

RECLAMATION

Managing Water in the West

**Finding of No Significant Impact
Final Environmental Assessment
Preston Reach Habitat Complexity Project – Phase 1
Entiat River Sub-Basin,
Columbia Snake River Salmon Recovery Program,
Chelan County, Washington**



U. S. Department of the Interior
Bureau of Reclamation
Pacific Northwest Region
Middle Snake River Field Office
Boise, Idaho

July 2010

U. S. DEPARTMENT OF THE INTERIOR

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian tribes and our commitments to island communities.

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The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Bureau of Reclamation
Middle Snake River Field Office**

PN FONSI 10-08

Introduction

The Bureau of Reclamation (Reclamation) prepared this Finding of No Significant Impact (FONSI) to comply with the Council on Environmental Quality's regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA). This document briefly describes the proposed action, the alternatives considered, the scoping process, Reclamation's consultation and coordination activities, and Reclamation's finding. The Final Environmental Assessment (EA) fully documents the analyses.

Background

The Entiat subbasin is located entirely in Chelan County, Washington. The Entiat River flows approximately 53 miles from its headwaters to where it enters into the Columbia River at river mile (RM) 482.7. The project lies in the Tyee Mountain, Washington U. S. Geological Survey quadrangle (1981) in Sections 2, 3, 10, and 11, Township 27 North, Range 19 East, Willamette Meridian, Chelan County, Washington.

Working in conjunction with the Entiat Habitat Subcommittee (HSC), Reclamation has outlined a methodology for investigation and rehabilitation in the Entiat River. The process entails completion of a Tributary Assessment (TA) followed by a specific Reach Assessment (RA). Reclamation produced the Entiat River TA in January 2009. The TA used existing data as well as collected new data for fisheries, geomorphology, hydrology, sediment, and watershed conditions to evaluate habitat potential in the Entiat from RM 0 to RM 26.0. The TA divided the river into three distinct segments based upon plan form and geologic controls to include RM 0 to RM 16.1, RM 16.1 to RM 21.1, and RM 21.1 to RM 26.0. The TA further subdivided the three river segments into distinct reaches based upon their unique geomorphic character. Each reach was then evaluated in terms of its fishery habitat and opportunities for enhancement.

Following the TA, the Preston RA was finalized in July of 2009 and within the reach an Alternatives Evaluation Report was produced (January 2009), which lead to specific projects for design and implementation within the reach.

The Preston Reach, which extends approximately 2.1 miles along the river, was identified as one of the highest priority reaches for salmon recovery and fish habitat in the TA. The Preston Reach is characterized as an unconfined geomorphic reach type based on natural channel constraints. The Entiat River, in its natural state, historically maintained dynamic equilibrium by actively migrating laterally across its floodplain within the Preston Reach. The flat slopes and complex network of channels that result in a high degree of interaction between the active channel and its floodplain are typical of this unconfined geomorphic reach. The lateral channel migration maintains a lower energy and flatter channel gradient as sediment is stored before being eroded and transported downstream. The natural ecosystem processes of hydrologic, geomorphic, and vegetative regimes create a healthy stream characterized by a dynamic cycle of conversion from river to floodplain and vice versa, producing a continuous renewal of fish habitat. When interaction between these regimes is altered, it can negatively impact the availability of fish habitat and could threaten the continuation of the species within the basin. The Preston RA has identified four sub-reaches within the Preston Reach that have major anthropogenic alterations. Alterations include the construction of levees with rip-rap protection at two sites, placement of stream bank protection and clearing of vegetation with subsequent severe erosion at another site, and the placement of fill in the channel migration zone at a final site.

Multiple actions are necessary for rehabilitation and enhancement within the project reach between RM 21.10 and RM 23.1 or Reach 3A, which is located within the Entiat River floodplain, and includes native-dominated upland and wetland forest, one pond behind the Lower Preston Levee, pastures, and residences. The multiple actions being considered for this reach include possible levee removal, large wood placement, bank stabilization, rip-rap removal, livestock exclusion, and riparian plantings. However, not all the actions will immediately be agreed to by all landowners or funded for in one construction phase (Reclamation 2009a). Therefore, although Reach 3A will be evaluated as a whole system that will function in equilibrium, this EA will primarily be discussing a specific project within Reach 3A. The action area (Phase 1 or the Yurt site) is located between RM 21.4 and RM 21.5, which includes an eroded, 645 linear foot left bank within Preston Reach Inner Zone-4 (PR-IZ-4) (Figure 15 from RA) (Reclamation 2009b). The PR-IZ-4/Yurt site is located between RM 21.10 and RM 21.80 and covers about 12.93 acres of active channel, and contains about 0.30 acres of off-channel habitat (i.e., side channel).

Purpose and Need

The purpose of the proposed action is to provide improved habitat complexity (quantity and quality) for native endangered fish species including spring Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*) and to partially meet the 2008 Biological Opinion for the Federal Columbia River Power System requirements for restoring fish passage and adding habitat complexity to the Entiat River (NOAA Fisheries 2008). The need for the action is to prevent further degradation of fish habitat within the

Entiat River Preston Reach at the Yurt Site location. The left bank (RM 21.40 to RM 21.45) is eroding due to the lack of riparian vegetation that would stabilize the bank. This erosion appears to be providing elevated levels of fine sediment to spawning gravel downstream (RM 21.4).

Alternatives Considered

The EA addressed six alternatives: Alternative A – No Action – Relocate Existing Yurt; Alternative B – Riparian Plantings including Wet Bench; Alternative C – Install Large Woody Debris (LWD) (Discontinuous Bank Treatment); Alternative D – Install LWD and Regrade Bank to Install Bench Planting; Alternative E – Install LWD, Rebuild Existing Bank using Bar Materials, and Install Bench Planting; and Alternative F – Install LWD, Remove Point Bar, and Install Bench Planting. For all alternatives, the only existing infrastructure is a yurt, which in all alternatives will be relocated to the east, away from the bank. NEPA regulations require the action agency to consider a No Action alternative for comparative analysis purposes.

Alternative A – No Action or Relocate Existing Yurt

The No Action Alternative represents a continuation of the current conditions which would leave the river channel and its banks to meander and erode naturally over time. No infrastructure besides an existing yurt located approximately 100 feet from the exiting left bank-line, is at risk on-site. For this alternative, the yurt would be relocated away from the river bank, outside of the wetland and woody riparian vegetation bench areas.

Alternative B – Riparian Planting including Wet Bench

Alternative B would propose establishing riparian vegetation alone, on the lower wetland bench and upper riparian woody vegetation bench to provide some stabilization, shade and cover, and in the long term possibly providing woody to the system. The yurt would be relocated outside the upper riparian planting area.

Alternative C – Install LWD (Discontinuous Bank Treatment)

Under Alternative C, the installation of LWD structures (Discontinuous Bank Treatment) into the existing bank will provide the needed complexity for the Entiat River within the project area and have the potential to recruit new wood.

Alternative D – Install LWD, Regrade Bank to Install Bench Planting (Preferred Alternative)

Alternative D or the Preferred Alternative, installation of LWD structures and riparian planting in the existing bank would increase the habitat complexity to a greater degree than each Alternative B and C alone. This alternative would provide the immediate structural stability provided by the bank and longitudinal LWD structures with the long-term-stability from the plantings. Alternative D offers a greater long-term likelihood of success by establishing the planting zones behind the proposed LWD structures. The LWD structures would provide the short-term stability to allow the plantings to mature, while providing the increased habitat attributes in the reach.

Alternative E – Install LWD, Rebuild Existing Bank using Bar Materials and Install Bench Plantings

This alternative would propose to reconstruct the left bank using materials excavated from the right bank gravel bar and creating a temporary side channel. This is the only alternative that proposes to rebuild the bank outward into the channel (using material from the excavated side channel). The primary purpose of the side channel within this alternative is for diversion of the channel during construction and to provide material for the bank reconstruction. The excavation of a side channel will temporarily redirect some of the current streamflow velocity and sheer stress away from the left bank. In addition, activities in Alternative D will be applied.

Alternative F – Install LWD, Remove Point Bar and Install Bench Plantings

The excavation of the point bar on the right bank would increase hydraulic efficiency and reduce erosive forces on the left bank. Excavation of approximately 1600 cubic yards up to 2.5 feet deep would be removed from the point bar to allow the thalweg or main flow to shift more to the right bank. However, similar to the Alternative E (the excavated side channel), the point bar section that is removed would also be temporary, as material will eventually fill in and reform the right bank. In addition, activities in Alternative D will be applied.

Environmental Consequences

The EA discusses the affected environment and environmental consequences (Chapter 3) of the six alternatives (Chapter 2) on eleven resource areas. These include; land use, geology and soils, water quality, wetlands, vegetation, fish and wildlife, threatened and endangered species, cultural resources, Indian sacred sites, Indian trust assets, and socioeconomics.

Land Use

Under the preferred alternative, land uses would not be affected and the landowner may continue to use the recreational yurt site, following relocation.

Geology and Soils

The preferred alternative would cause only minimal short-term impacts to geological and soil resources, terracing and LWD structures would maximize protection to the main channel. Riparian planting in between the structures in the wetland bench and riparian bench would increase the potential for stabilization and reduce erosion and sediment contributions, which would be temporary and be curbed via silt fences and other best management practices (BMPs).

Water Quality

During implementation of the preferred alternative, periods of sediment discharge resulting in increases of turbidity increases are expected to be short-term in duration, with the bulk of the disturbance occurring during initial placement of material on the river bottom. Temporary increases in

fine sediments and turbidity could affect or cover suitable downstream spawning gravel. Increases in turbidity are anticipated to be similar to those that occur naturally in the river during spring freshets. Spawning, migration, and rearing activity by anadromous fish species has been documented within the project action area; however, the project will not introduce any significant quantities of fine sediments to the system that may affect spawning areas, further increase substrate embeddedness, or degrade existing channel conditions. The project will incorporate BMPs to avoid or minimize sediment inputs to the river during construction, as well as minimize potential increases in turbidity associated with in-water activities.

Wetlands

Due to the lack of a wetland within the activity area, little or no impact to the existing wetlands and wetland functions would occur and conditions would continue in their current state.

Vegetation

Under the preferred alternative, relatively moderate amount of existing riparian vegetation will be removed as part of the project; however, to the extent practicable, every effort will be made to preserve larger well-established riparian vegetation.

All riparian areas where vegetation is removed will be replanted post-construction. The temporal loss of riparian vegetation is expected to have a negligible impact to the aquatic environment. The vegetation to be removed does not afford shade to the river, although it does afford organic input and minimal streambank stability. The preferred alternatives will replace much of this with riparian vegetation that provides shade and an insulating canopy that moderates water temperatures in both summer and winter.

Fish and Wildlife

During construction of the preferred alternative, the main channel bank would be temporarily disturbed and have temporary effects on aquatic and semi-aquatic species distribution and habitat, in terms of sediment and turbidity. During construction, the bank disturbance would have some impacts to fish via increased temporary sediment and water turbidity. Some temporary loss to existing terrestrial and semi-aquatic species habitat would occur, but over time these areas should be reestablished.

Threatened and Endangered Species

This project is recommended under the 2008 Federal Columbia River Power System Biological Opinion (NOAA Fisheries 2008) which provides scientific information to Federal, Tribal, State, and local partners for identifying, prioritizing, and implementing sustainable field projects that improve survival and lead to the recovery of salmon and steelhead listed under the ESA. In response to the Corps 2008 Fish Passage and Restoration Programmatic, NOAA Fisheries considers this project to be Likely to Adversely Affect Upper Columbia River (UCR) steelhead and UCR spring-run Chinook salmon with an associated extent of take of the handling of up to 35 juveniles of each species associated with the incremental isolation (eight increments) of a total of approximately 28,000 square feet of the bed of the Entiat River. NOAA Fisheries does not expect take in the form of turbidity because it anticipates that a portadam will be installed and removed in such a manner as to cause only minor, short term turbidity plumes and because in-water work will not continue if UCR spring-run Chinook salmon redds are located near enough to the action that they are likely to be affected by a turbidity plume (Corps 2008; NOAA Fisheries 2008; Reclamation 2009b).

