.002 - 0.010	NO
	Medium	Does the channel have turf grass where the ave depth of flow is 1 to 2 times the height of the vegetation; moderately stemmy grass, weeds or tree seedlings growing where the flow is 2 to 3 times the height of the vegetation?	if yes, n4 = 0.010 - 0.025	NO
	Large	Does the channel where the ave. depth of flow is equal to the height of the vegetation; 8 to 10 y.o. willows, cottonwoods intergrown with weeds and brush; where the R = 0.6 m (1.97 ft) or bushy willows of 1 y.o.are in the channel bottom, where R = 0.61 (2	if yes, n4 = 0.025 -0.050	NO
	Very large	Does the channel have turf grass growing where the ave depth of flow < 1/2 the hght of the vegetation; bushy willows about 1 y.o. with weeds intergrown on side slopes; dense cattails in channel btm; trees intergrown with weeds and brush?	if yes, n4 = 0.050 - 0.100	NO
		n4 =	0.010	
Notes:	TREES AND SHRUBS EXIST MODERATELY ALONG THE RIGHT OVERBANK. UNDER GROWTH IS COMPOSED PRIMARILY OF PERRENIAL GRASSES.			
Sinuosity/meandering factor				
m	Minor	Ratio of the channel length to valley length in 1.0 to 1.2	if yes, m = 1.00	YES
	Appreciable	Ratio of the channel length to valley length in 1.2 to 1.5	if yes, m = 1.15	NO
	Severe	Ratio of the channel length to valley length > 1.5	if yes, m = 1.30	NO
		m =	1.00	
Notes:	Ratio of channel length to valley length			
	Channel length	1158		
	Valley length	1100		
	Ratio =	1.05		
		n =	0.050	

Appendix C
Wetland and Stream Delineation Report

Bonneville Power Administration

Lolo Creek Nez Perce Tribe Permanent Fish Weir Project: Lower Lolo Creek Weir, RM 12

WETLAND AND STREAM DELINEATION REPORT

Submitted by
U.S. Department of Energy
Bonneville Power Administration

October 2011

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Table of Contents

Attachments ii

List of Tables ii

List of Figures ii

1.0 Introduction and Background 1

2.0 Methods 4

2.1 Study Area 4
2.2 Review of Existing Information 4
2.3 Field Investigation 4
Wetlands 6
Streams 6

3.0 Results 10

3.1 General Site Conditions 10
3.2 Wetlands 10
3.3 Streams 12

4.0 Project Effects 16

4.1 Wetland Impacts 16
4.2 Stream Impacts 16
4.3 Riparian Habitat Enhancements 18

5.0 References Cited 19

Attachments

A. Wetland Delineation Methodology A-1
B. Wetland Delineation Data Forms B-1
C. Wetland Functional Assessment Forms C-1
D. Project Photographs D-1

List of Tables

Table 1. IDEQ State-Designated Use Descriptions (IDAPA 58.01.02.100) 8
Table 2. Antidegredation Policy Designation (IDAPA 58.01.02.051) 9
Table 3. IDEQ (2009, 2010) 303(d)/305(b) Integrated List Water Categorization 9
Table 4. Wetland Size, Rating, and Classification for Wetlands in the Study Area 11
Table 5. Summary of Streams in the Study Area. 13
Table 6. Lolo Creek Average Monthly Flows (cfs) as Measured at Lolo Creek Bridge (2005-2009[1]). 15
Table 7. Proposed Planting Palette for Aquatic Area Buffer Enhancement 18

List of Figures

Figure 1. Location of Project Site 3
Figure 2. Existing Conditions at Lower Lolo Creek Weir Location 5
Figure 3. Lolo Creek Permanent Fish Weir, Proposed Site Plan. 17

1.0 Introduction and Background

The Bonneville Power Administration (BPA) and Nez Perce Tribe (NPT) are proposing to replace an existing seasonal picket weir/adult collection facility currently located at approximately river mile (RM) 12 of Lolo Creek, a tributary to the Clearwater River in north-central Idaho (Figure 1). Specifically, the existing seasonal picket weir, referred to throughout this document as the Lower Lolo Weir is located on a 2.4 acre right-of-way granted to the Nez Perce Tribe from the Bureau of Land Management (BLM). The site is within Section 17, Township 34N, Range 4E, Boise Meridian (latitude 46.17383; longitude -115.58308, approximately 10 miles south/southwest of Weippe, Idaho. Elevations in the vicinity of the study area range from 2045 to 2080 feet (ft) mean sea level (MSL). The right bank of Lolo Creek represents the border between Clearwater and Idaho counties. As such, instream elements of the existing weir span both counties, while facilities along the right bank (trailers, portapotties, access road, etc.) are within Clearwater County. The project site is accessed via the Woodland Grade/Lolo Creek Road.

The existing Lower Lolo Weir is operated by the NPT under a special use permit from the (BLM to collect spring/summer Chinook broodstock for the Nez Perce Tribal Hatchery (NPTH), and has been in operation since 2002. The seasonal weir is typically installed about 50 ft downstream of an existing county bridge, locally known as the Lolo Creek (or Woodland) Bridge.

The current operational period of Lower Lolo Weir is about mid-May through September. During this period, emigrating spring Chinook adults are captured at the weir and either: 1) collected for NPTH broodstock, 2) passed up-river to spawn, or, 3) removed from the system (strays from non-NPTH). The data from these fish combined with juvenile data collected at an on-site screw trap facility are used to derive performance measures that include: parent-to-progeny ratio, natural adult to smolt ratio, smolt-to-adult ratio, pedigree, relative reproductive success, and abundance and survival rates. These performance measures, in turn, are used to assess the impact of supplementation on achieving the NPTH goal of promoting natural production in Lolo Creek.

The weir was originally used to monitor the success of NPT coho salmon introductions within the drainage (BLM 2001); however, after several years of weir operations, no coho were ever captured at the site (S. Sprague, NPT, pers. comm.). As a result, the NPT no longer operates the weir during the October/November run timing period for coho and there are currently no plans to re-establish this monitoring program.

The current weir is installed manually by NPT staff, typically when flows fall below 500 cubic feet per second (cfs). Installation during flows that exceed 500 cfs is not feasible, as it jeopardizes the safety of staff and the integrity of the weir itself. Although the existing weir functions adequately during flows below 500 cfs, it cannot be installed or operated during high flow events (primarily the months of May and June) when spring Chinook begin their upstream migrations. During the months of May and June, flows are usually too high to operate the picket weir, making collection of 100% of the Chinook run impossible. This, therefore, restricts the

number and genetic variety of adults collected for broodstock and hinders monitoring of the returning spring Chinook population.

Lolo Creek was identified for habitat status and trend monitoring in the May 2010 Recommendations for Implementing Research, Monitoring and Evaluation for the 2008 National Marine Fisheries Service's (NMFS) Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp) document. As a result of the Columbia Basin Anadromous Salmonid Monitoring Strategy, NMFS has requested that this weir location be utilized to monitor steelhead to meet FCRPS BiOp Adaptive Management Implementation Plan (AMIP; NMFS 2009a) fish in/fish out requirements. This represents a modification to the facility's objectives, and an extension of the operational period as the weir currently does not operate during the adult steelhead migrational period (winter/spring).

The proposed project considered in this document is the installation and operation of a permanent weir and trapping facility on Lolo Creek to monitor and evaluate adult returns for steelhead and spring Chinook salmon, and to collect NPTH spring Chinook broodstock and supplementation evaluation data. This project is part of the Northwest Power and Conservation Council's (NPCC) Fish &Wildlife Program. The proposed action also includes upgrades to the site, including the addition of infrastructure to support trapping and monitoring operations. In addition, the proposed action will accommodate continued recreational use of the property and will include the addition of take-out and put-in areas along the right bank of Lolo Creek and designated kayaker parking areas landward of Lolo Creek.

This report describes the methods and findings of wetland and stream delineations for the Lolo Creek NPT Fish Weir project. The report was prepared by HDR Engineering, Inc. (HDR) biologists, and is intended to provide documentation for applicable local, state, and federal permitting activities required for construction of the project.

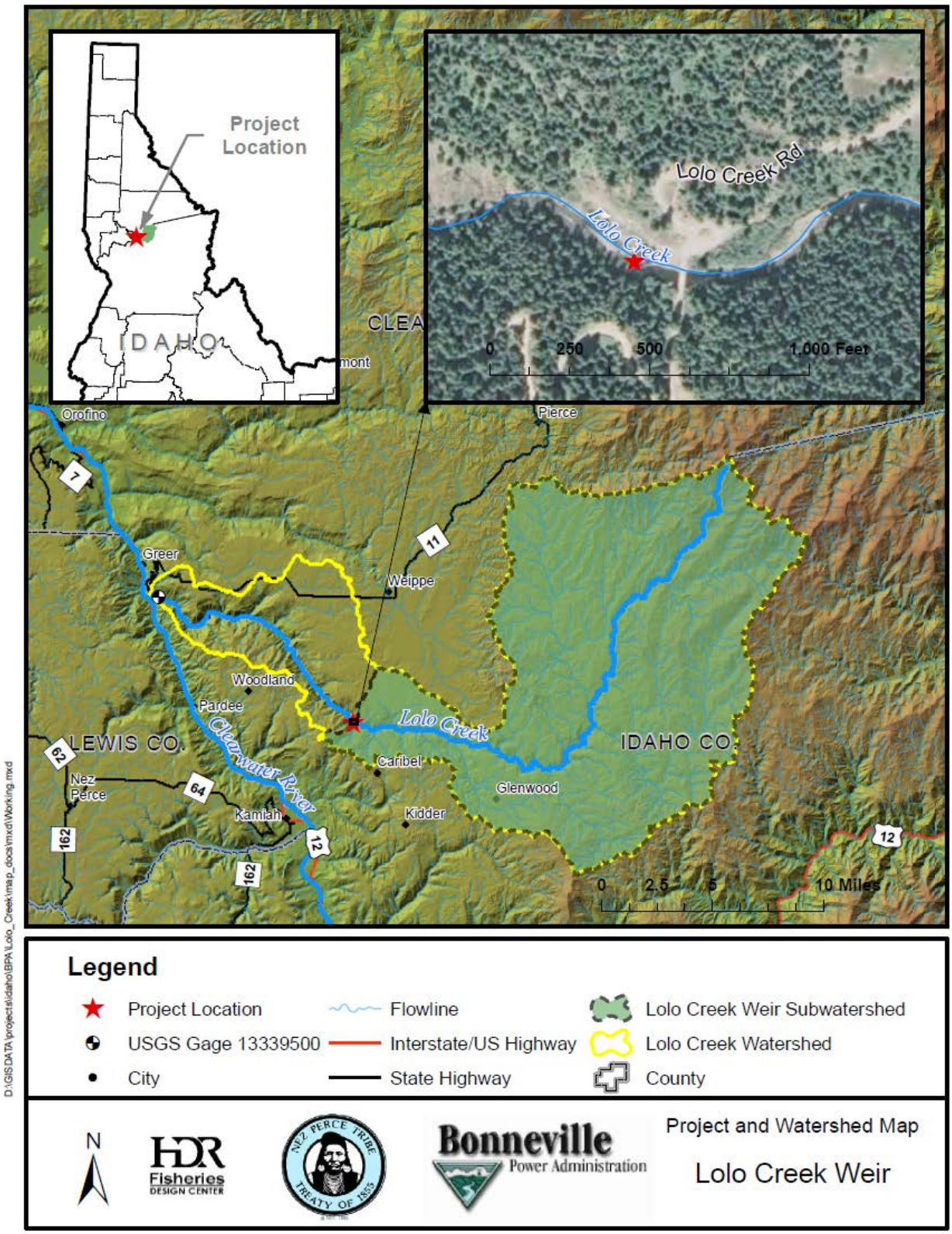

Figure 1. Location of Project Site

2.0 Methods

2.1 Study Area

For the purposes of this document, the study area encompasses the reach of Lolo Creek and the riparian corridor within the proposed BLM right-of-way (Figure 2). Wetlands and streams outside the study area were not formally delineated; these areas were assessed based on characteristics visible from public rights-of-way and on information obtained from existing documents and studies, maps, and aerial photographs.

Streams and potential wetlands in the study area were identified through a two-step process. HDR biologists first reviewed existing documents, including soil surveys, wetland and stream inventories, aerial photographs, and other reports that concern wetlands and streams in the project vicinity. After this review, HDR biologists completed a thorough field investigation of the study area that included wetland and stream identification, delineation, and classification.

2.2 Review of Existing Information

Existing documents reviewed for this wetland and stream study included the following:

- Soil Survey of Idaho and Clearwater County Areas, Idaho (USDA NRCS 2011)
- U.S. Fish and Wildlife Service (USFWS 2011) National Wetland Inventory Web site
- Idaho Department of Fish and Game (IDFG 2011) Fish and Wildlife Information System
- HDR (2011) Draft Biological Assessment
- Federal Emergency Management Agency (FEMA 1991) Flood Insurance Rate Map for Idaho County
- Idaho Department of Environmental Quality (IDEQ 2010a) Idaho Antidegradation Implementation Procedure
- IDEQ (2009) Working Principles and Policies for the 2008 Integrated (303[d]/305[b]) Report
- IDEQ (2010b) Principles and Policies for the 2010 Integrated Report – DRAFT
- A Conservation Assessment for Lolo Creek Canyon, Clearwater and Idaho Counties, Idaho (Mancuso 1996)

These documents provide background information on the soils, hydrology, land use, streams, and potential wetlands in the study area.

2.3 Field Investigation

Field investigation consisted of a detailed investigation of streams and potential wetlands in the study area, which was conducted on June 22, 2011. In the week prior to the field investigation, there had been approximately 0.1 inches of rainfall in the project region (National Oceanic and Atmospheric Administration [NOAA] National Weather Service [NWS] 2011). Temperatures were generally within normal ranges for June (NOAA NWS 2011, USDA NRCS 2003). Precipitation in April 2011 was below normal in the region, whereas May 2011 precipitation was above normal (NOAA NWS 2011, USDA NRCS 2003).

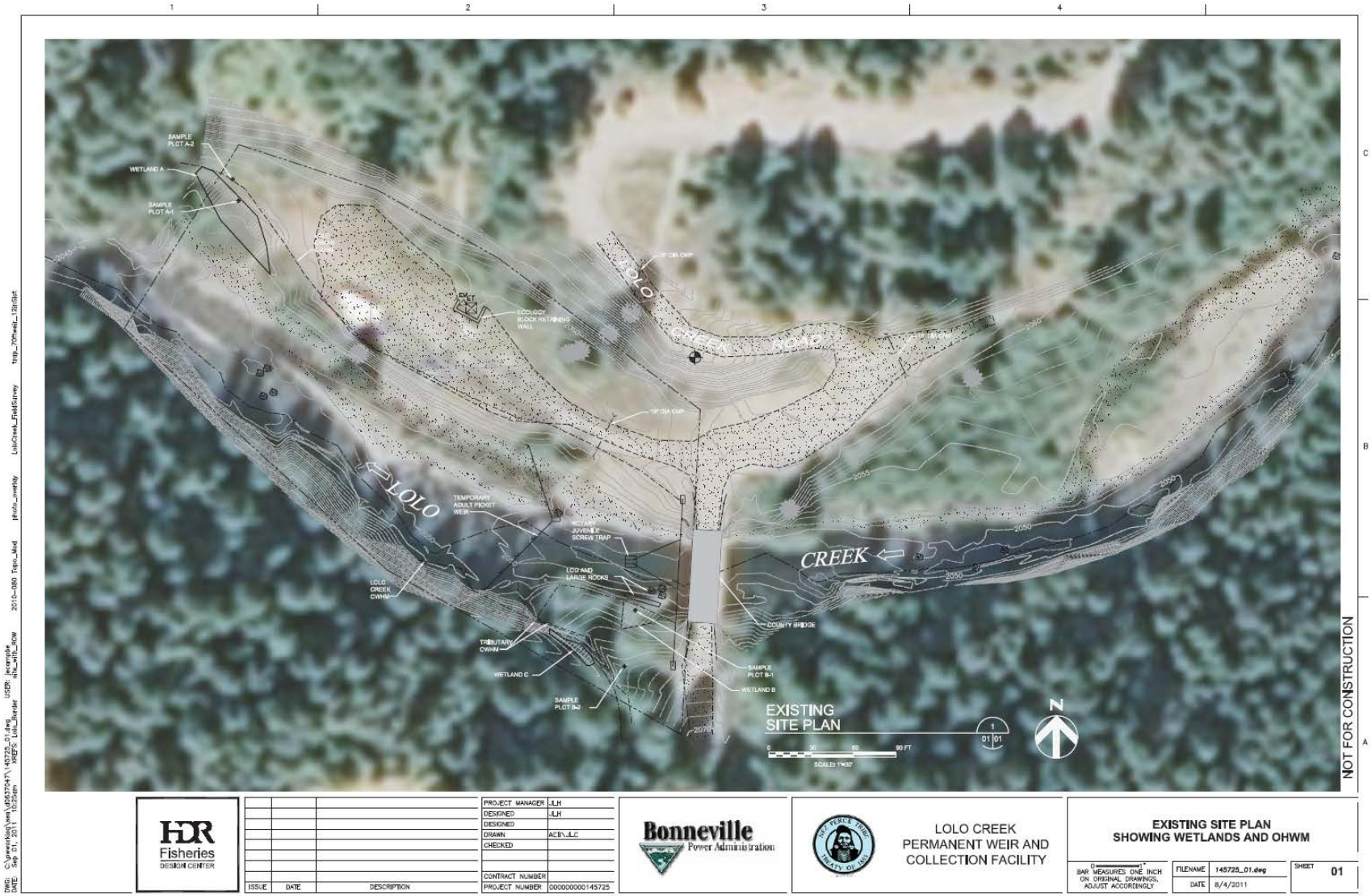

Figure 2. Existing Conditions at Lower Lolo Creek Weir Location

Wetlands

HDR staff investigated the project site for wetlands using the three parameter methods described in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), as updated by the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region* (U.S. Army Corps of Engineers [USACE] 2010). A detailed description of the field methods used in this study is provided in Attachment A. Wetland boundaries and data plot locations in the study area were marked in the field using a Trimble GeoXT 2005 GPS device, which is capable of sub meter accuracy. The resulting data were incorporated into project base maps as well as the previous survey data.

Neither the state of Idaho, Idaho County, nor Clearwater County has codified a method to assess wetland functions and values. For the purposes of this study, the Montana Department of Transportation (MDOT 2008) Wetland Assessment Method was used to assess wetland functions in the study area. The assessment method considers the following 12 functions and value variables, and rates each variable as low, moderate, or high for the wetland being assessed:

- Habitat for Federally listed or proposed threatened or endangered plants or animals
- Habitat for animals rated S1, S2, or S3 by Natural Heritage Program
- General wildlife habitat
- General fish/aquatic habitat
- Flood attenuation
- Long and short-term surface water storage
- Sediment/nutrient/toxicant retention and removal
- Sediment/shoreline stabilization
- Production export/food chain support
- Groundwater discharge/recharge
- Uniqueness
- Recreation/education potential

Ratings range from Category I (highest) to Category IV (lowest). A detailed analysis of wetland functions is not included in this report; however, a brief description of wetland functions based on the MDOT (2008) assessment method is provided in the general description for each wetland.