USFWS agreed this work May Affect and is Not Likely to Adversely Affect bull trout (*Salvelinus confluentus*), and that this project will not destroy nor adversely modify proposed critical habitat for the bull trout. To avoid adverse effects, USFWS recommended that in-water work after September 15th be constrained to the period that begins an hour after sunrise and ends an hour before sunset. This measure would allow bull trout to have the entire twilight and nighttime periods for undisturbed migration and will also provide an opportunity for sediment pulses generated by construction to settle and dissipate before nighttime movements of bull trout begin (USFWS 2010).

Cultural Resources, Indian Sacred Sites, and Indian Trust Assets

Although no known archeological sites have been recorded within 1 mile of the survey area and no cultural resources were identified during the survey, there is currently a no effect designation (Appendix A) for the preferred alternative. Should any cultural resources be discovered, all activities would cease and a Cultural Resource Specialist would be contacted to confirm and/or allow further actions. Under the preferred alternative, there would be no impacts on ITAs since no known ITAs have been identified in the project area.

Socioeconomics

The preferred alternative would not cause disproportionately adverse social, economic, or human health impacts to local minority or low-income populations. Census data indicates that there are few, if any, minority populations in or near the project area. Construction of the proposed action would not result in any significant and adverse impacts on any minority or low-income populations.

Environmental Commitments

The EA identifies BMPs and environmental commitments to minimize potential effects to cultural resources, Indian trust assets, and environmental resources including; geology/soils, vegetation, and fish and wildlife. Reclamation is committed to their implementation using BMPs and considers them to be a part of the Federal action.

Agency Consultation and Coordination

National Historic Preservation Act of 1966

Section 106 of the National Historic Preservation Act, as amended, requires that Federal agencies identify historic properties that may be affected by their actions, and take into account the effects the actions may have on historic properties. Implementing regulations (36 CR Part 800) requires Federal agencies to make determinations in consultation with the State Historic Preservation Office (SHPO) and Indian tribes with a traditional religious or cultural interest in the study area. Reclamation or their contractor completed notifications and consultations as discussed in Section 3.8.1. No responses were received from the Yakama Nation. The Colville Confederated Tribes provided input and assistance with preparation of the contractor's environmental context statement. Although they indicated that the area was used by Indian peoples in the past, they provided no information about specific resources within or near the area of potential effect/study area. The SHPO concurred with the proposed area of potential effect (presented by Reclamation's contractor as the study area) and later concurred with Reclamation's assessment that the proposed action would have "no effect on historic properties" (Appendix C).

Endangered Species Act (1973) Section 7 Consultation

The Endangered Species Act (ESA) requires all Federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. The evaluation of endangered species contained in this EA serves as Reclamation's biological assessment as required under the ESA. It evaluates impacts on listed and candidate species, including the Gray Wolf (*Canis lupus*) – Endangered, Grizzly Bear (*Ursus arctus horribillus*) – Threatened, Canada lynx (*Lynx Canadensis*) – Threatened, Northern Spotted Owl (*Strix occidentalis*) – Threatened, *Hackelia venusta* (showy stickseed) – Endangered, *Spiranthes diluvialis* (Ute ladies' -tresses) – Threatened. The U.S. Fish and Wildlife Service (USFWS) does not expect effects from this project to these listed species and their habitats to occur (See Appendix C in the Final EA).

There are three ESA-listed anadromous fish known to occur within the study area; and the USFWS concurred with the Cascadia Conservation District (CCD) on the findings that the UCR Spring-run Chinook (*Oncorhynchus tshawytscha*) and the UCR Steelhead (*Oncorhynchus mykiss*) would all have a May Affect but Not Likely to Adversely Affect determination. USFWS also agreed that the Bull Trout (*Salvalinus confluentus*) would have a Likely to Adversely Affect determination, therefore USFWS has prescribed in-water work after September 15 be constrained to the period that begins an hour after sunrise and ends an hour before sunset. This measure would allow bull trout to have the entire twilight and nighttime periods for undisturbed migration and would also provide an opportunity for sediment pulses generated by construction to settle and dissipate before nighttime movements of bull trout begin. USFWS agreed the project will not destroy or adversely modify proposed critical habitat for the bull trout (See Response letter Appendix C).

Tribal Coordination and Consultation

Reclamation or their contractor completed notifications and consultations with the Colville Confederated Tribes and the Yakama Indian Nation, as discussed in Section 3.8.1. No responses were received from the Yakama Indian Nation. The Colville Confederated Tribes provided input and assistance with preparation of the contractor's environmental context statement.

Public Involvement

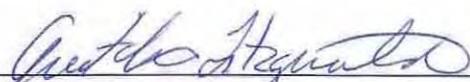
The identification, prioritization, and design of the Preston Reach Yurt Site Riparian Restoration Project have been accomplished within the framework of the Implementation Plan as administered by the Entiat Watershed Planning Unit (EWPU). A critical component to this EWPU planning process is public involvement. The participants in the EWPU are made up of a diverse group of stakeholders representing a wide range of interests including local governments and districts, citizens, tribes, State and Federal agencies, irrigation, agriculture, forestry, community groups, conservation groups, economic development, and recreation. Development of the plan was done through a voluntary, collaborative process supported through the 1998 Watershed Management Act (RCW 90.82) which provided the framework and funding for locally-based planning of water resource related issues (the EWPU).

The Entiat HSC oversees the Implementation Plan as part of the EWPU and has been active in identifying priority actions to protect and enhance habitat of threatened and endangered species throughout the watershed, improving overall habitat function and connectivity. As an extension of the HSC, an Interdisciplinary Team has been developed to analyze project alternatives and guide the project through completion. Since the yurt site project was selected for an alternatives analysis by the HSC, CCD has conducted landowner outreach to affected and adjacent landowners in the project reach. This effort has included letters sent by CCD to all landowners, site visits, meetings, and additional phone and email correspondence to the landowners and other agencies requiring involvement (Appendix B).

Finding

Based on a thorough review of the comments received and analysis of the environmental impacts, best management practices, and implementation of all environmental commitments as presented in the Final EA and this FONSI, Reclamation has concluded that the Preferred Alternative will have no significant effect on the human environment. Reclamation, therefore, concludes that preparation of an Environmental Impact Statement is not required, and that this FONSI satisfies the requirements of NEPA.

Recommended:

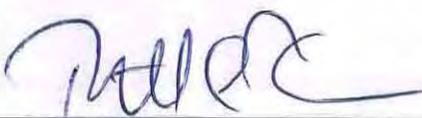


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7/29/10

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Approved:



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Regional Director
Boise, Idaho

Acting For

7-30-10

Date

Acronyms and Abbreviations

AER	Alternatives Evaluation Report
APE	Area of Potential Effects
BFE	Base Flood Evaluation
BIA	U. S. Bureau of Indian Affairs
BMPs	Best Management Practices
BPA	Bonneville Power Administration
CCD	Cascadia Conservation District
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
Corps	U. S. Army Corps of Engineers
CWA	Clean Water Act
DAHP	Department of Archaeology and Historic Preservation
DPS	Distinct Population Segments
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESUs	Evolutionarily significant units
EWPU	Entiat Watershed Planning Unit (or Implementation Plan)
FCRPS	Federal Columbia River Power System
FONSI	Finding of No Significant Impact

HSC	Habitat Subcommittee
IDT	Interdisciplinary Team
IRUs	Interim Recovery Units
IZ	Inner Zone
ITAs	Indian Trust Assets
ITS	Index of Thermal Stress
LWD	Large Woody Debris or Structures
MHI	median household income
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOAA Fisheries Service	National Marine Fisheries Service
NOI	Notice of Intent
NPS	National Park Service
OZ	Outer Zone
PBA	Programmatic Biological Assessment
RA	Reach Assessment
Reclamation	U.S. Bureau of Reclamation
RM	River Mile
RTT	Upper Columbia Regional Technical Team
SHPO	State Historic Preservation Office
TA	Tributary Assessment
TCPs	Traditional cultural properties
TMDL	Total Maximum Daily Load

USFS	U. S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Service
VS	Valley Segments
WQI	Water Quality Index
WDFW	Washington Department of Fish and Wildlife
WDL	Washington Department of Lands
WDOE	Washington Department of Ecology
yd ³	cubic yards

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TABLE OF CONTENTS

Acronyms and Abbreviations

Table of Contents	i
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Chapter 1 Introduction 1

1.1	Location and Background	1
1.2	Purpose and Need for the Action	6
1.3	Scoping.....	8
1.4	Authority	8
1.5	Regulatory Compliance.....	9
1.5.1	National Environmental Policy Act.....	9
1.5.2	Endangered Species Act	9
1.5.3	National Historic Preservation Act.....	9
1.5.4	Executive Order 13007: Indian Sacred Sites	10
1.5.5	Executive Order 12898: Environmental Justice	10
1.5.6	Secretarial Order 3175: Department Responsibilities for Indian Trust Assets.....	10
1.6	Related Actions and Activities.....	10

Chapter 2 Alternatives 11

2.1	Introduction.....	11
2.2	Similarities Among Alternatives.....	12
2.3	Alternative A – No Action - Relocate Existing Yurt	12
2.4	Alternative B – Riparian Planting Including Wet Bench.....	12
2.5	Alternative C – Install LWD (Discontinuous Bank Treatment)	13
2.6	Alternative D - Install LWD, Regrade Bank to Install Bench Planting (Preferred Alternative)	13
2.7	Alternative E – Install LWD, Rebuild Existing Bank using Bar Materials and Install Bench Plantings.....	14
2.8	Alternative F – Install LWD, Remove Point Bar and Install Bench Plantings.....	14
2.9	Construction	15
2.9.1	Construction Sequencing	15
2.9.2	Site Preparation.....	15
2.9.3	Staging and Site Access	16

Chapter 3 Affected Environment and Environmental Consequences 17

3.1	Land Use	17
-----	----------------	----

TABLE OF CONTENTS (continued)

3.1.1	Affected Environment.....	17
3.1.2	Environmental Consequences.....	18
3.2	Geology and Soils	18
3.2.1	Affected Environment.....	18
3.2.2	Environmental Consequences.....	19
3.3	Water Quality	21
3.3.1	Affected Environment.....	21
3.3.2	Environmental Consequences.....	22
3.4	Wetlands.....	26
3.4.1	Affected Environment.....	26
3.4.2	Environmental Consequences.....	26
3.5	Vegetation	27
3.5.1	Affected Environment.....	27
3.5.2	Environmental Consequences.....	27
3.6	Fish and Wildlife.....	29
3.6.1	Affected Environment.....	29
3.6.2	Environmental Consequences.....	33
3.7	Threatened and Endangered Species.....	34
3.7.1	Affected Environment.....	34
3.7.2	Environmental Consequences.....	38
3.8	Cultural Resources and Sacred Sites.....	39
3.8.1	Affected Environment.....	39
3.8.2	Environmental Consequences.....	41
3.9	Indian Sacred Sites	41
3.9.1	Affected Environment.....	41
3.9.2	Environmental Consequences.....	41
3.10	Indian Trust Assets.....	42
3.10.1	Affected Environment.....	42
3.10.2	Environmental Consequences.....	42
3.11	Socioeconomics.....	43
3.11.1	Affected Environment.....	43
3.11.2	Environmental Consequences.....	44
3.12	Environmental Commitments	44
3.13	Cumulative Effects.....	47
Chapter 4	Consultation and Coordination.....	49

TABLE OF CONTENTS (continued)

4.1	Consulting Agencies and Public Involvement	49
4.2	National Historic Preservation Act of 1966	50
4.3	Endangered Species Act (1973) Section 7 Consultation.....	51
4.4	Tribal Coordination and Consultation.....	51
4.4.1	Indian Sacred Sites (Executive Order 13007).....	52
4.4.2	Indian Trust Assets (ITAs)	52
4.4.3	Other Laws and Regulations.....	52
Chapter 5	Literature Cited.....	53
Appendices		
Appendix A	Tribal and Cultural Correspondence	
Appendix B	Scoping	
Appendix C	ESA Correspondence	
List of Figures		
Figure 1.	Project Vicinity Map.	2
Figure 2.	Project Study Area Map.	3
Figure 3.	Location map of subreaches between RM 21.10 and RM 21.80 and anthropogenic features (Figure 15 from RA) (Reclamation 2009b).....	5
Figure 4.	Potential habitat actions by subreach and their relative priority of implementation.....	7
List of Tables		
Table 1.	Common Wildlife Species.	30

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Chapter 1 Introduction

This Environmental Assessment (EA) evaluates a range of alternatives for habitat complexity and bank rehabilitation construction on the Preston Reach of the Entiat River, Chelan County, Washington. The proposed action is being developed by the Bureau of Reclamation (Reclamation) in coordination with the U. S. Forest Service (USFS), Washington Department of Fish and Wildlife (WDFW), the U. S. Fish and Wildlife Service (USFWS), the Upper Columbia Regional Technical Team (RTT), and the project sponsor-Cascadia Conservation District (CCD), to improve and protect anadromous fish habitat and stream health within the Preston Reach of the Entiat River.