Streams

In order to determine the ordinary high water mark (OHWM) on Lolo Creek, HDR utilized USACE (2005) guidance for OHWM identification, which is also consistent with the "Mean High Water Mark" definition under Idaho Stream Channel Alteration Rules (§37.03.07.010). USACE (2005) defines "ordinary high water mark" as: "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas." HDR staff looked for physical indicators including, but not limited to, a natural line impressed on the bank, destruction of terrestrial vegetation, presence of litter and debris, vegetation matted down, bent or absent, scour, and bed and banks. The OHWM was marked in the field using the GeoXT 2005 GPS receiver.

Streams identified in the study area were classified according to criteria anticipated to be evaluated for permit approval, including the Stream Alteration Permit (administered by Idaho Department of Water Resources) and Section 401 water quality certification (administered by IDEQ). Stream designation descriptions under applicable state laws are identified in Tables 1 through 3.

Table 1. IDEQ State-Designated Use Descriptions (IDAPA 58.01.02.100)

State-Designated Use (Code)	State-Designated Use Description
Aquatic Life – Cold Water (COLD)	Water quality appropriate for the protection and maintenance of a viable aquatic life community for cold water species.
Aquatic Life – Salmonid Spawning (SS)	Waters which provide or could provide a habitat for active self-propagating populations of salmonid fishes.
Aquatic Life – Seasonal cold water (SC)	Water quality appropriate for the protection and maintenance of a viable aquatic life community of cool and cold water species, where cold water aquatic life may be absent during, or tolerant of, seasonally warm temperatures.
Aquatic Life - Warm water (WARM)	Water quality appropriate for the protection and maintenance of a viable aquatic life community for warm water species.
Aquatic Life - Modified (MOD)	Water quality appropriate for an aquatic life community that is limited due to one (1) or more conditions set forth in 40 CFR 131.10(g) which preclude attainment of reference streams or conditions.
Recreation - Primary contact recreation (PCR)	Water quality appropriate for prolonged and intimate contact by humans or for recreational activities when the ingestion of small quantities of water is likely to occur. Such activities include, but are not restricted to, those used for swimming, water skiing, or skin diving.
Recreation - Secondary contact recreation (SCR)	Water quality appropriate for recreational uses on or about the water and which are not included in the primary contact category. These activities may include fishing, boating, wading, infrequent swimming, and other activities where ingestion of raw water is not likely to occur.
Water Supply – Domestic (DWS)	Water quality appropriate for drinking water supplies.
Water Supply - Agricultural	Water quality appropriate for the irrigation of crops or as drinking water for livestock. This use applies to all surface waters of the state.
Water Supply - Industrial	Water quality appropriate for industrial water supplies. This use applies to all surface waters of the state.
Wildlife Habitats	Water quality appropriate for wildlife habitats. This use applies to all surface waters of the state.
Aesthetics	This use applies to all surface waters of the state.
Special Resource Water	Waters of the state may be designated as special resource waters. Designation as a special resource water recognizes at least one (1) of the following characteristics: (a) The water is of outstanding high quality, exceeding both criteria for primary contact recreation and cold water aquatic life; (b)The water is of unique ecological significance; (c) The water possesses outstanding recreational or aesthetic qualities; (d) Intensive protection of the quality of the water is in paramount interest of the people of Idaho; (e) The water is a part of the National Wild and Scenic River System, is within a State or National Park or wildlife refuge and is of prime or major importance to that park or refuge; or (f). Intensive protection of the quality of the water is necessary to maintain an existing, but jeopardized beneficial use.
Undesignated Surface Waters	Surface waters not designated in Sections 110 through 160 shall be designated according to Section 39-3604, Idaho Code, taking into consideration the use of the surface water and such physical, geological, chemical, and biological measures as may affect the surface water. Prior to designation, undesignated waters shall be protected for beneficial uses, which include all recreational use in and on the water and the protection and propagation of fish, shellfish, and wildlife, wherever attainable. Because the Department presumes most waters in the state will support cold water aquatic life and primary or secondary contact recreation beneficial uses, the Department will apply cold water aquatic life and primary or secondary contact recreation criteria to undesignated waters unless Sections 101.01.b and 101.01c. are followed.

Table 2. Antidegredation Policy Designation (IDAPA 58.01.02.051)

Protection Designation	Description
Tier I	Maintenance of Existing Uses for All Waters. The existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
Tier II	High Quality Waters. Where the quality of the waters exceeds levels necessary to support propagation of fish, shellfish and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the Department finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the Department's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the Department shall assure water quality adequate to protect existing uses fully. Further, the Department shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and cost-effective and reasonable best management practices for nonpoint source control. In providing such assurance, the Department may enter together into an agreement with other state of Idaho or federal agencies in accordance with Sections 67-2326 through 67-2333, Idaho Code.
Tier III	Outstanding Resource Waters. Where high quality waters designated by the legislature constitute an outstanding national resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected from the impacts of point and nonpoint source activities.

Table 3. IDEQ (2009, 2010) 303(d)/305(b) Integrated List Water Categorization

Water Category	Description
Category 1	Waters are attaining water quality standards and no uses are threatened
Category 2	Waters are attaining some designated uses, and no uses are threatened, but there is insufficient (or no) data and information available to determine if the remaining uses are attained or threatened.
Category 3	Waters have insufficient data (or no data) and information to enable determining if designated uses are being attained.
Category 4	Waters do not support (or threaten) a standard for one or more designated uses, but they do not require the development of a Total Maximum Daily Load (TMDL). There are three subcategories under Category 4: (1) Category 4a waters have had a TMDL completed and approved by EPA. (2) Category 4b waters have had pollution control requirements placed on them— other than a TMDL—and these waters are reasonably expected to attain the water quality standard in the near future. (3) Category 4c waters are those waters for which nonsupport of the water quality standard is not caused by a pollutant.
Category 5	Waters do not meet (or threaten) applicable water quality standards for one or more designated uses by one or more pollutants. Category 5 water bodies make up the 303(d) list of impaired waters.

3.0 Results

3.1 General Site Conditions

Lolo Creek area is considered part of the Northern Rockies Ecoregion of the Pacific Northwest (Mancuso 1996). Vegetation within the Lolo Creek basin is dominated by coniferous forests. The steep south-facing slopes on the north side of the canyon support ponderosa pine woodlands interspersed with rocky, grassy openings, and sparsely vegetated cliffs and rock outcrops. Herbaceous vegetation dominates the pine understory. Shrubs are uncommon, except in draws, or in association with some other rocky habitats. Near RM 12, pine woodlands give way to mixed conifer forest communities. Douglas-fir and grand fir become the dominant or co-dominant conifers in most places, along with ponderosa pine. This change to mixed conifer vegetation coincides with the point where timber harvesting has been widespread.

The steep north-facing slopes on the south side of the canyon support a closed canopy Douglas-fir forest along the lower half of the study area. Mallow ninebark (*Physocarpus malvaceus*), common snowberry (*Symphoricarpos albus*), oceanspray (*Holodiscus discolor*), Rocky Mountain maple (*Acer glabrum*), and other deciduous trees and shrubs are common in the understory and large rock outcrops are frequent along the canyon face. Riparian vegetation is best developed in floodplain areas. Within the vicinity of thestudy area, speckled alder (*Alnus incana*), black cottonwood (*Populus trichocarpa*), Pacific ninebark (*Physocarpus capitatus*), or other deciduous tall shrubs are common in floodplain zones further upstream. The strongly confined channel of Lolo Creek along the lower half of the project area prevents development of much floodplain habitat. This stretch is characterized by an often indistinct thin band of riparian shrubs intermixing with upland conifer species (Mancuso 1996).

The Lower Lolo Weir site is a popular summer recreational area (swimming, fishing) and is one of the few locations in the lower Lolo Creek drainage with public vehicular access. The flat area north of the creek has been heavily disturbed and appears to have been historically used as a landing.

3.2 Wetlands

HDR biologists identified and delineated three wetlands (Wetlands A, B and C) within the study area. Wetlands were distinguished from adjoining uplands by the presence of indicators for wetland hydrology, hydric soils, and hydrophytic vegetation. Wetland delineation data sheets are provided in Attachment B, functional assessment forms are provided in Attachment C, and photographs are provided in Attachment D. The locations of wetlands, streams, and data plots are shown in Figure 2. Table 3 summarizes the size, rating, and classification of wetlands found within the study area.

Table 4. Wetland Size, Rating, and Classification for Wetlands in the Study Area

Wetland Name	Wetland Size	Hydrogeomorphic (HGM) Classification[a]	Cowardin Classification[c]	MDOT (2008) Wetland Category[c]
A	0.11 acre (5,100 s.f.)	Riverine	PEM1	III
B	0.03 acre (1,230 s.f.)	Slope	PSS1	IV
C	0.02 acre (710 s.f.)	Slope	PSS1	IV

Notes:
[a] From Brinson (1993)
[b] Cowardin et al. (1979). PSS1 = palustrine forested broad-leaved deciduous; PEM1 = palustrine emergent persistent
[c] All ratings shown in this table are preliminary.

Wetland A

Palustrine emergent persistent
Category III
0.11 acre total

Wetland A is a riverine wetland located on the right bank and within the OHWM of Lolo Creek (Figure 2). Wetland A extends approximately 180 feet along the right bank of Lolo Creek. Because it lies below the OHWM of Lolo Creek, seasonal flooding and interstitial water from the Lolo Creek are the primary sources of wetland hydrology for Wetland A.

Wetland A is a palustrine, emergent wetland dominated by reed canarygrass (*Phalaris arundinacea*). Scattered bittersweet nightshade (*Solanum dulcamara*) and other hydrophytic species are also present. The presence of these species meets the hydrophytic vegetation criteria. At the time of the wetland delineation, saturation was present within 12" of the surface, which is a primary hydrologic indicator. The typical soil profile observed met the hydric soil criteria for Depleted Matrix.

Because Wetland A is contiguous with Lolo Creek, which has documented habitat for federally listed species such as steelhead and bull trout, it is assumed that the wetland contributes habitat support these fish species (Attachment C). Wetland A also provides moderate levels of production export/food chain support, sediment/shoreline stabilization, and sediment/nutrient/toxicant removal.

Wetland B

Palustrine scrub-shrub broad-leaved deciduous
Category IV
0.03 acre total

Wetland B is a slope wetland located on the left bank and upstream of the OHWM of Lolo Creek (Figure 2). Wetland B extends upslope to the south approximately 20 feet. It is primarily fed by subsurface seeps that discharge into Lolo Creek; there are no indications that Lolo Creek provides substantial hydrologic input to the wetland.

Wetland B is a palustrine, scrub-shrub, broad-leaved deciduous wetland dominated by speckled alder and Pacific ninebark. Dominant emergent species include meadow foxtail (*Alopecurus pratensis*) and field horsetail (*Equisetum arvense*). The presence of these species meets the criteria for hydrophytic vegetation. Soils in the wetland met the hydric soil indicators for Redox Dark Surface. At the time of the wetland delineation, saturation was present at 14". Based on the presence of hydric soils and hydrophytic vegetation, it is likely that saturation is present within 12" during the early part of the growing season; therefore wetland hydrology is assumed for the area. The hydrogeomorphology and landscape position of Wetland B limits its potential to provide wetland functions. Wetland B provides low to moderate levels of general wildlife habitat, production export/food chain export, and groundwater discharge functions.

Wetland C

Palustrine emergent persistent
Category IV
0.02 acre total

Wetland C is a slope wetland located on the left bank and upslope of Tributary 1 (Figure 2). It is primarily fed by subsurface seeps that discharge into Tributary 1.

Wetland B is a palustrine, scrub-shrub, broad-leaved deciduous wetland dominated by Pacific ninebark, field horsetail, lady fern (*Athyrium filix-femina*), and tall bluebells (*Mertensia paniculata*). The presence of these species meets the criteria for hydrophytic vegetation. At the time of the wetland delineation, surface saturation was present; soils were not sampled since surface saturation was readily visible. As with Wetland B, the hydrogeomorphology and landscape position of Wetland C limits its potential to provide wetland functions. Wetland C provides low to moderate levels of general wildlife habitat, production export/food chain export, and groundwater discharge functions.

3.3 Streams

The study area is located in the Lolo Creek Watershed, located in Clearwater River Basin (USGS HUC 17060306). Table 5 summarizes the location, extent and primary characteristics of streams identified in the study area. The stream types described in this report are based on the stream reaches within the study area; downstream reaches may be designated differently.

Lolo Creek

The Lolo Creek watershed is roughly 156,000 acres in size (Clearwater Soil and Water Conservation District *et al*. 1993), with headwaters in the Hemlock Butte area on the Clearwater National Forest (CNF). The lowermost 0.5 mile of Lolo Creek canyon is privately owned. BLM owns most of the canyon corridor between approximately creek mile 0.5 and 7.5. Continuing upstream to the CNF boundary is a combination of private, Idaho Department of Lands (IDL),

Table 5. Summary of Streams in the Study Area.

Stream Name	Tributary to	USACE Jurisdiction	Average Width in Study Area (ft)[a]	Approximate Length in Study Area (ft)[a]	Stream Characteristics in Project Reach	Surface Water Use Designation (IDAPA 58.01.02.100)	Antidegredation Policy Designation (IDAPA 58.01.02.051)	303(d)/ 305(b) Integrated List
Lolo Creek	Clearwater River	RPW[b]	119.3	433.0	• Perennial stream • In 100-year floodplain (Zone A)[c] • Snake River Steelhead DPS: Spawning and emergence; adult/ juvenile migration. Designated Critical Habitat[d] • Bull trout: spawning and emergence; adult/ subadult migration[d]	• Aquatic Life (Cold Water) • Primary or Secondary Contact Recreation[e]	Tier 1 protection[f]	Not Listed (Unassessed/ Category 3)[f]
Tributary 1	Lolo Creek	RPW	5.6	90.6	• Seasonal stream • No documentation of fish occurrence or habitat; no barriers to Lolo Creek	• Aquatic Life (Cold Water) • Primary or Secondary Contact Recreation[e]	Tier 1 protection[f]	Not Listed (no data)[f]

Notes:
[a] Average widths and approximate lengths were determined based on existing survey data and field observations.
[b] RPW = Relatively Permanent Water (continuous seasonal flow [e.g., typically ≥3 months])
[c] FEMA (1991); Zone A indicates no base flood elevations have been determined
[d] HDR (2011)
[e] Lolo Creek and its tributary are undesignated surface waters; however, IDEQ presumes most waters in the state will support cold water aquatic life and primary or secondary contact recreation beneficial uses, thus IDEQ applies cold water aquatic life and primary or secondary contact recreation criteria to undesignated waters under most conditions (IDAPA 58.01.02.101.01). No "Outstanding Resource Waters" occur on BLM lands in Idaho (BLM 2011). BLM has designated Lolo Creek as eligible for listing under the Wild and &Scenic Rivers Act; however, it is not formally designated as a Wild and Scenic River.
[f] IDEQ (2009, 2010)

BLM and CNF lands. Lolo Creek is approximately 42 miles long (Espinosa 1984) flows into the Clearwater River at river mile 54.1. The creek flows in a west/northwesterly direction within a narrow, V-shaped canyon through elevations ranging from about 1,100 to 3,660 ft (Mancuso 1996).

The BLM (Inter-Fluve 1993) conducted a stream habitat study in Lolo Creek, and based on gradient and channel confinement, mapped two distinct channel types within Lolo Creek. A-type channels (Rosgen 1985) comprise most of the lower 14 miles of Lolo Creek, where they are confined by the canyon walls. Gradient is relatively high and sinuosity low. Floodplain is found only in a few limited areas, and riparian vegetation occurs only in narrow strips near the channel.

On the right bank within the study area, riparian vegetation is sparse immediately downstream of the bridge for about 75 feet. Quarry spalls and fill material are present. As one moves downstream, a thin band of immature, multi-branching thinleaf alder comprise the bulk of the riparian community along the bank, which is heavily disturbed. During lower flow periods, extensive gravel bars are exposed along the bank. These gravel bars provide habitat for invasive reed canarygrass during low flow periods. Compared to the left bank, which is well defined, the right bank contains an artificially created floodplain (due to disturbance and fill on the right bank). The OHWM along the right bank is defined as the top of bank just landward of the thin band of alders.

The left bank downstream of the Lolo Creek Bridge is characterized by facultative grasses, shrubs and immature trees (multi-branching alder) atop relatively well-drained alluvial material, including large cobbles and small boulders. Outside of Wetland B, thimbleberry, snowberry and reed canarygrass occur along the bank landward OHWM. The OHWM is defined along the left bank as approximately one foot above the rooting zone of the immature alders that line the bank. During extreme high flow periods, the alders are inundated to the top of bank.

According to NPT gage data collected from the Lolo Creek Bridge from 2005 to 2009, typical peak flows occur from April through June and average about 2,044 cfs; however, extreme flows have reported reached over 6,000 cfs (S. Sprague, NPT, pers. comm., 2011). Typical high flows approach the level of the OHWM. In the general footprint of the proposed weir, instream substrate is dominated by gravels and cobbles of various sizes, but generally larger than 2-inches. Large boulders and several very large bedrock fracture boulders are present in the creek immediately downstream of the bridge. Spring Chinook are not known to spawn in the study area, as the majority of spawning occurs upstream of the USFS boundary, about 10 river miles upstream of the proposed project. Steelhead may spawn in the study area, though no spawning has been observed or documented by NPT staff operating the weir over the past decade (Sprague 2011).

Lolo Creek is the only special emphasis/priority watershed identified for steelhead and bull trout within the Clearwater River subbasin. Federally-listed fall Chinook salmon (Snake River ESU) occur in the mainstem Clearwater River for spawning and rearing; however, they do not occur within the study area in Lolo Creek. Likewise, fall Chinook critical habitat includes the mainstem Clearwater River to the mouth of Lolo Creek. As such, fall Chinook critical habitat is not present in the study area. Spring/summer Chinook salmon occur in the action area but are not ESA-listed in the Clearwater River Basin. The study area of Lolo Creek is used by all

freshwater life history stages of threatened Snake River (SR) Basin steelhead, and Lolo Creek is designated as critical habitat for SR steelhead. The study area is also designated EFH for Chinook and coho salmon. Federally-listed bull trout occur within Lolo Creek, but are rarely observed at the weir location. Lolo Creek was not included in the final designation of critical habitat for bull trout (USFWS 2010). Pacific lamprey, a federal species of concern, are present in Lolo Creek, though spawning and juvenile rearing does not likely occur in the study area due to the cobble/gravel nature of the substrate. BLM sensitive species present in Lolo Creek include spring/summer Chinook, coho, westslope cutthroat trout, redband trout, and Pacific lamprey.

Peak flows in Lolo Creek coincide with snowmelt and typically occur from April through early July. Flows decrease during late July and August, with base flow levels normally reached by September and remaining through February. In 2005, the NPT installed a flow gage on the Lolo Creek Bridge, just upstream of the temporary weir location. The highest annual peak flow on record was 2,803 cfs occurring April 2006. The lowest annual peak flow on record was 9.3 cfs, occurring in September 2006. Table 6 depicts average monthly flows in Lolo Creek as measured at the NPT Lolo Creek Bridge gage located approximately 50 feet upstream of the temporary weir location.