This EA will determine whether to issue a Finding of No Significant Impact (FONSI) or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS). As required by the National Environmental Policy Act (NEPA) of 1969 and subsequent implementing regulations promulgated by the Council of Environmental Quality (CEQ), this assessment explores a reasonable range of alternatives for habitat complexity construction and potential environmental effects of these proposed actions.

The impacts of each alternative were evaluated for the potentially affected resource areas, including land use, geology and soils, water quality, wetlands, vegetation, fish and wildlife, threatened and endangered species, cultural resources including Indian sacred sites and Indian trust assets, socioeconomics, and cumulative effects.

1.1 Location and Background

The Entiat subbasin is located entirely in Chelan County, Washington. The Entiat River flows approximately 53 miles from its headwaters to where it enters into the Columbia River at river mile (RM) 482.7. The project lies in the Tyee Mountain, Washington U.S. Geological Survey (USGS) quadrangle (1981) in Sections 2, 3, 10, and 11, Township 27 North, Range 19 East, Willamette Meridian, Chelan County, Washington (Figure 1 and Figure 2).

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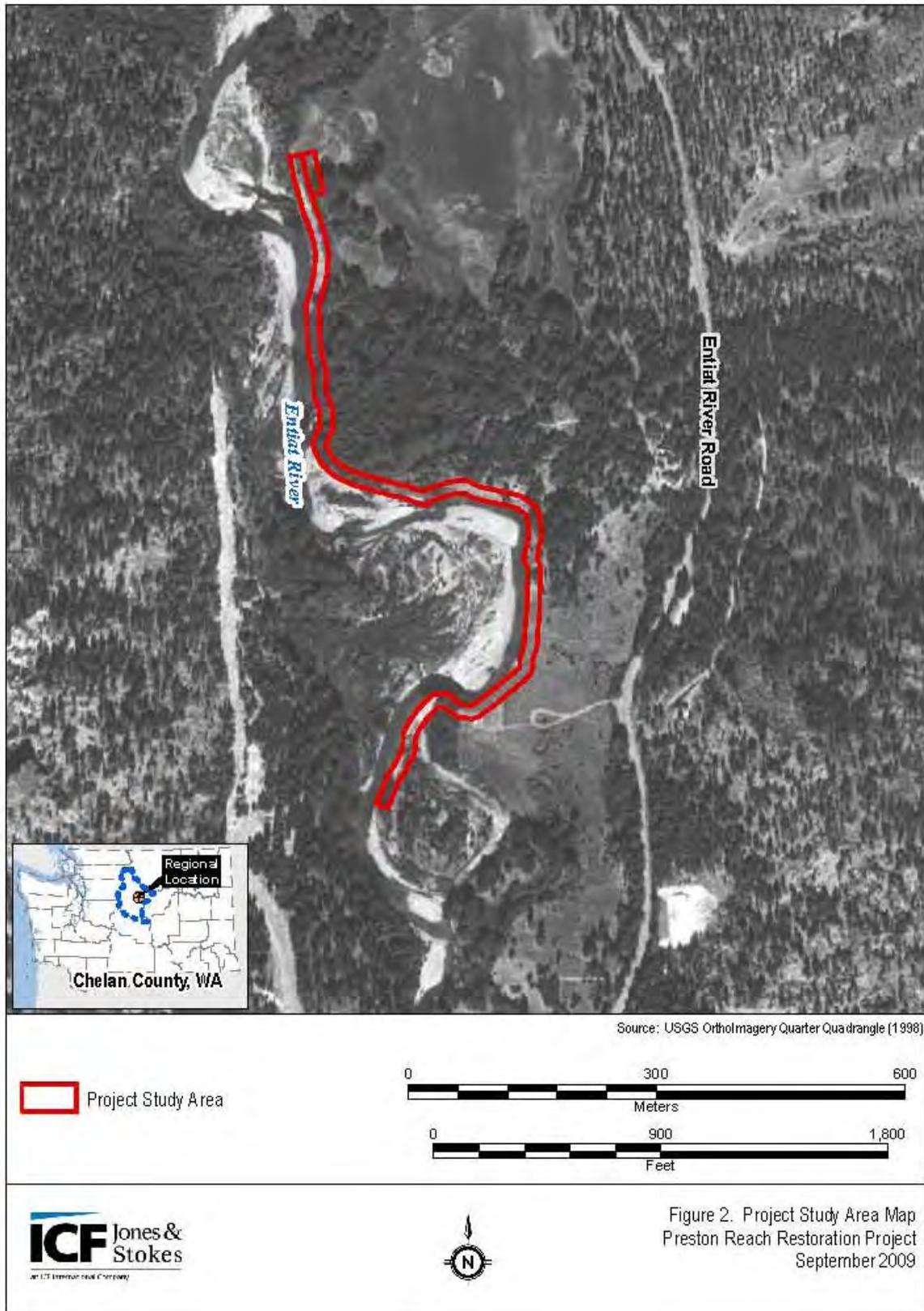


Figure 2. Project Study Area Map.

Following the TA, the Preston RA was finalized in July of 2009 and within the reach an Alternatives Evaluation Report (AER) was produced (January 2009), which lead to specific projects for design and implementation within the reach.

The Preston Reach, which extends approximately 2.1 miles along the river, was identified as one of the highest priority reaches for salmon recovery and fish habitat in the TA. The Preston Reach is characterized as an unconfined geomorphic reach type based on natural channel constraints. The Entiat River, in its natural state, historically maintained dynamic equilibrium by actively migrating laterally across its floodplain within the Preston Reach. The flat slopes and complex network of channels that result in a high degree of interaction between the active channel and its floodplain are typical of this unconfined geomorphic reach. The lateral channel migration maintains a lower energy and flatter channel gradient as sediment is stored before being eroded and transported downstream. The natural ecosystem processes of hydrologic, geomorphic, and vegetative regimes create a healthy stream characterized by a dynamic cycle of conversion from river to floodplain and vice versa, producing a continuous renewal of fish habitat. When interaction between these regimes is altered, it can negatively impact the availability of fish habitat and could threaten the continuation of the species within the basin. The Preston RA has identified four sub-reaches within the Preston Reach that have major anthropogenic alterations. Alterations include the construction of levees with rip-rap protection at two sites, placement of stream bank protection and clearing of vegetation with subsequent severe erosion at another site, and the placement of fill in the channel migration zone at a final site.

Multiple actions are necessary for rehabilitation and enhancement within the project reach between RM 21.10 and RM 23.1 or Reach 3A, which is located within the Entiat River floodplain, and includes native-dominated upland and wetland forest, one pond behind the Lower Preston Levee, pastures, and residences. The multiple actions being considered for this reach include possible levee removal, large wood placement, bank stabilization, rip-rap removal, livestock exclusion, and riparian plantings. However, not all the actions will immediately be agreed to by all landowners or funded for in one construction phase (Reclamation 2009a). Therefore, although Reach 3A will be evaluated as a whole system that will function in equilibrium, this EA will primarily be discussing a specific project within Reach 3A. The action area (Phase 1 or the Yurt site) is located between RM 21.4 and RM 21.5, which includes an eroded, 645 linear foot left bank within Preston Reach Inner Zone-4 (PR-IZ-4) (Figure 15 from RA) (Reclamation 2009b). The PR-IZ-4/Yurt site is located between RM 21.10 and RM 21.80 and covers about 12.93 acres of active channel, and contains about 0.30 acres of off-channel habitat (i.e., side channel).

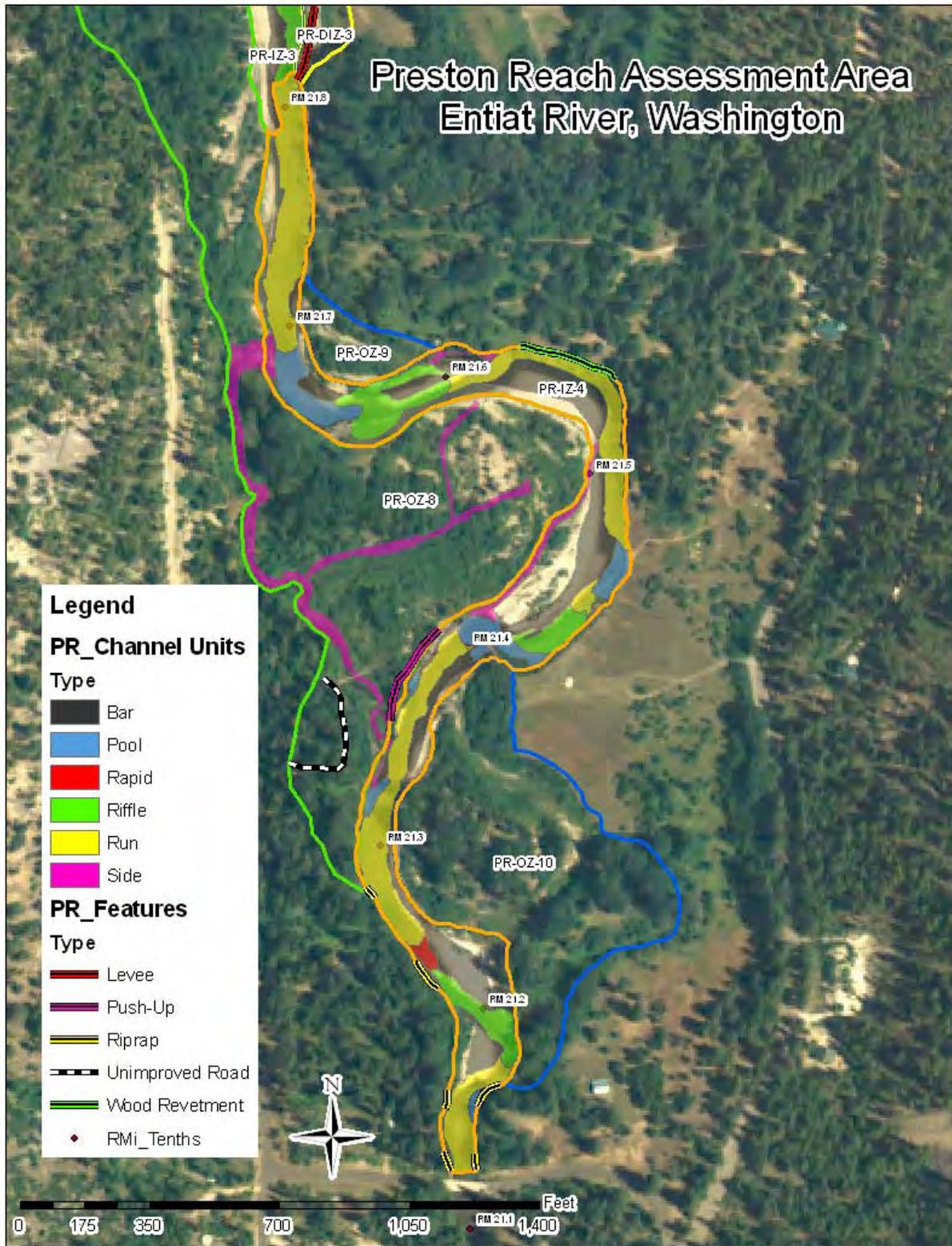


Figure 3. Location map of subreaches between RM 21.10 and RM 21.80 and anthropogenic features (Figure 15 from RA) (Reclamation 2009b).