Table 6. Lolo Creek Average Monthly Flows (cfs) as Measured at Lolo Creek Bridge (2005-2009[1]).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Monthly Streamflows	285.3	196.3	465.8	760.6	737.9	380.5	67.7	33.6	24.4	36.2	106.4	232.8

[1] Source: NPT unpublished data

Tributary 1

Tributary 1 is a small (5-8 ft wide), cobble-lined intermittent stream that enters the left bank of Lolo Creek just downstream of the proposed weir location. This tributary appears to collect water from seeps on the adjacent hillside to the left, and runoff from the county road to the east. It is relatively high gradient as one moves upstream from the confluence with Lolo Creek and is dominated by large cobbles and gravels throughout. Sands and small gravels are present near the confluence with Lolo Creek, sands and small gravels. The tributary supports a narrow wetland (Wetland C) on the left bank from the confluence to about 50 feet upstream of the confluence. Due to the relatively high gradient, it is unlikely that juvenile salmonids enter the tributary during low flows; however, lower portions of the tributary at the confluence with Lolo Creek may be used by juvenile salmonids as off-channel rearing habitat/refugia during high flow events.

4.0 Project Effects

4.1 Wetland Impacts

Project impacts to wetlands would be limited to the south portion of Wetland A, which would be designated as a kayak put-in area. Pedestrian access would likely increase in this portion of Wetland A; however, no structures would be constructed for this put-in area, and no fill would be placed in the wetland (Figure 2). No other wetlands would be temporarily or permanently affected by the proposed project.

4.2 Stream Impacts

The following structures would be constructed in the dry behind cofferdams during the in-water work period:

- Picket weir, including concrete sill, low flow notch and bank abutments
- Vertical slot fishway
- Fish trapping and holding area
- Work area (minor portion of is below OHW)

In addition, several very large instream boulders will be removed from the weir footprint. At the request of the NPT, several additional boulders may be repositioned or removed from the project reach downstream of the bridge to facilitate seasonal installation of the screw trap. The boulders would either be manually removed using excavators behind the cofferdams, or removed via fracturing. If fracturing is used, it will occur in the dry behind isolation cofferdams. Fracturing may occur via use of small detonators or by use of techniques such as the "Boulder Buster™". If small detonators are used, a small hole will be drilled into the boulder and a small explosive will be placed into the rock to fracture the boulder into smaller pieces that can be more easily moved from the construction footprint.

The "Boulder Buster" breaks up rocks and boulders without the use of explosives or a certified blaster, but rather via use of a portable machine and cartridges that are transported to the site.

Details regarding each in-water element are described in the Joint Permit Application. Erosion and sediment control measures would be implemented prior to initiation of construction activities. A silt fence would be placed along the top of the bank at the edges of the excavation area and would tie into the cofferdam to minimize sediment transport to the creek. A silt fence would also be placed along the top of bank of the small intermittent channel that enters the creek just downstream of the construction area.

In total, construction of instream elements would result in the removal of about 338 cy of bed and bank materials, and the addition of 350 cy of concrete, picket weir and collection facility materials below the OHWM of Lolo Creek. In-water activities would occur from August 1 through October 31st of the construction year. Construction below the OHWM would occur in the dry behind a cofferdam, and would be conducted according to the provisions of the CWA Section 404 permit and IDWR Stream Channel Alteration permit to be obtained for the project.

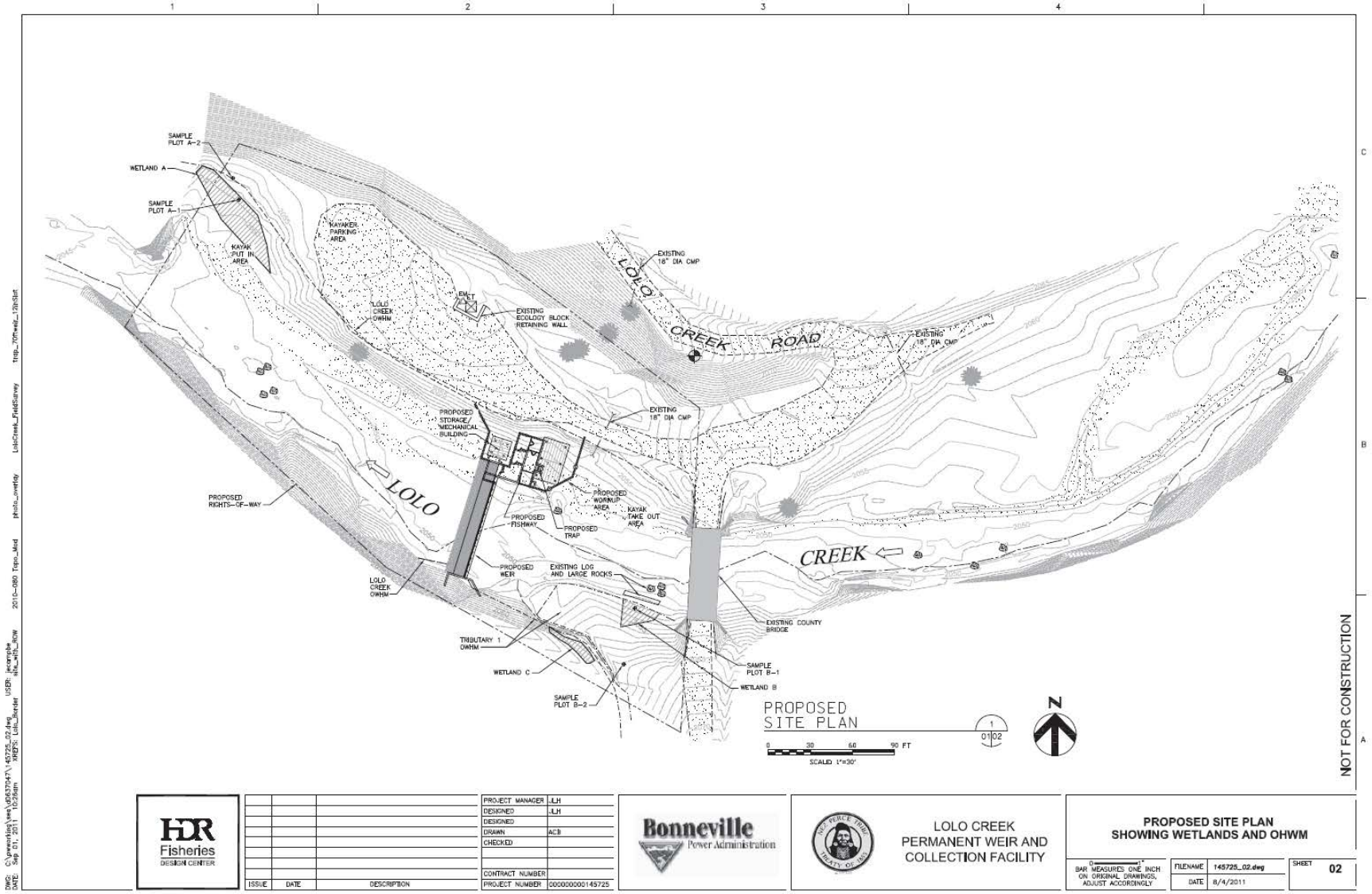

Figure 3. Lolo Creek Permanent Fish Weir, Proposed Site Plan.

The existing facility landing along the right bank and Lolo Creek Road would provide construction access to the river. The left bank is accessible to construction equipment via the Lolo Creek Bridge.

A detailed narrative of the proposed construction methods and minimization measures are described in the Biological Assessment prepared for this project (HDR 2011).

4.3 Riparian Habitat Enhancements

To mitigate for disturbance along the streambank of Lolo Creek, particularly for removal of 2-3 mature conifers on the left bank of Lolo Creek due to construction of left bank weir infrastructure, portions of the right bank riparian corridor will be planted with native saplings and shrubs. Along the right bank, just downstream of the proposed kayak-launch area (at the western-most portion of the site), portions of the bank currently dominated by reed-canary grass below the OHWM will be planted with 3 cedar saplings and several Sitka willow bundles to enhance water quality and aquatic habitat functions. Tree and shrub species have been chosen based upon existing native vegetation that was observed as thriving in existing riparian areas at the project sites.

Table 7. Proposed Planting Palette for Aquatic Area Buffer Enhancement

Common Name	Scientific Name	Size	Typical Spacing (feet on center)
Trees/Shrubs			
Sitka willow	*Salix sitchensis*	slips – up to ½” dia. X 4’ length	1-2
Western redcedar	*Thuja plicata*	2-gal	9

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Attachment A: Wetland Delineation Methodology

Wetlands are defined as areas saturated or inundated by surface or groundwater at a frequency and duration sufficient to support, and which under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. The methods used to delineate the on-site wetlands conform to methods the U.S. Army Corps of Engineers Wetland Delineation Manual (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010).

To be considered a wetland, an area must have hydrophytic vegetation, hydric soils, and wetland hydrology. HDR Engineering, Inc. staff collected data on these parameters in areas representative of typical site conditions. Staff collected additional data in associated uplands as needed to confirm wetland and stream boundaries. Data plot locations in the study area were marked in the field using a Trimble GeoXT 2005 GPS device, which is capable of sub meter accuracy.

Vegetation

The dominant plants and their wetland indicator status were evaluated to determine if the vegetation was hydrophytic. Hydrophytic vegetation is defined as vegetation adapted to wetland conditions. To meet the hydrophytic vegetation criterion, more than 50 percent of the dominant plants in each stratum must be Facultative, Facultative Wetland, or Obligate, based on the wetland indicator category assigned to each plant species by USFWS (Reed 1988, or current approved list). Table A-1 lists the definitions of the indicator categories.

Table A-1. Definitions of Wetland Plant Indicator Categories used to Determine the Presence of Hydrophytic Vegetation

Wetland Indicator Category	Symbol	Definition
Obligate Wetland Plants	OBL	Plants that almost always (> 99% of the time) occur in wetlands, but which may rarely (< 1% of the time) occur in non-wetlands.
Facultative Wetland Plants	FACW	Plants that often (67 to 99% of the time) occur in wetlands, but sometimes (1 to 33% of the time) occur in non-wetlands.
Facultative Plants	FAC	Plants with a similar likelihood (34 to 66% of the time) of occurring in both wetlands and non-wetlands.
Facultative Upland Plants	FACU	Plants that sometimes (1 to 33% of the time) occur in wetlands, but occur more often (67 to 99% of the time) in non-wetlands.
Upland Plants	UPL	Plants that rarely (< 1% of the time) occur in wetlands, and almost always (> 99% of the time) occur in non-wetlands.

Source: Reed (1988).

HDR biologists used *Plants of the Pacific Northwest Coast* (Pojar and MacKinnon 1994), *Plants of Southern Interior British Columbia and the Inland Northwest* (Parish et al. 1996), *Weeds of*

the West (Whitson et al. 1992), and *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973) as field references to assist with plant identification. Scientific and common plant names follow currently accepted nomenclature. Most names are consistent with *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973) and the PLANTS Database (USDA 2004). During the field investigation, staff observed and recorded the dominant plant species on data sheets for each data plot.

Soils

Generally, an area must contain hydric soils to be a wetland. Hydric soil forms when soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part (12 inches). Biological activities in saturated soil result in reduced oxygen concentrations and organisms turn to anaerobic processes for metabolism. Over time, anaerobic biological processes result in certain soil color patterns, which are used as indicators of hydric soil. Typically, low-chroma colors are formed in the soil matrix, and bright-colored redoximorphic features form within the matrix. Other important hydric soil indicators include organic matter accumulations in the surface horizon, reduced sulfur odors, and organic matter staining in the subsurface (USDA NRCS 2010).

HDR Engineering, Inc. staff examined soils by excavating sample pits to a depth of 20 inches to observe soil profiles, colors, and textures. In some case, a shallower soil pit was adequate to document hydric soil indicators. Munsell color charts (Munsell Color 2009) were used to describe soil colors.

Hydrology

HDR Engineering, Inc. staff examined the area for evidence of hydrology. Wetland hydrology criteria were considered to be satisfied if it appeared that the soil was seasonally inundated or saturated to the surface for a consecutive number of days greater than or equal to 12.5 percent of the growing season (USACE 2010). The growing season generally begins when the soil reaches a temperature of 41 degrees Fahrenheit in the zone of root penetration or when certain indicators of plant biological activity are evident (USACE 2010). The growing season in the project area can be approximated using the long-term climatological data reported in WETS tables available from the USDA NRCS (2003) National Water and Climate Center. At Fenn Ranger Station, the growing season is estimated to occur between March 31 and October 30 (213 days).

Wetland hydrology indicators are divided into two categories – primary and secondary indicators (USACE 2010). Primary indicators of hydrology include surface inundation, high water table, and saturated soils. The presence of one primary indicator is sufficient to conclude that wetland hydrology is present. If the absence of a primary indicator, observation of two or more secondary indicators is required to conclude that wetland hydrology is present. Secondary indicators of hydrology include drainage patterns, water-stained leaves, and geomorphic setting (USACE 2010).

Attachment B: Wetland Delineation Data Forms

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

Project/Site: Lolo Creek Nez Perce Tribe Fish Weir City/County: Clearwater & Idaho Counties Sampling Date: 6/22/2011
Applicant/Owner: Bonneville Power Administration/Nez Perce Tribe State: Idaho Sampling Point: A-2 (UPL)
Investigator(s): L. Danielski Section, Township, Range: S17 T34N R4E
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): none Slope (%): ~5%
Subregion (LRR): LRRE Lat: 46.294434 Long: -115.976119 Datum:
Soil Map Unit Name: Johnson-Texascreek complex, 35 to 75 percent slopes NWI Classification: ---
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ___ Soil ___ Or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ___ Soil ___ Or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks: Sample plot is located upslope and east of Wetland A. Area does not meet criteria for wetland indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
5			
	= Total Cover		

Herb Stratum (Plot Size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Artemisia vulgaris*	50	Y	UPL
2 *Rumex acetosella*	10	N	FACU
3 *HYPOCHAERIS RADICATA*	5	N	FACU
4			
5			
6			
7			
8			
9			
10			
11			
	65 = Total Cover		

Woody Vine Stratum (Plot Size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum 35

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL Species		x1 =	
FACW Species		x2 =	
FAC Species		x3 =	
FACU Species	15	x4 =	60
UPL Species	50	x5 =	250
Column Totals:	65 (A)		310 (B)

Prevalence Index = B/A = 4.77

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Test is ≤ 3.0[1]
- ___ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
- ___ Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophitic Vegetation[1] (explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present?

Yes ___ No X

Remarks: Area does not meet criteria for hydrophitic vegetation

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

SOIL

Sampling Point: **A-2 (UPL)**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100	--	--	--	--	sandy loam	
5-20+	10YR 3/2	100	--	--	--	--	gravelly sand	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils[3]:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)(except MLRA1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ 2 cm Muck (A10) (**LRR B**)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inch ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

soils do not meet hydric soil criteria

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of 1 required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) (**except MLRA 1,2,4A, and 4B**)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9 (**MLRA 1,2,4A, and 4B**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No ___	Depth (inches): --
Water Table Present?	Yes ___	No X	Depth (inches): >20"
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >20"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators of wetland hydrology.

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

Project/Site: Lolo Creek Nez Perce Tribe Fish Weir | City/County: Clearwater & Idaho Counties | Sampling Date: 6/22/2011

Applicant/Owner: Bonneville Power Administration/Nez Perce Tribe | State: Idaho | Sampling Point: SP A-1 (WL)

Investigator(s): L. Danielski | Section, Township, Range: S17 T34N R4E

Landform (hillslope, terrace, etc): Floodplain | Local relief (concave, convex, none): concave | Slope (%): 0%

Subregion (LRR): LRRE | Lat: 46.294434 | Long: -115.976119 | Datum:

Soil Map Unit Name: Johnson-Texascreek complex, 35 to 75 percent slopes | NWI Classification: PEM1

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks)

Are Vegetation ___ Soil ___ Or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ Soil ___ Or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes x	No ___	**Is the Sampled Area within a Wetland?** **Yes** x **No** ___
Hydric Soil Present?	Yes x	No ___	
Wetland Hydrology Present?	Yes x	No ___	

Remarks: Sample plot is located in Wetland A, on the right bank of Lolo Creek. Area meets criteria for all three wetland indicators.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
5			
	= Total Cover		

Herb Stratum (Plot Size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Phalaris arundinacea*	75	Y	FACW
2 *Solanum dulcamara*	5	N	FAC
3 *Claytonia sibirica*	3	N	FAC
4 *Plantago lanceolata*	1	N	FAC
5 *Achillea millefolium*	1	N	FACU
6 *Equisetum arvense*	1	N	FAC
7			
8			
9			
10			
11			
	86 = Total Cover		

Woody Vine Stratum (Plot Size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum 14

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL Species		x1 =	
FACW Species	75	x2 =	150
FAC Species	10	x3 =	30
FACU Species	1	x4 =	4
UPL Species		x5 =	
Column Totals:	86 (A)		184 (B)

Prevalence Index = B/A = 2.14

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- X Prevalence Test is ≤ 3.0[1]
- ___ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
- ___ Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophitic Vegetation[1] (explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present?

Yes X **No** ___

Remarks: Area meets dominance test for hydrophytic vegetation

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

SOIL Sampling Point: **SP A-1 (WL)**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100	--	--	--	--	sandy loam	
6-15+	10YR 4/2	95	7.5YR 4/6	5	C	M	gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)(except MLRA1)
- ___ Loamy Gleyed Matrix (F2)
- x Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inch ___

Hydric Soil Present? **Yes** x **No** ___

Remarks:

Soils meet depleted matrix criteria

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of 1 required: check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1,2,4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9 (**MLRA 1,2,4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): --
Water Table Present?	Yes X	No ___	Depth (inches): 14"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 10"

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturation within 12" indicates wetland hydrology. Water table likely within 12" earlier in growing season.

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

Project/Site: Lolo Creek Nez Perce Tribe Fish Weir City/County: Clearwater & Idaho Counties Sampling Date: 6/22/2011
Applicant/Owner: Bonneville Power Administration/Nez Perce Tribe State: Idaho Sampling Point: B-1 (WL)
Investigator(s): L. Danielski Section, Township, Range: S17 T34N R4E
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): concave Slope (%): ~10%
Subregion (LRR): LRRE Lat: 46.294434 Long: -115.976119 Datum:
Soil Map Unit Name: Lochsa sandy loam, 25 to 65 percent slopes NWI Classification: PSS1
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ___ Soil ___ Or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ___ Soil ___ Or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes X No
Hydric Soil Present?	Yes X	No	
Wetland Hydrology Present?	Yes X	No	

Remarks: Area meets criteria for wetland indicators. Sample plot is located in Wetland B (left bank of Lolo Creek)

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Alnus incana*	25	Y	FACW
2 *Physocarpus capitatus*	10	Y	FACW
3			
4			
5			
	35 = Total Cover		

Herb Stratum (Plot Size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Alopecurus pratensis*	50	Y	FACW
2 *Equisetum arvense*	10	N	FAC
3 *Angelica spp.*	5	N	FACW
4 *Geum macrophyllum*	1	N	FACW
5 *Claytonia sibirica*	1	N	FAC
6			
7			
8			
9			
10			
11			
	67 = Total Cover		

Woody Vine Stratum (Plot Size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum 33

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL Species		x1 =	
FACW Species	91	x2 =	182
FAC Species	11	x3 =	33
FACU Species		x4 =	
UPL Species		x5 =	
Column Totals:	102 (A)		215 (B)

Prevalence Index = B/A = 2.11

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- X Prevalence Test is ≤ 3.0[1]
- ___ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
- ___ Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophitic Vegetation[1] (explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present?

Yes X **No** ___

Remarks: Area meets dominance test for hydrophytic vegetation.