1.2 Purpose and Need for the Action

The purpose of the proposed action is to provide improved habitat complexity (quantity and quality) for native endangered fish species including spring Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Oncorhynchus mykiss*), and bull trout (*Salvelinus confluentus*) and to partially meet the 2008 Biological Opinion for the Federal Columbia River Power System requirements for restoring fish passage and adding habitat complexity to the Entiat River (NOAA Fisheries 2008). The need for the action is to prevent further degradation of fish habitat in the Preston Reach. At the yurt site, the left bank (RM 21.40 to RM 21.45) is eroding due to the lack of riparian vegetation that would stabilize the bank. This erosion appears to be providing elevated levels of fine sediment to spawning gravel downstream (RM 21.4).

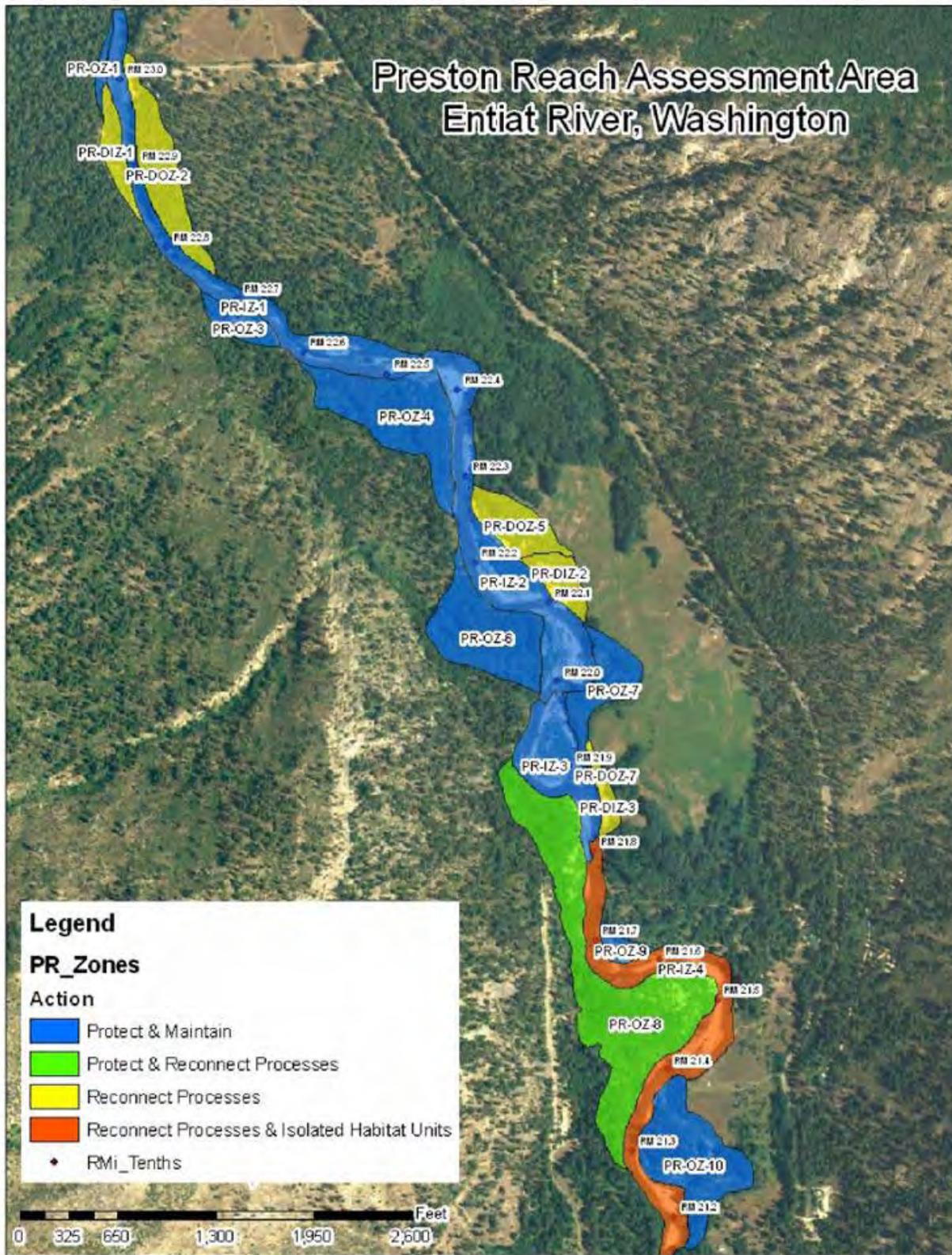


Figure 4. Potential habitat actions by subreach and their relative priority of implementation.

1.3 Scoping

The scoping process under NEPA is a course of action to request input from interested parties to help identify important issues and alternatives relative to the proposed action. ICF Jones & Stokes has, through the request of Reclamation, coordinated and documented public involvement as a part of this project's planning process.

The Entiat HSC is made up of fish biologists from a variety of local, state, and Federal agencies and public utility districts, and representatives from local municipalities, community and conservation groups, agriculture, and private citizens. The HSC oversees the Entiat Watershed Planning Unit (EWPU or Implementation Plan) and the Preston Reach Riparian Restoration Project (yurt site). Participants involved in the Implementation Plan and the identification, prioritization, and design of the restoration project are made up of a diverse group of stakeholders representing a wide range of interests including local governments and districts, citizens, tribes, state and Federal agencies, irrigation, agriculture, forestry, community groups, conservation groups, economic development, and recreation.

Development of the Implementation Plan was done through a voluntary, collaborative process supported through the 1998 Watershed Management Act (RCW 90.82) which provided the framework and funding for locally-based planning of water resource related issues (the EWPU). The HSC coordinates closely with the Upper Columbia Salmon Recovery Planning process and is active in identifying priority actions to protect and enhance habitat of threatened and endangered species throughout the watershed by improving overall habitat function and connectivity. HSC has conducted an extensive public outreach within the Entiat River Watershed to better understand limiting factors and public priorities. More detail on consultation, coordination, and public involvement may be found in Chapter 4 of this EA.

1.4 Authority

On October 20, 2007, the Assistant Deputy Secretary signed a memorandum re delegating authority to the Pacific Northwest Regional Director under the Fish and Wildlife Coordination Act (16 U.S.C. §§ 661 — 666c); section 5 of the Endangered Species Act (16 U.S.C. § 1534); and section 7(a) of the Fish and Wildlife Act of 1956 (16 U.S.C. § 742f(a)) that is required to perform off-site habitat improvements when required to comply with subsection 7(a)(2) of the Endangered Species Act (16 U.S.C. § 1536(a)(2)) regarding the construction and/or continued operation and maintenance of any Federal Reclamation project located in Reclamation's Pacific Northwest Region. This authority is to be used for the funding of two projects in the Entiat River basin. Reclamation would work with CCD to accomplish construction and construction management activities associated with the Preston Reach Habitat Complexity and the Entiat River Off Stream Wells implementation projects.

1.5 Regulatory Compliance

Various laws, Executive Orders, and Secretarial Orders apply to the proposed action and are summarized below. The legal and regulatory environment within which the Federal activity would be conducted depends on which alternative is implemented.

1.5.1 National Environmental Policy Act

NEPA requires that the action agency use a public disclosure process to determine whether or not there are any environmental impacts associated with proposed Federal actions. If there are no significant environmental impacts, a FONSI can be signed to complete the NEPA compliance.

1.5.2 Endangered Species Act

The Endangered Species Act (ESA) requires all Federal agencies ensure that their actions do not jeopardize the continued existence of listed species, destroy, or adversely modify their critical habitat. As part of the ESA's Section 7 process, an agency must request information from the USFWS and the National Marine Fisheries Service (NOAA Fisheries Service) on whether any threatened and endangered species occur within or near the action area. The agency then must evaluate impacts to those species. If the action may affect any listed species, the agency must consult with the USFWS or NOAA Fisheries Service.

1.5.3 National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, as amended, requires that Federal agencies consider the effects that their projects have on properties eligible for or on the National Register of Historic Places. The 36 CFR 800 regulations provide procedures that Federal agencies must follow to comply with the NHPA. For any undertaking, Federal agencies must determine if there are properties of National Register quality in the project area, the effects of the project on those properties, and the appropriate mitigation for adverse effects. In making these determinations, Federal agencies are required to consult with the State Historic Preservation Office (SHPO), Native American tribes with a traditional or culturally-significant religious interest in the study area, the interested public, and in certain cases, the Advisory Council on Historic Preservation.

1.5.4 Executive Order 13007: Indian Sacred Sites

Executive Order 13007, dated May 24, 1996, instructs Federal agencies to promote accommodation of access to and protect the physical integrity of American Indian sacred sites. A “sacred site” is a specific, discrete, and narrowly delineated location on Federal land. An Indian tribe or an Indian individual determined to be an appropriately authoritative representative of an Indian religion must identify a site as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion. However, this is provided that the tribe or authoritative representative has informed the agency of the existence of such a site.

1.5.5 Executive Order 12898: Environmental Justice

Executive Order 12898, dated February 11, 1994, instructs Federal agencies, to the greatest extent practicable and permitted by law, make achieving environmental justice part of its mission by addressing, as appropriate, disproportionately high and adverse human health or environmental effects on minority populations and low income populations. Environmental justice means the fair treatment of people of all races, income, and cultures with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment implies that no person or group of people should shoulder a disproportionate share of negative environmental impacts resulting from the execution of environmental programs.

1.5.6 Secretarial Order 3175: Department Responsibilities for Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States (with the Secretary of the Interior acting as trustee) for Indian tribes or Indian individuals. Examples of ITAs are lands, minerals, hunting and fishing rights, and water rights. In many cases, ITAs are on-reservation; however they may also be found off-reservation.

The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and executive orders. These rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires that officials from Federal agencies, including Reclamation, take all actions reasonably necessary to protect ITAs when administering programs under their control.

1.6 Related Actions and Activities

Extensive data has been collected since 2006 to develop the TA and RA and to analyze proposed alternatives for this specific project. All of the data collected for these efforts were provided to the Contractor. In addition, site visits, data gap analysis, NHPA Section 106 data collection, and other background material has been researched and reviewed to help identify the limiting factors affecting salmonid habitat within the Entiat watershed. Several other similar projects are proposed for the Preston Reach in addition to this Phase 1, but will not be analyzed in this EA.

Chapter 2 Alternatives

2.1 Introduction

The proposed action is not only rehabilitation of an existing eroding bank, but construction of habitat complexity that will support and augment anadromous fish and other aquatic and terrestrial organisms within the Preston Reach (PR-IZ-4) and Entiat River (RM 21.4 to RM 21.5). Each alternative was analyzed for its ability to meet project goals and restoration objectives for the entire Preston Reach. All alternatives adhere to Federal laws and regulations; Colville Confederated Tribal laws; and if applicable, State and County laws and regulations. Prior to any ground disturbing activities, the appropriate level of site-specific NEPA analysis will be conducted.

This chapter presents the following alternatives based on the ICF Jones & Stokes 2010 AER (ICF Jones & Stokes 2010) concerning the implementation of the bank rehabilitation project. The alternatives are based on current engineering practices including key features such as bank length, volumes of material removed, area of disturbance, bench widths, and other analytical input.

- Alternative A – No Action - Relocate Existing Yurt
- Alternative B – Riparian Plantings Including Wet Bench
- Alternative C – Install Large Woody Debris (LWD) (Discontinuous Bank Treatment)
- Alternative D – Install LWD and Regrade Bank to Install Bench Planting (Preferred Alternative)
- Alternative E – Install LWD, Rebuild Existing Bank using Bar Materials, and Install Bench Planting
- Alternative F – Install LWD, Remove Point Bar, and Install Bench Planting

NEPA typically defines the No Action Alternative as the most likely future condition without the proposed action. The No Action Alternative serves two purposes:

- It identifies future environmental conditions without the actions to rehabilitate the bank or provide habitat complexity.
- It is the basis (baseline condition) by which all other alternatives are compared.

The five action alternatives provide different techniques to accomplish the purpose and need for the action. The six alternatives currently presented above represent all of the alternatives evaluated; none were eliminated from further consideration.

2.2 Similarities Among Alternatives

For all alternatives, the upland area from RM 21.4 to RM 21.5 of the project area has good construction access and staging areas. For all alternatives, the only existing infrastructure is a yurt, which in all alternatives will be relocated to the east away from the bank. For Alternatives B and D through F, a wet bench and riparian plantings are proposed, and for Alternatives C through F, LWD structures are proposed. Similar techniques and detail are used for each alternative.

2.3 Alternative A – No Action - Relocate Existing Yurt

The No Action Alternative proposes to move the existing yurt to a new location within the current landowner's property, outside the potential migration area of the Entiat River thus allowing the erosion to continue. Moving the yurt is a component of every alternative presented in this EA. The relocation site of the yurt would be to the east toward the Entiat River Highway. The yurt is located on property that is inundated by floodwaters during the Base Flood Elevation (BFE) or more commonly described as the 100-year flood.

Implementing this alternative does not provide habitat or biological benefit nor does it reduce the unnatural rate of erosion and addition of fine sediment to the reach.

2.4 Alternative B – Riparian Planting Including Wet Bench

Alternative B proposes to construct a wet planting bench excavated below the ordinary high water level along the top of the existing bank adjacent to the river with an accompanying riparian planting zone behind (landside) the wet bench at existing grade. The overall width of the planting zone would be approximately 100 feet. The bench would vary in width from approximately 30 feet to 40 feet, 3 feet to 4 feet deep and transitioned at a gentle slope to the existing grade. The bench would create a narrow, frequently accessed floodplain along the top of the bank and planted with species such as willows, dogwoods, cottonwoods, and alders. Floodplains normally act to diffuse flow, reduce velocities, and deposit sediments for new plant growth. The remaining 100-foot width would be dedicated to riparian plantings such as ponderosa pine, Douglas fir, and native shrubs. The 100-foot band of plantings would provide the root structure necessary to stabilize the riverbank long-term and arrest the erosion rate to a more natural or normal rate.

2.5 Alternative C – Install LWD (Discontinuous Bank Treatment)

Under Alternative C, several LWD structures would be constructed along the existing bank. There are two types of proposed bank LWD structures. The first is a multilevel LWD structure composed of a footer log with four logs with rootwads laid perpendicular to the bank and two logs with rootwads laid parallel to the bank. The second structure is similar but with only two perpendicular and one parallel logs.

The inbank LWD structure would move the highest velocity field away from the bank toward the thalweg of the river. The rootwads would act to increase the roughness along the bank, thereby diffusing the flow, reducing local flow velocities, and allowing for local deposition of fine materials.

Large numbers of logs and rootwads for each structure would be needed to produce the height required to protect the existing bank from erosion. The placement of the logs with rootwads would produce habitat by creating local scour, provide cover, and collect additional wood during high-flow events. While producing habitat, the bank LWD structures would promote sediment deposition between each structure, helping to further protect the existing bank toe.

Alternative C provides a higher likelihood of success (limiting bank erosion) when compared to a planting-only option. The proposed structures would provide stability to the bank by recruiting new wood and sediment, providing habitat, and redirecting the energy from flowing water to reduce the stress on the bank. What Alternative C does not provide is long-term stability with the introduction of vegetation. The long-term stability of the bank requires vegetation with adequate root depth and mass to arrest the current rate of erosion. Additionally, once the structures are installed, the likelihood of erosion of the fill over the logs is increased without vegetation to hold the soil together.

2.6 Alternative D - Install LWD, Regrade Bank to Install Bench Planting (Preferred Alternative)

Alternative D is a combination of structures of Alternative C with the planting plan of Alternative B. This alternative would provide the immediate structural stability provided by the bank and longitudinal LWD structures with the long-term-stability from the plantings.

Alternative D offers a greater long-term likelihood of success by establishing the planting zones behind the proposed LWD structures. The LWD structures would provide the short-term stability to allow the plantings to mature, while providing the increased habitat attributes in the reach.

2.7 Alternative E – Install LWD, Rebuild Existing Bank using Bar Materials and Install Bench Plantings

Alternative E proposes to reconstruct the existing left bank with material excavated from gravel bars on the right bank, then incorporating similar LWD structures and a planting scheme similar to Alternative D. The excavation of borrowed material, cobbles, gravels, and sands would form a channel that would be used to divert flow in the Entiat River to reduce the potential for introducing sediment during construction. A connection to the river would be made at the downstream end, and at the upstream end, and a coffer dam would be constructed across the main stem just below the upstream connection.

The excavated material would be placed along the existing left bank in a manner to improve the existing bank geometry, creating a more efficient flow path through the bend. Currently, the bank geometry is composed of a series of sharp bends with short tangent sections, which leads to accelerated erosion at the bends. Reconstruction of the bank, with the excavated material composed of cobbles, gravels, and sands, would be placed with a 2:1 slope on the water side and extended to an elevation below the ordinary high water level where the wet bench is planned, consistent with Alternatives B and D. In addition, the composition of the borrowed material from the right bank would be more resistant to erosion than the composition of the existing bank.

The same LWD structures proposed under Alternative C would be used under this alternative as well. The structures would be arranged in a different geometric pattern than discussed in Alternative D since the bank would be moved and reshaped from the existing condition. The bank LWD structures would provide not only short-term stabilization, while the planned vegetation matures, but would also provide significant habitat in the river. The longitudinal LWD structures would provide a method of increasing sediment deposition along the bank and habitat at the upstream end of the structure.

Alternative E provides the greatest assurance of success of the six alternatives but creates the greatest disturbance. Reconstruction of the bank with less erodible material, installation of LWD structures, and adding extensive planting ensure long-term stability for the river bank.

2.8 Alternative F – Install LWD, Remove Point Bar and Install Bench Plantings

Alternative F is almost identical to Alternative D, but would remove material from the point bar located on the right bank. If the point bar is removed, there would be a reduction in velocity and shear on the left bank. Alternative F has the potential benefit of reducing the energy or work along the left bank while the planting becomes established.

Excavated material from the point bar would be taken offsite. As with Alternative E, the process of maneuvering equipment within the riverbed to remove the excavated material would cause a great deal of disturbance. Making these trips within the riverbed would increase sediment load into the system and likely disturb migrating fish.

2.9 Construction

The key elements of construction include construction sequencing, site preparation, and staging and site access. These elements are described below.

2.9.1 Construction Sequencing

Construction is planned for the low-flow fall months and is expected to take 6 weeks to complete. The complexity structures will require in-water work but the work will be conducted by equipment working in the dry above the ordinary high water level. In-water work that affects the mainstem of the Entiat River will be conducted within the USACE/WDFW-approved in-water work window (July 16 through July 31). An extension to this in-water work window was requested and USFWS recommended that in-water work after September 15 be constrained to the period that begins an hour after sunrise and ends an hour before sunset. This measure would allow bull trout to have the entire twilight and nighttime periods for undisturbed migration and will also provide an opportunity for sediment pulses generated by construction to settle and dissipate before nighttime movements of bull trout begin.

2.9.2 Site Preparation

Site preparations will include clearing and grubbing activities such as removing existing debris and vegetation to allow equipment access for performing grading work and the LWD installations. Some of the native soil material will be used to form the contours as proposed; the remaining fill will be disposed of offsite.

Temporary erosion and sediment control will consist of implementing standard erosion control best management practices (BMPs) to minimize the input of sediment into the Entiat River. The details of a temporary erosion and sediment control plan will be drafted prior to construction and will be guided by permit conditions. Standard BMPs during construction will include installing silt fencing at the edge of the clearing limits and hydroseeding with native grass seed mix. The protection of native vegetation includes installing perimeter fencing to delineate the extent of clearing activities and identify the vegetation to be preserved. Additional pre construction surveys will be necessary to determine the number of trees to be preserved.

2.9.3 Staging and Site Access

A staging area is available along the north side of the existing driveway. This area is large enough to accommodate storage of equipment, tools, and materials. Entrance to the construction area is from Entiat River Highway through the existing driveway into the landowner's property. Access to the grading area and each of the LWD structures will be achieved by crossing the property where open.

Chapter 3 Affected Environment and Environmental Consequences

This chapter describes the PR-IZ-4/Yurt site project area and the existing physical, biological, natural, and cultural resources that could be affected and identifies any potential impacts or benefits to those resources if any one of the alternatives were implemented. The No Action Alternative (Alternative A) describes conditions in the future if bank rehabilitation and habitat complexity are not implemented and provides the basis to compare the action alternatives (Alternatives B, C, D, E, and F).

The resources analyzed within the PR-IZ-4/Yurt site project area include land use, geology and soils, water quality, wetlands, vegetation, fish and wildlife, threatened and endangered species, cultural resources, Indian sacred sites, Indian trust assets, and socioeconomics.

3.1 Land Use

3.1.1 Affected Environment

Past land use practices such as trapping, grazing, logging and associated road construction, and early flood prevention and agricultural practices that were initiated before the turn of the 20th century and continued through the 1970s have contributed to some of the current resource problems and habitat degradation within the Entiat watershed (CCCD 2006). Between the Wenatchee National Forest boundary at RM 26 and RM 11.7, the land use is primarily rural residential, either year-round or seasonal use, with a few dispersed pasture areas.

River straightening and damming from historic logging activities in the early 1900s is also evident. Currently, only one timber mill is still in operation (CCCD 2004). Wildfires, fire suppression, and reductions in timber harvest have increased forest fuels. These practices, along with grazing and other land use activities, have also altered vegetation community structure in some areas.

Channelization/diking associated with early-to-mid-century flood control practices have simplified aquatic habitat conditions dramatically, particularly in the lower portion of the mainstem Entiat River. The Entiat River Subbasin Salmon and Steelhead Production Plan (Yakama Nation et. al.1990) identified water withdrawals, both agricultural and domestic, as an issue of concern relative to their potential to exacerbate normal low flows of late summer in the Entiat River. Irrigated cropland comprised of apple and pear orchards, which are primarily located downstream from the town of Ardenvoir.