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

SOIL Sampling Point: **B-1 (WL)**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/1	95	7.5YR 4/6	5	C	M	fine sandy loam	
7-20+	10YR 3/1	100	--	--	--	--	fine gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils[3]:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)(except MLRA1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- x Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inch ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils meet criteria for redox dark surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of 1 required: check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9) (**except MLRA 1,2,4A, and 4B**)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Stunted or Stressed Plants (D1) (**LRR A**)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9 (**MLRA 1,2,4A, and 4B**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)
- ___ Raised Ant Mounds (D6) (**LRR A**
- ___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): --
Water Table Present?	Yes ___	No X	Depth (inches): >20"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 14"

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturation is likely present within 12" during the early part of the growing season, therfore wetland hydrology is assumed for area. Presence of hydric soils and hydrophytic vegetation also indicates shallower saturation early in the growing season.

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

Project/Site: Lolo Creek Nez Perce Tribe Fish Weir | City/County: Clearwater & Idaho Counties | Sampling Date: 6/22/2011

Applicant/Owner: Bonneville Power Administration/Nez Perce Tribe | State: Idaho | Sampling Point: B-2 (UPL)

Investigator(s): L. Danielski | Section, Township, Range: S17 T34N R4E

Landform (hillslope, terrace, etc): Hillslope | Local relief (concave, convex, none): convex | Slope (%): >10%

Subregion (LRR): LRRE | Lat: 46.294434 | Long: -115.976119 | Datum:

Soil Map Unit Name: Lochsa sandy loam, 25 to 65 percent slopes | NWI Classification: ---

Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks)

Are Vegetation ___ Soil ___ Or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___

Are Vegetation ___ Soil ___ Or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** **Yes** ___ **No** X
Hydric Soil Present?	Yes ___	No x	
Wetland Hydrology Present?	Yes ___	No x	

Remarks: Area does not meet criteria for wetland indicators. Sample plot is located upslope and south of Wetland B.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ___)	Absolute % Cover	Dominant Species?	Indicator Status
1 *Thuja plicata*	10	Y	FAC
2			
3			
4			
	10 = Total Cover		

Sapling/Shrub Stratum (Plot size: ___)			
1 *Rubus parviflorus*	15	Y	FAC
2 *Rhamnus purshiana*	5	Y	FAC
3 *Amelanchier alnifolia*	5	Y	FACU
4 *Acer glabrum*	5	Y	FAC
5 *Crataegus douglasii*	5	Y	FAC
	35 = Total Cover		

Herb Stratum (Plot Size: ___)			
1 *Fragaria virginiana*	30	Y	FACU
2 *Trientalis latifolia*	25	Y	FAC
3 *Hypochaeris radicata*	10	N	FACU
4 *Streptopus amplexifolius*	5	N	FAC
5 *Rumex acetosella*	5	N	FACU
6 *Urtica dioica*	5	N	FAC
7 *Epilobium angustifolium*	5	N	FACU
8 *Galium aparine*	5	N	FACU
9 *Claytonia sibirica*	5	N	FAC
10 *DRYOPTERIS EXPANSA*	5	N	FACW
11			
	100 = Total Cover		

Woody Vine Stratum (Plot Size: ___)			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL Species		x1 =	
FACW Species	5	x2 =	10
FAC Species	80	x3 =	240
FACU Species	60	x4 =	240
UPL Species		x5 =	
Column Totals:	145 (A)		490 (B)

Prevalence Index = B/A = 3.38

Hydrophytic Vegetation Indicators:

- X Dominance Test is >50%
- ___ Prevalence Test is ≤ 3.0[1]
- ___ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
- ___ Wetland Non-Vascular Plants[1]
- ___ Problematic Hydrophitic Vegetation[1] (explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present?

Yes X **No** ___

Remarks: Area meets dominance test for hydrophitic vegetation; however, it does not meet prevalence test

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

SOIL Sampling Point: **B-2 (UPL)**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-24	10YR 3/2.5	100	--	--	--	--	gravelly sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils[3]:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)(except MLRA1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ 2 cm Muck (A10) (**LRR B**)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inch ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soils do not meet criteria for any hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of 1 required: check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) (**except MLRA 1,2,4A, and 4B**)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9 (**MLRA 1,2,4A, and 4B**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): --
Water Table Present?	Yes ___	No X	Depth (inches): >24"
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): >24"

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No primary or secondary indicators of wetland hydrology.

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

Project/Site: Lolo Creek Nez Perce Tribe Fish Weir City/County: Clearwater & Idaho Counties Sampling Date: 6/22/2011
Applicant/Owner: Bonneville Power Administration/Nez Perce Tribe State: Idaho Sampling Point: C-1 (WL)
Investigator(s): L. Danielski Section, Township, Range: S17 T34N R4E
Landform (hillslope, terrace, etc): Hillslope Local relief (concave, convex, none): convex Slope (%): 5-10%
Subregion (LRR): LRRE Lat: 46.294434 Long: -115.976119 Datum:
Soil Map Unit Name: Lochsa sandy loam, 25 to 65 percent slopes NWI Classification: ---
Are climatic/hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks)
Are Vegetation ___ Soil ___ Or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ Soil ___ Or Hydrology ___ Naturally problematic? (If needed, explain any answers in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ___	**Is the Sampled Area within a Wetland?** Yes X No ___
Hydric Soil Present?	Yes X	No ___	
Wetland Hydrology Present?	Yes X	No ___	

Remarks: Area meets criteria for all three wetland indicators. Located in Wetland C.

VEGETATION – Use scientific names of plants.

Tree Stratum Plot size: ___	Absolute % Cover	Dominant Species?	Indicator Status
1			
2			
3			
4			
	= Total Cover		

Sapling/Shrub Stratum Plot size: ___			
1 *Physocarpus capitatus*	50	Y	FACW
2			
3			
4			
5			
	50 = Total Cover		

Herb Stratum Plot Size: ___			
1 *Equisetum arvense*	30	Y	FACW
2 *Athyrium filix-femina*	20	Y	FAC
3 *Viola palustris*	5	N	OBL
4 *Mertensia paniculata*	15	Y	FACW
5			
6			
7			
8			
9			
10			
11			
	70 = Total Cover		

Woody Vine Stratum Plot Size: ___			
1			
2			
	= Total Cover		

% Bare Ground in Herb Stratum 30

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:			Multiply by:
OBL Species	5	x1 =	5
FACW Species	95	x2 =	190
FAC Species	20	x3 =	60
FACU Species		x4 =	
UPL Species		x5 =	
Column Totals:	120 (A)		255 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
X Prevalence Test is ≤ 3.0[1]
___ Morphological Adaptations (Provide supporting data in Remarks or on a separate sheet)
___ Wetland Non-Vascular Plants[1]
___ Problematic Hydrophitic Vegetation[1] (explain)

[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present?

Yes X **No** ___

Remarks: Area meets dominance test for hydrophitic vegetation

WETLAND DETERMINATIONA DATA FORM - Western Mountains, Valleys and Coast Region

SOIL Sampling Point: **C-1 (WL)**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
--	--	--	--	--	--	--	--	--

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils[3]:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
___ Loamy Mucky Mineral (F1)(except MLRA1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ 2 cm Muck (A10) (**LRR B**)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inch ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Soils not formally sampled but assumed hydric based on hydophitic vegetation and evidence of surface saturation

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of 1 required: check all that apply)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Surface Soil Cracks (B6)
___ Inundation Visible on Aerial Imagery (B7)
___ Sparsely Vegetated Concave Surface (B8)
___ Water-Stained Leaves (B9) (**except MLRA 1,2,4A, and 4B**)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres along Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Stunted or Stressed Plants (D1) (**LRR A**)
___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

___ Water-Stained Leaves (B9 (**MLRA 1,2,4A, and 4B**)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Saturation Visible on Aerial Imagery (C9)
___ Geomorphic Position (C9)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)
___ Raised Ant Mounds (D6) (**LRR A**
___ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (inches): --
Water Table Present?	Yes X	No ___	Depth (inches): <6"
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): surface

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface saturation is a primary indicator of wetland hydrology.

Attachment C: Wetland Functional Assessment Forms (MDOT 2008)

(Available Upon Request)