Recreational uses, such as cabins and campgrounds, are mostly upstream of Ardenvoir (Kirk et al. 1995). Recreationists have enjoyed hunting and fishing in the Entiat valley for many years. Hunting mule deer and fishing for local trout were important recreational and subsistence activities for local residents. Residents of the Entiat valley are interested in maintaining or

improving the health of the watershed, sustaining agricultural production, enhancing community viability, restoring fish populations and fishing opportunities, and minimizing potential impacts of future growth and development (CCCD 2006).

3.1.2 Environmental Consequences

Alternative A - No Action

Under the No Action Alternative, measures to rehabilitate the bank and provide increased habitat complexity in the vicinity of the yurt would not be implemented. The Entiat River would continue to seek its natural course throughout the Preston Reach and erosion would continue on the left bank. Livestock, agriculture, recreation activities, and other land uses would continue to be managed as they are now.

Alternatives B through F

Although all of the alternatives may increase temporary disturbance to the existing environment, the construction activities would not affect land uses and the landowner may continue to use the recreational yurt site, following relocation.

3.2 Geology and Soils

3.2.1 Affected Environment

Field surveys and evaluations were conducted in the Preston Reach during the 2008 field season to determine the condition of the geomorphic, hydrologic, and vegetative regimes. Ecosystem processes in the Preston Reach are in a moderately degraded state as a result of anthropogenic impacts. The dynamic interactions between the three regimes have been impacted by levees, bank protection, and development. These features have reduced the overall floodplain connectivity and resulted in localized changes in sediment transport and deposition.

Geology

At the tributary scale, three valley segments (VS) were delineated (VS-1, VS-2, and VS-3). Six geomorphic reaches were delineated for VS-3 and characterized into two general geomorphic reach types based on natural channel constraints, referred to as confined and unconfined geomorphic reaches. Reach 3A was designated as unconfined and had the highest geomorphic potential and the largest impact from anthropogenic features for VS-3 (i.e., more departed from a natural condition).

This 1.5-mile Reach 3A is a naturally unconfined, low gradient (less than 1 percent) channel segment comprised mainly of lateral scour pools and short riffles. The reach is a depositional reach, with large point bars and frequent meander bends. A levee, which protects a ranch along most of the left bank between RM 21.8 and RM 22.4, may be preventing the stream from

laterally migrating to the east (most of the dike is set back from the stream bank). The channel is fairly sinuous despite the levee, with a sinuosity value of about 1.4 (measured channel distance divided by straight line distance). At the yurt site, the bank is actively meander eroding approximately 520 linear feet of the left bank. The streambanks are vertical and the terrace is basically void of riparian vegetation (ICF Jones and Stokes 2010.)

Soils

Soil types in the Entiat watershed are conducive to runoff and erosion. Grazing, road construction, timber harvest, and development have exacerbated the problem by compacting soil and reducing infiltration. It is thought that over-grazing by domestic animals in the Entiat at the turn of the 20th century may have contributed to surface soil changes which have reduced soil moisture storage, increased soil moisture stress, and promoted loss of native grass understories (CCCD 1999); (NPPC 2002).

The main channel's left bank in Preston Reach 3A at the PR-IZ-4 site is composed of loose deposits of sand and gravel that are highly susceptible to erosion. About 10 percent of the banks are actively eroding in the Reach 3A. The erosion at PR-IZ-4 site was caused both by natural causes, at the bends in the river, and from the removal of vegetation for agriculture and development. A 530 foot segment of the left bank of the river between RM 21.4 and RM 21.5 is eroding at a "very fast rate" (5-feet per year since 1998). About 500 feet of bank just upstream of the eroding bank is protected by wood structures. The loose nature of the alluvium and the lack of any significant riparian vegetation to help anchor the bank indicates that bank erosion would continue in this area.

Substrate and fine sediment within the study area are typical for the Middle Entiat River valley. Flood deposited sands and cobble alluvium are the dominant substrate type in the floodplain and a coarse sandy material with cobbles make up the various levees. Two pebble counts were conducted in Reach 3A. About 13 percent of the substrate at the pebble counts sites consisted of fine sediments less than 6 mm, which is considered functioning at risk in the USFWS Matrix of Pathways and Indicators (less than 12 percent surface fine sediments less than 6 mm is considered functioning properly). While very fine sediments were abundant in some of the pools above the tail crests (in the scour), the pools generally had less fines than the pools in Reach 1. Substrate embeddedness did not appear to be a problem in the reach.

3.2.2 Environmental Consequences

Alternative A - No Action

Meandering river systems, such as that observed for the Entiat River through the Preston Reach, tend to be very active and dynamic systems characterized by downstream migration of meander belts, frequent channel changes, and recycling of the adjacent floodplain through lateral erosion of channel banks and associated floodplain deposits. The No Action Alternative will allow these natural processes to continue unchecked, thereby allowing continued erosion of the main channel's left bank.

Alternative B - Riparian Planting

Alternative B would provide minimal stabilization to the left bank of the Entiat River. Vegetative growth would not be able to establish soon enough to control bank loss and would not provide immediate habitat complexity though long-term, this alternative would be beneficial. This alternative would have the least impact to the existing environment; however, it would not provide the rehabilitation and complexity needed for the existing streambank or to prevent future channel migrations. The construction activities would result in minimal disturbance, excavation, and removal of the geologic materials of the main channel.

Alternative C - Discontinuous Bank Treatment (LWD) Alone

LWD structures proposed for Alternative C would provide moderate bank stabilization at the yurt site. This alternative would provide a protective barrier to the bank and slow the rate of erosion; however, continued erosion between the structures could occur causing flanking from channel migrations. It may require periodic maintenance to replace the LWD structures and would not provide the greatest rehabilitation and complexity or prevent future channel migrations. The construction activities would result in increased disturbance, excavation, and removal of the geologic materials of the main channel when compared to Alternatives A and B, but these contributions of sedimentation would be temporary and be curbed via silt fences and other BMPs.

Alternative D - (Preferred Alternative)-Discontinuous Bank Treatment, Wet Bench and Riparian Planting

Alternative D, a combination of Alternatives B and C, would maximize protection of the main channel through construction of LWD structures while bioengineered terracing and riparian planting in between the structures in the wetland bench and riparian bench would minimize disturbance at the yurt site. For this alternative, the LWD structures would be constructed in the main channel, similar to Alternative C. Alternative D's terracing of the wetland bench and riparian area would increase geologic material excavation and disturbance, compared to Alternatives B and C, but these contributions of sedimentation would be temporary and be curbed via silt fences and other BMPs.

Alternative E - Bank Reconstruction Including Alternative D

Alternative E was developed to minimize velocity disturbance of the main channel bank through construction of a side channel on the right bank. In addition to the LWD structures and terracing, this alternative would provide long-term, maximum protection at the yurt site and create moderate instream habitat complexity. Under this alternative, a side channel constructed in the main channel on the right bank gravel bar would curb some of the main channel velocity directed at the left bank. Alternative E's side channel, LWD, and terracing of the wetland bench and riparian area would excavate and disturb the greatest amount of geologic material when compared to Alternatives B, C, D, and F.

Alternative F - Point-Bar Removal Including Alternative D

This alternative was proposed to increase hydraulic efficiency and reduce erosive forces to the left bank, while allowing the thalweg or main flow to shift more to the right bank. In addition to the LWD structures and terracing, this alternative would provide long-term, maximum protection at the yurt site and create moderate instream habitat complexity. The point-bar removal would likely reform and, therefore, the benefits from increasing channel capacity would be short-lived. This alternative would excavate and disturb a greater amount of geologic material compared to Alternatives B through D and similar to, but not as much as, Alternative E.

3.3 Water Quality

3.3.1 Affected Environment

The Environmental Protection Agency (EPA) and Washington Department of Ecology (WDOE) are responsible for carrying out the Clean Water Act (CWA), including overseeing the development of and implementation of Total Maximum Daily Load (TMDL) plans. Additional data was collected to determine the overall Water Quality Index (WQI) for the Entiat River. The overall WQI ranged between a score of 79 and 93, which met state performance standards.

Turbidity

Analysis conducted by the WDOE indicates the values for turbidity from 1994 to 2007 met state performance standards. Based on this finding, the turbidity indicator for the Entiat River is interpreted to be in an Adequate Condition.

Water Temperature

Analysis conducted by the WDOE and the USFS indicate that water temperature has exceeded the Index of Thermal Stress (ITS), the number of degree-days that temperature has exceeded the criterion, during summer. In the lower Entiat River, late summer water temperatures are not a serious problem; however, the lower Entiat has been on Washington State's 303(d) list since 1992 as temperature and pH have exceeded state standards. Maximum temperatures are typically less than 15° C, which is tolerable for rearing juveniles. Anthropogenic activities have negatively impacted water temperature due to the removal of riparian vegetation for agriculture and residential development (NPPC 2002).

pH

At some sites within the Entiat subbasin, pH readings reached 8.5, which exceed standards, but the causes are not known and are assumed to be partly of natural conditions (NPPC 2002).

Sediment

Sediment levels, especially fine sediments, are derived from both natural and human-caused (accelerated) sources and are affecting aquatic habitat and irrigation (NPPA 2002). Data from sediment core sampling indicates that the natural range of variability of fine sediment loading in the Entiat River subbasin may be very broad. Localized areas of accelerated bank erosion are noted in the Preston Reach (RM 21.4 to RM 21.5). Although background levels of fine sediment are interpreted to be relatively high in the Entiat drainage, fine sediment input is exacerbated at “point sources” due to removal of woody vegetation for agricultural development resulting in accelerated bank erosion.

Other Parameters

The Stillwater area has alluvial valley fill and the groundwater is interpreted to be hydraulically connected with the Entiat River. The effects of domestic well withdrawal on river base flows are a “data gap” and have not been evaluated.

Failing or substandard septic systems and/or surface runoff from home sites in some locations may be carrying a variety of non-point source pollutants (e.g., pathogens, sediment, nutrients, etc.) that threaten water quality. Orchard management also involves use of a number of agricultural chemicals (sprays and fertilizers) that could contribute a potential risk to water quality (CCPUD 1998).

3.3.2 Environmental Consequences

The primary water quality concern associated with Alternatives B, C, D, E, and F is a short-term increase in turbidity, due to construction-related sediment discharge to the Entiat River. The increase would primarily occur during river construction activities that disturb existing sediment or introduce new sediment at or below the ordinary water line. Sediment may also enter the river via storm water from the construction site during precipitation events, but comparatively speaking this amount is expected to be minimal and may not occur if precipitation is not encountered during construction.

Alternative A - No Action

Under the No Action Alternative, no additional geologic material will be added to the banks and the current rate of bank erosion and resulting in-river sediment load is expected to continue or increase slightly as banks become more unstable. The bank material is highly erodible and the river has the potential to migrate across and inundate the entire yurt site. Current trends and fluctuations in localized bedload and river bed particle size distribution are expected to continue as well. Although slight changes may occur over brief timelines, they will be in response to natural events and will not persist over extended periods. Due to the controlled nature of the river flow, mass sediment wasting is not expected under normal conditions; however, given the already erosive nature of the river banks, flood events could increase the risk of mass wasting.

Alternative B - Riparian Planting

Under Alternative B, a total of 645 linear feet of bank line would be treated. Construction associated with this alternative would include some clearing of surface material, but is not expected to have an effect on water quality, particularly from a sediment standpoint. The construction may consist of developing paths for equipment and grading locations for riparian planting to establish. The development of construction paths for the riparian terrace above the river bank is not expected to affect water quality. However, the development of paths directly to the river for purposes of wetland bench revegetation would likely disturb the sediment enough to cause brief periods of turbidity.

Other water quality concerns associated with the action alternatives include short-term increases in nutrient levels and construction related pollutants such as oil and grease. However, the effects of these pollutants on water quality are expected to be minimal, if even detectable. All appropriate construction BMPs would be used to minimize runoff during this period.

Alternative C - Discontinuous Treatment (LWD Structures)

A total of 14 LWD structures would be constructed within the project area and placed on the 500-foot main channel left bank. Similar to Alternative B, the development of construction paths on the terrace above the river bank is not expected to affect water quality. However, the development of paths directly adjacent and perpendicular to the river for purposes of constructing the wetland terrace and LWD structures may disturb the sediment enough to cause brief periods of turbidity. The potential for erosion remains, particularly during storm events. Again, all appropriate construction BMPs would be used to minimize runoff during this period.

Minimal material would be removed to construct the structures in the reach; however, the placement of these structures is expected to result in a temporary increase in turbidity though the structures would be installed out of the river on an existing point bar or from above the left river bank. The placing and shaping of the structures is expected to result in large amounts of sediment discharge with this alternative, since the toe end of the structures is expected to be near and below the ordinary water line. The initial placement of LWD on the bank line and river bottom would result in a large amount of sediment causing brief periods of turbidity. For each structure, material would be placed in the river beginning at the bank and would be slowly extended into the river until the desired structure length and positioning is reached. The periods of sediment discharge resulting in turbidity increases are expected to be short-term in duration, with the bulk of the disturbance occurring during initial placement of material on the river bottom.

Following construction of the structures, the thalweg would likely move toward the tips of the structures and create large pools. This shift in the thalweg would result in temporary scouring at tips of the structures. However, the scouring would subside over time as the thalweg stabilizes and is not expected to result in a substantial increase in sediment load. In addition to a shift in the thalweg, the river may also exhibit sediment deposition between the structures.

Alternative D - (Preferred Alternative)-Discontinuous Bank Treatment, Wet Bench and Riparian Planting

This alternative combines the discontinuous bank treatment with wet bench and riparian planting. A total of 645 linear feet of bank in the main channel would be shaped for the construction of a bioengineered, wet bench and riparian terrace, and 14 LWD structures would be placed for habitat complexity and additional stability.

While this is a combined alternative, the development of construction paths is the same as described in the previous alternatives. The development of paths on the terrace above the river bank is not expected to affect water quality. However, similar to the other alternatives, the development of paths directly adjacent and perpendicular to the river for purposes of constructing the LWD structures on the main channel may disturb the sediment enough to cause brief periods of turbidity.

The construction of the vegetated terrace and installation of the LWD structures on the left bank is expected to remove a total of 2,100 cubic yards (yd³) of material. The initial placement of the structures and benches is expected to result in a large amount of turbidity, since the placement would occur below the ordinary water line. However, these periods of increased turbidity are expected to be short-term in duration and are not expected to chronically affect water quality. The potential for erosion remains, particularly during storm events. Again, all appropriate construction BMPs would be used to minimize runoff during this period.

The initial placement of LWD on the bank line and river bottom would result in a large amount of sediment causing brief periods of turbidity. For each spur, material would be placed in the river beginning at the bank and would be slowly extended into the river until the desired spur length and positioning is reached. The periods of sediment discharge resulting in turbidity increases are expected to be short-term in duration, with the bulk of the disturbance occurring during initial placement of material on the river bottom.

Following construction of the structures, the thalweg would likely move toward the tips of the structures and create large pools. This shift in the thalweg would result in temporary scouring at tips of the structures. However, the scouring would subside over time as the thalweg stabilizes and is not expected to result in a substantial increase in sediment load. In addition to a shift in the thalweg, the river may also exhibit sediment deposition between the structures. This deposition would further assist in stabilization and possible vegetation growth along the bank in the long-term.

Alternative E - Bank Reconstruction Including Alternative D

This alternative combines Alternative D with excavation of a side channel on the right bank and addition of the excess material to be placed on the left bank. A total of 645 feet of left bank would be protected by 14 LWD structures while 700 feet, or 5,100 yd³ of right bank side channel would be excavated to temporarily recruit new habitat and redirect high velocity flows away from the left bank.

As with Alternatives B, C, and D, the development of construction paths on the terrace above the river bank is not expected to affect water quality. However, the development of paths directly adjacent and perpendicular to the river for purposes of construction may disturb the sediment enough to cause brief periods of turbidity.

This alternative would have the greatest total volume of 5,100 yd³ of material removal and disturbance in order to create the side channel and construct the LWD structures. The placing and shaping of the structures is expected to result in the large amounts of sediment discharged with this alternative, since the additional material from the right bank would be added in between the structures on the left bank wet bench (1,000 yd³). For each structure, material would be placed in the river beginning at the bank and would be slowly extended into the river until the desired spur length and position is reached. The period of sediment discharge resulting in turbidity increases are expected to be short-term in duration, with the bulk of the disturbance occurring during excavation of the side channel.

Following construction of the structures and with the additional bank fill material, the thalweg would likely move toward the tips of the structures and create large pools. This shift in the thalweg would result in temporary scouring at the tips of the structures. However, the scouring would subside over time as the thalweg stabilized and is not expected to result in a substantial increase in sediment load. With the additional material and the shift in the thalweg, the river may also exhibit increased sediment deposition between the structures. This deposition would further assist in stabilization and possible vegetation growth along the bank in the long-term.

Alternative F - Point Bar Removal including Alternative D

This alternative combines Alternative D with excavation of the inside edge of the right bank point bar. A total of 645 feet of left bank would be protected by 14 LWD structures, while 900 feet, or 1,600 yd³ of right bank point bar would be excavated to increase hydraulic efficiency and reduce erosive forces to the left bank.

As with the other action alternatives, the development of construction paths on the terrace above the river bank is not expected to affect water quality. However, the development of paths directly adjacent and perpendicular to the river for purposes of construction may disturb the sediment enough to cause brief periods of turbidity.

This alternative would have a large volume with 1,600 yd³ of material removed and disturbed, in order to excavate the point bar and 2,765 yd³ to construct the wet bench and install the LWD structures. Although the placing and shaping of the structures and benches is expected to result in large amounts of sediment discharged with this alternative, a greater amount of discharge would be expected from the point bar removal. For each structure, material would be placed in the river beginning at the bank and would be slowly extended into the river until the desired length and position is reached. The periods of sediment discharge resulting in turbidity increases are expected to be short-term in duration, with the bulk of the disturbance occurring during excavation of the side channel.

Following construction of the structures and with the increased channel capacity from the removal of the point bar, the thalweg would likely move toward the tips of the structures and create large pools. This shift in the thalweg would result in temporary scouring at the tips of the structures. However, the scouring would subside over time as the thalweg stabilized and is not expected to result in a substantial increase in sediment load. With the additional material and the shift in the thalweg, the river may also exhibit increased sediment deposition between the structures. This deposition would further assist in stabilization and possible vegetation growth along the bank in the long-term.

3.4 Wetlands

3.4.1 Affected Environment

ICF Jones & Stokes (2009a) delineated two wetland study areas, within Reach 3A, where proposed activities would be performed, using the routine determination methodology outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (i.e., the '1987 Manual') (Environmental Laboratory 1987), as updated by the *2008 Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2008).

These study areas were labeled; the Lower Preston Wetland Delineation Study Area (Wetland A) and the Upper Preston Wetland Delineation Study Area (Wetland B) (ICF Jones and Stokes 2009a). The wetland study areas are located between RM 21.3 and RM 22.0 along the left bank of the Entiat River. The Wetland A delineation located between the north side of RM 21.3 and RM 21.5 was conducted to include the PR-IZ-4/Yurt site project area. However, no Wetlands were found within the PR-IZ-4/Yurt site project area, but rather outside PR-OZ-10, so there are no affected wetlands within the proposed activity area.

3.4.2 Environmental Consequences

Due to the lack of a wetland within the activity area, the No Action Alternative and Alternatives B through F would have little or no impact to the existing wetlands and wetland functions would continue in their current state. The Army Corps of Engineers (Corp) and the Washington Department of Lands (WDL) through the CWA regulate the loss of wetland habitat through permitting programs that track the loss and creation of wetlands. The small area affected by the Preferred Alternative would not significantly alter wetland values. The Corp through the CWA 404 permitting process would determine how Reclamation would mitigate for the loss or change in character of the wetlands. Under the No Action Alternative, some wetlands may be lost with the continued erosion and alterations in floodplain flows. The action alternatives may also induce sediment deposition that could ultimately create a vegetated shoreline or a potential new wetland and riparian habitat that is currently lacking in the main channel area.

3.5 Vegetation

3.5.1 Affected Environment

Riparian vegetation near the yurt site location is dominated by mountain alder (*Alnus incana*, FACW), river birch (*Betula nigra*, FACW), and Douglas' hawthorn (*Crataegus douglasii*, FAC) with a sparse shrub understory dominated by snowberry (*Symphoricarpos albus*, FACU), red-osier dogwood (*Cornus stolonifera*, FACW), and Pacific willow (*Salix lasiandra*, FACW). The herbaceous understory is lacking in many areas but consisted of northwestern mana grass (*Glyceria occidentalis*, OBL), giant horsetail (*Equisetum telmateia*, FACW), sedge species (*Carex* spp.), and stinging nettle (*Urtica dioica*, FAC) (ICF Jones & Stokes 2009a).

The yurt is located northeast of Wetland A with a small outhouse located in forested upland. Although portions of the uplands in the study area are riparian in character and include some similar plant species as adjacent wetlands, they lacked hydric soil and wetland hydrology indicators. In addition, the vegetation, though still considered dominantly hydrophytic, trended from a dominant facultative wet understory to a more facultative or facultative upland understory of snowberry, clustered rose, false Solomon's seal (*Smilacina racemosa*, FAC), and colonial bentgrass (which was dominant in the surrounding upland pastures). Vegetation in the upland terraces and pastures include quackgrass (*Agropyron repens*, FAC), colonial bentgrass, knapweed (*Centaurea* spp.), mullen (*Verbascum thaspis*, UPL), and other weeds. Uplands were differentiated from wetlands based on changes in dominant vegetation, lack of hydric soil indicators, and lack of wetland hydrology indicators.

Exotic plant species are a problem in disturbed areas such as utility and transportation corridors, abandoned and semi-abandoned agricultural plots, gravel pits, grazing pastures, and construction sites. Widespread weeds include cheatgrass (*Bromus tectorum*), diffuse knapweed (*Centaurea diffusa*), and oxeye daisy (*Chrysanthemum leucanthimum*). Other species found in the Entiat subbasin are yellowstar thistle (*Centaurea solstitialis*), Canada thistle (*Cirsium arvense*), whitetop (*Cardaria draba*), common tansy (*Tanacetum vulgare*), scotch broom (*Cystius scoparius*), St. Johns wort (*Hypericum perforatum*), woolly mullen (*Verbascum thaspis*), and himalayan blackberry (*Rubus discolor*) (CCCD 1999; USFS 1996).

3.5.2 Environmental Consequences

Alternative A - No Action

Under the No Action Alternative, existing vegetation along the entire length of the proposed site will be influenced by the continued migration of meander and lateral erosion of banks. In this section of the main channel, vegetation is dominated by grasses because the bank height is too high above the normal water surface elevation to permit establishment of riparian vegetation. Potential flooding could increase erosion and loss of some vegetation.

Alternative B - Riparian Planting

Under Alternative B, a total of 645 feet of the main channel bank would be disturbed and some temporary loss of vegetation could occur during terrace construction. The terraces would benefit and protect upslope plants from disturbance caused by further erosion. Stabilizing the bank with vegetation alone would have a small, but overall positive effect by preserving and increasing the riparian vegetation along the river. There would be low habitat complexity in the short-term due to the lack of LWD structures and there would be a low potential for long-term vegetation establishment.