Attachment D: Project Photographs

Refer to Appendix A of EA for photos

Appendix D
Cottonwood Resource Management Plan Conformance

RMP Reference	Citation from 2009 Approved Cottonwood RMP	EA Section
Aquatic Resources, Fish, and Special Status Fish (AF), p. 29 of RMP	**Action AF-1.1.1**—Ensure that all ongoing and new BLM management actions support or do not retard or preclude recovery for federally listed fish (Endangered Species Act), designated critical habitat, and important aquatic habitats (supporting spawning, incubation, larval development, rearing, migration corridors, and aquatic habitats for forage species.	1.1, 1.2, 2.1.1.2, 2.1.3, 3.3, 3.12
Aquatic Resources, Fish, and Special Status Fish (AF), p. 29 of RMP	**Action AF-1.1.2**—Ongoing and new activity or project review will be conducted to assess effects to Essential Fish Habitat (Section 305[b][2] of the Magnuson-Steven Act).	3.3
Aquatic Resources, Fish, and Special Status Fish (AF), p. 29 of RMP	**Action AF-1.1.5**—To promote conservation and restoration for special status fish, where applicable: (1) support conservation easements that protect or conserve special status fish habitat; (2) land acquisitions or exchanges that promote improved management for special status fish; and (3) cooperative planning efforts that promote conservation and restoration for special status fish.	3.3
Aquatic Resources, Fish, and Special Status Fish (AF), p. 29	**Action AF-1.1.6**—Do not undertake management activities that will cause long-term degradation or will retard or preclude restoration and conservation for special status and desired native fish species, and aquatic habitats.	3.3
Aquatic Resources, Fish, and Special Status Fish (AF), p. 29	**Action AF-1.2.1**—Support conservation and restoration measures that: (1) support genetic integrity of special status fish; (2) reduce adverse competition between special status fish and nonnative species; and (3) documentation of genetic identification that supports fisheries management.	3.3
Aquatic Resources, Fish, and Special Status Fish (AF), p. 29	**Action AF-1.3.2**—For each new project, compile, develop, and implement appropriate species and/or habitat-specific BMPs to avoid or minimize adverse impacts on aquatic and riparian habitats. Compile and develop Cottonwood Field Office programmatic-level activity BMPs that may be used as needed for ongoing projects or for new project development to avoid or minimize potential for adverse effects.	2.1.3, 3.3
Areas of Environmental Concern and Research Natural Areas (AR), p. 50	**Action AR-1.8.3**—Protect and enhance segments of the Nez Perce (Nee-Me-Poo) National Historic Trail and the Lewis and Clark National Historic Trail. Cooperate with partners in the management of these trails.	1.1, 1.2, 2.1.3, 3.1, 3.10
Cultural Resources (CR), p. 35-36	**Action CR-1.1.2**—Consult with Native American tribes to identify traditional cultural properties.	2.1, 2.1.3, 3.10
Cultural Resources (CR), p. 35-36	**Action CR-2.1.1**—Identify and evaluate sites and/or traditional cultural properties to determine potential effects.	2.1, 2.1.3, 3.10
Cultural Resources (CR), p. 35-36	**Action CR-2.1.3**—Complete government-to-government consultation with Native American tribes.	2.1, 2.1.3, 3.10
Cultural Resources (CR), p. 35-36	**Action CR-2.1.4**—Minimize effects to site integrity by project redesign, cancellation, or mitigation when significant cultural resources are identified from inventories or consultation.	2.1, 2.1.3, 3.10

Appendix D
Cottonwood Resource Management Plan Conformance

RMP Reference	Citation from 2009 Approved Cottonwood RMP	EA Section
Lands and Realty (LR), p. 49	**Action LR-1.2.3**—[To meet RMP objective LR-1.2, Consider all requests for Rights-of-Way] Areas where realty authorizations should be avoided, or where specific requirements and special mitigation measures must be met, include ACECS, Research Natural Areas, wild and scenic rivers (either designated or proposed), SRMAs, administrative sites, and areas with special or sensitive resource values.	1.1, 1.2, 2.2
National Trails (NT), p. 54	**Action NT-1.1.3**—Develop information and interpretive materials for public distribution.	1.1, 1.2, 2.2, 3.1, 3.7
Native American Tribal Uses- Social and Economic (NA), p. 56	**Action NA-1.1.1**—Consult with Native American tribes to identify culturally significant plants, animals, fish, and important habitats.	1.1, 1.2, 2.1, 3.1.2, 3.10
Native American Tribal Uses- Social and Economic (NA), p. 56	**Action NA-1.1.2**—Consult with Native American tribes and allow collection of resources consistent with other resource goals/objectives.	1.1, 1.2, 2.2, 3.1, 3.10
Native American Tribal Uses- Social and Economic (NA), p. 56	**Action NA-1.1.3**—Incorporate important habitat information into monitoring protocols to assess habitat conditions.	1.1, 1.2, 2.2, 3.1, 3.10
Recreation (RC), p. 42	**Action RC-1.2.4**—Designate Lolo Creek as an SRMA (5,126 acres) and develop an activity plan for this area by 2012. Manage Lolo Creek SRMA as an undeveloped recreation-tourism market for residents and visitors. Recreation Niche: Manage this area to provide backcountry, dispersed, nonmotorized recreation opportunities in an undeveloped setting with an emphasis on whitewater boating and fishing.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.7
Recreation (RC), p. 42	**Action RC-1.2.4.1**—Designate Lolo Creek as zoned for no commercial water-based recreation activities within the SRMA.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.7
Recreation (RC), p. 42	**Action RC-1.2.4.2**—Designate Lolo Creek as zoned for no competitive use within the SRMA.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.7
Recreation (RC), p. 42	**Action RC-1.2.4.3**—Establish parameters for organized group use in the SRMA Activity Plan.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.7
Special Status Plants (SP), p. 31	**Action SP-1.1.3**—Implement appropriate conservation and restoration actions for any new listed, proposed, or candidate species documented as occurring on BLM lands to support delisting. Monitor trends for listed, proposed, and candidate plant populations and change management if applicable (i.e., adaptive management), when desired conditions or trends are not being achieved.	2.1.3, 3.1, 3.6
Special Status Plants (SP), p. 31	**Action SP-1.1.5**—Review ongoing discretionary activities for impacts on listed plants or their habitats. Modify activities where necessary to avoid or minimize adverse impacts on listed plants.	2.1.3, 3.1, 3.5
Special Status Plants (SP), p. 31	**Action SP-1.1.6**—Complete project specific inventories before authorizing discretionary new actions. Review and modify projects and activities to avoid or minimize adverse impacts on listed plants.	2.1.3, 3.1, 3.5
Social and Economic Conditions (SE), p. 56	**Action SE-1.2.2**—Create public and private partnerships to achieve shared economic objectives of providing employment	2.2, 3.1

Appendix D
Cottonwood Resource Management Plan Conformance

RMP Reference	Citation from 2009 Approved Cottonwood RMP	EA Section
	and income to local communities while benefiting ecosystem health.	
Transportation and Travel Management (TM), p. 44	**Action TM-1.4.6**—Implement Road Management Guidelines for road planning, design, and maintenance	2.2, 2.1.3, 3.1, 3.8
Vegetation- Weeds (VW), p. 22	**Action VW-1.1.4**—Implement prevention activities (Appendix A, Best Management Practices for Weed Prevention) as part of field activities to avoid contributing to spread of invasive plants from BLM actions.	2.2, 2.1.3, 3.1, 3.5
Vegetation- Riparian and Wetlands (VR), p. 23	**Action VR-1.1.1**—Improvement of riparian condition may be accomplished in a variety of ways, examples include: (1) riparian restoration (e.g., plantings, seedings, recontouring, placement of topsoil, control of undesirable vegetation); (2) modifying lands uses that further degrade riparian conditions (e.g., livestock grazing; vehicle use, recreation use); and (3) implementation of Aquatic and Riparian Management Strategy	2.2, 2.1.3, 3.1, 3.5
Visual Resources (VR), p. 36	**Action VR-1.1.1**—Manage the following acreage of BLM land according to VRM class designations (Wilderness Study Areas will be managed as VRM Class I): Class I—11,710 acres; Class II—39,012 acres; Class III—59,521 acres; and Class IV—20,236 acres. VRM guidelines are general and are not intended to be site specific. During project planning, more precise mapping and evaluation of VRM class can be done. Mitigation measures will then be identified to reduce visual contrasts, and rehabilitation	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.9
Water Resources (WA), p. 21	**Action WA-1.1.1**—Implement all applicable BMPs to limit nonpoint source pollution and minimize degradation of water quality.	1.1, 1.2, 2.1, 3.1, 3.2.1
Water Resources (WA), p. 22	**Action WA-1.5.1**—No actions will be permitted that will cause definable adverse impacts on the natural and beneficial functions of flood-prone areas.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.4
Water Resources (WA), p. 22	**Action WA-1.5.2**—Identify opportunities for restoration of impaired flood-prone areas, including removal of hazardous materials and nonessential structures that adversely impact function of flood-prone areas.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.4
Wildlife and Special Status Wildlife (WS), p. 25	**Action WS-1.1.2**—Before authorizing new federal actions within areas providing suitable habitat for federally listed, proposed, and candidate species, determine if direct, indirect or cumulative adverse impacts on the species potentially could occur as a result of BLM discretionary actions. If needed, modify the activity to avoid or minimize adverse impacts on the species and suitable habitats.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.3
Wildlife and Special Status Wildlife (WS), p. 25	**Action WS-1.5.3**—For each new project, compile, develop and implement appropriate species and/or habitat-specific BMPs to avoid or minimize adverse impacts on sensitive species and their habitats. Compile and develop CFO programmatic-level activity BMPs for sensitive species that may be used as needed for ongoing projects or for new project development.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.3
Wildlife and Special Status Wildlife (WS), p. 25	**Action WS-1.5.4**—Manage wildlife habitats using established BMPs and guides for BLM sensitive species. Use a species habitat approach (e.g., riparian, old growth, canyon grasslands, etc.) for identification of desired conditions, conducting analysis, and	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.3

Appendix D
Cottonwood Resource Management Plan Conformance

RMP Reference	Citation from 2009 Approved Cottonwood RMP	EA Section
	developing project and activity design measures. Development of project design measures should include conservation and restoration measures for BLM sensitive species, while striving for appropriate habitat diversity and achievement of project objectives.	
Wild and Scenic Rivers (WR), p. 54	**Action WR-1.2.2**—Do not recommend the preliminarily suitable 27.19-mile Lolo Creek segment for congressional designation in the National Wild and Scenic River System (NWSRS). Coordinate management and designation with the Idaho Department of Water Resources and Forest Service… in accordance with the Memorandum of Understanding with the BLM, Forest Service and State of Idaho (State of Idaho 1991). In the interim, the BLM will coordinate management of the segment with the Idaho Department of Water Resources and protective management will be provided on BLM-administered lands in accordance with the following guidelines: • Approve no actions altering the free-flowing nature of the suitable segment through impoundments, diversions, channeling, or installing riprap. • Approve no actions that will measurable diminish the stream segment's identified Outstandingly Remarkable Value(s). • Approve no actions that will modify the setting or level of development of the suitable river segment to a degree that will change its identified Scenic classification.	1.1, 1.2, 2.2, 2.1.3, 3.1, 3.7

References for Appendix D:

State of Idaho. 1991. Memorandum of Understanding Between State of Idaho, Regional Foresters (Northern and Intermountain Regions Forest Service), and State of Idaho Bureau of Land Management. MOU ID-273.