Alternative C - Discontinuous Treatment (LWD Structures)

Alternative C would disturb only the sections of the main channel bank where LWD and access to the structures are built. Vegetation and slopes between the LWD structures would remain undisturbed from construction and, over time, sediment accumulation between the structures would provide a base for vegetation growth. Stabilizing the bank with LWD structures alone would have a moderate, but overall positive effect by preserving and increasing the chances for riparian vegetation to reestablish along the river. This alternative would have moderate habitat complexity and moderate potential for long-term vegetation establishment and the potential for structural flanking.

Alternative D - (Preferred Alternative)-Discontinuous Bank Treatment, Wet Bench and Riparian Planting

Alternative D would result in the similar disturbance as Alternatives B and C where temporary removal of existing vegetation would occur in specific locations, including the transition zone for the main channel. Planting and seeding the terraces to increase vegetation reestablishment would reduce further erosion. Stabilizing the bank with both vegetation and LWD structures would have a high, but overall positive effect by preserving and increasing the chances for riparian vegetation to reestablish along the river. This would not only increase bank stability, but habitat complexity as well. With terracing and riparian vegetation, a decrease in the potential for flanking could occur.

Alternative E - Bank Reconstruction Including Alternative D

Alternative E would result in the greatest disturbance to existing vegetation. Temporary disturbance would occur in specific locations, including the transition zone for the main channel and to the area where the side channel would be excavated. This alternative would eventually stabilize the bank with both vegetation and LWD, but may take longer to establish than Alternative D due to the loose excavated soils that would be used to create the terraces. This alternative would have a moderate, but overall positive effect by preserving and increasing the chances for riparian vegetation to reestablish along the river and, therefore, not only increasing bank stability, but habitat complexity as well. With terracing and riparian vegetation, a decrease in the potential for flanking could occur. The movement of additional material from the side channel to the left bank would greatly increase temporary turbidity and sediment loads.

Alternative F - Point Bar Removal including Alternative D

Alternative F would result in increased, temporary disturbance to existing vegetation in specific locations, including the transition zone for the main channel. In addition, the material excavated from the point bar would temporarily increase turbidity and sediment load. With the temporary shift in the thalweg to deflect flows from the left bank, this alternative would have a moderate, but overall positive effect by preserving and increasing the chances for riparian vegetation to reestablish along the river and, therefore, not only increasing bank stability, but habitat complexity as well. With terracing and riparian vegetation, a decrease in the potential for flanking could occur. The movement of additional material from the point bar would greatly increase temporary turbidity and sediment loads.

3.6 Fish and Wildlife

3.6.1 Affected Environment

Resident Fish

Dominant resident species include westslope cutthroat trout and rainbow trout. Other species found in the Entiat subbasin include mountain whitefish, eastern brook trout (*salvelinus fontinalis*), redband trout (*Oncorhynchus mykiss gibbsi*), and bull trout (*Salvelinus confluentus*) (Andonaegui 1999, CCCD 1999). The upper Entiat River (above Entiat Falls) supports indigenous populations of rainbow and cutthroat trout. The WDFW supplemented these populations with annual stockings through 1996. The eastern brook trout was introduced upstream of Entiat Falls, but is no longer stocked; a self-sustaining population still exists. Roaring Creek supports a “pure” population of redband trout and the North Fork Entiat River and Lake and South Pyramid Creek have “good,” but not pure populations (MacDonald et al. 2000). Large numbers of fish have also been stocked in other areas of the watershed, especially the high mountain lakes (Andonaegui 1999). A recreational fishery exists for rainbow and brook trout (CCCD 1999). The Entiat subbasin also currently supports anadromous runs of native Chinook and steelhead, along with non-native sockeye.

Westslope Cutthroat Trout (*Oncorhynchus clarki lewisi*)

Westslope cutthroat trout are native to the interior Columbia Basin, but are geographically distinct from other populations in the northwest, which may be important in terms of conservation measures. Concerns over the species status include genetic introgression (especially with rainbow trout, depressed and fragmented populations, and the loss of migratory life histories [MacDonald et al. 2000]). Four significant populations of cutthroat trout reside in the Entiat subbasin. Two distinct groups inhabit the lower Cougar Creek, a tributary to the Upper Mad River, and Tommy Creek, a tributary to the Entiat River.

Wildlife

Historically, the types and numbers of wildlife present in the Entiat subbasin have varied as much as the habitats on which they depend. Fluctuations in habitat conditions, climate, wildfires, and other natural events have been a common occurrence in the subbasin. However, as European immigrants settled in the area trapping, shooting, domestic animal grazing development, logging, roads, altered riparian zones, and fire suppression exacerbated natural disturbances.

Impacts to the terrestrial environment have fragmented habitat for many species, while alterations to aquatic habitats have affected herons and other waterfowl, as well as amphibians, reptiles, and beavers (CCCD 1999).

Fire prevention and control policies of the early 1900s led to denser understory in the lower Entiat and to a greater number and variety of trees in mid- to low-elevation sites. Many of the new varieties were less fire tolerant than the ponderosa pine; this, coupled with an increase in available fuels, caused wildfires to burn more intensely and over larger areas (from the 1950s forward) (CCCD 1999).

Although there are hundreds of wildlife species (thousands when invertebrates are included) that use the wildlife habitats within the Entiat Basin for at least part of the year, there are 49 species in the priority listing for Chelan County which includes the Entiat basin. Some of the more common species known to occur, either currently or in the past, and their state of Washington status (endangered, etc.) are shown in Table 1.

Table 1. Common Wildlife Species.

Common Name	Scientific Name	Status
Big game ungulates		
Bighorn sheep	(<i>Ovis Canadensis</i>)	
Elk	(<i>Cervus elaphus</i>)	
Mule deer	(<i>Odocoileus hemionus hemionus</i>)	
Carnivores		
Fisher	(<i>Martes pennanti</i>)	
Gray wolf	(<i>Canis lupus</i>)	Endangered
Grizzly bear	(<i>Ursus arctos</i>)	Threatened
Canada Lynx	(<i>Lynx canadensis</i>)	Threatened
Marten	(<i>Martes americana</i>)	
Mammals		
Big brown bat	(<i>Eptesicus fuscus</i>)	
Bighorn sheep	(<i>Ovis canadensis</i>)	
Fringed myotis	(<i>Myotis thysanodes</i>)	
Long-eared myotis	(<i>Myotis evotis</i>)	
Long-legged myotis	(<i>Myotis volans</i>)	
Merriam's shrew	(<i>Sorex merriami</i>)	
Mink	(<i>Mustela vison</i>)	
Moose	(<i>Alces alces</i>)	

Common Name	Scientific Name	Status
Northwest white-tailed deer	(<i>Odocoileus virginianus ochrourus</i>)	
Pallid bat	(<i>Antrozous pallidus</i>)	
Pygmy rabbit	(<i>Brachylagus idahoensis</i>)	
T. big-eared bat	(<i>Plecotus townsendii</i>)	
Washington ground squirrel	(<i>Spermophilus washingtoni</i>)	
Western gray squirrel	(<i>Sciurus griseus</i>)	
Western small-footed myotis	(<i>Myotis cilolabrum</i>)	
White-tailed jack rabbit	(<i>Lepus townsendii</i>)	
Wolverine	(<i>Gulo gulo</i>)	
Yuma myotis	(<i>Myotis yummanensis</i>)	
Marine birds		
Common loon	(<i>Gavia immer</i>)	
Black-crowned night	(<i>Nycticorax nycticorax</i>)	
Great blue heron	(<i>Ardea herodias</i>)	
Waterfowl		
Harlequin	(<i>Histrionicus histrionicus</i>)	
Mallard	(<i>Anas platyrhynchos</i>)	
Hawks, Falcons, Eagles		
Peregrine falcon	(<i>Falco peregrines</i>)	
Bald eagle	(<i>Haliaeetus leucocephalus</i>)	
Osprey	(<i>Pandion haliaetus</i>)	
Prairie falcon	(<i>Falco mexicanus</i>)	
Golden eagle	(<i>Aquila chrysaetos</i>)	
Northern goshawk	(<i>Accipiter gentilis</i>)	
Swainson's hawk	(<i>Buteo swainsoni</i>)	
Upland Game Birds		
Ruffed Grouse	(<i>Bonasa umbellus</i>)	
Blue Grouse	(<i>Dendragapus obscurus</i>)	
Chukar	(<i>Alectoris chukar</i>)	
Calif. Quail	(<i>Callipepla californica</i>)	
Owls and Woodpeckers		
Northern spotted owl	(<i>Strix occidentalis</i>)	Threatened
Burrowing	(<i>Athene cunicularia</i>)	
Flammulated	(<i>Otus flammeolus</i>)	
Black-backed woodpecker	(<i>Picoides arcticus</i>)	
Pileated Dryocopus	(<i>pileatus</i>)	
Whiteheaded woodpecker	(<i>Picoides alblarvatus</i>)	
Invertebrates		
California floater	(<i>Anodonta californiensis</i>)	
Columbia pebblesnail	(<i>Fluminicola columbianus</i>)	
Giant Columbia River limpet	(<i>Fisherola nuttalli</i>)	
Amphibians		
Cascades frog	(<i>Rana cascadae</i>)	
Tailed frog	(<i>Ascaphus trui</i>)	
Columbia Spotted frog	(<i>Rana pretiosa</i>)	
Northern leopard frog	(<i>Rana pipens</i>)	
Western toad	(<i>Bufo boreas</i>)	

Common Name	Scientific Name	Status
Reptiles		
Northern sagebrush lizard	(<i>Sceloporus graciosus</i>)	
Sharptail snake	(<i>contia tenuis</i>)	
Striped whipsnake	(<i>Masticophis taeniatus</i>)	
Birds		
American white pelican	(<i>Pelecanus erythrorhynchos</i>)	
Black tern	(<i>Chlidonias niger</i>)	
Burrowing owl	(<i>Speotyto cunicularia</i>)	
Canada geese	(<i>Branta canadensis</i>)	
Cormorants	(<i>Phalacrocoracidae</i>)	
Ferruginous hawk	(<i>Buteo regalis</i>)	
Grebs	(<i>Podicipedidae</i>)	
Harlequin duck	(<i>Histrionicus histrionicus</i>)	
Lewis' woodpecker	(<i>Melanerpes lewis</i>)	
Loggerhead shrike	(<i>Lanius ludovicianus</i>)	
Marbled murrelet	(<i>Brachyramphus marmoratus</i>)	Threatened
Merlin	(<i>Falco columbarius</i>)	
Northern goshawk	(<i>Accipiter gentilis</i>)	
Olive-sided flycatcher	(<i>Contopus boreali</i>)	
Ring-necked pheasant	(<i>Phasianus colchicus</i>)	
Sage grouse	(<i>Centrocercus urophasianus</i>)	
Sage sparrow	(<i>Amphispiza belli</i>)	
Sage thrasher	(<i>Oreoscoptes montanus</i>)	
Sandhill crane	(<i>Grus canadensis</i>)	
Sharp-tailed grouse	(<i>Typanuchus phasianellus</i>)	
Terns	(<i>Laridae</i>)	
Trumpeter swan	(<i>Cygnus buccinator</i>)	
Tundara swan	(<i>Cygnus columbianus</i>)	
Vaux's swift	(<i>Chaetura vauxi</i>)	
Wild turkey	(<i>Melagris gallopavo</i>)	
Willow flycatcher	(<i>Empidonax traillii</i>)	
Yellow-billed cuckoo	(<i>Coccyzus americanus</i>)	

The Watershed Assessment (1996) provided by the USFS shows detailed information on the status of a number of wildlife species in the Entiat subbasin. Those summarized below are either endangered, threatened, at risk, or are significant game and indicator species.

Mule Deer (*Odocoileus hemionus*)

Mule deer are the most important big game animal in the Entiat subbasin. This area contains the largest herd of wintering mule deer on the Wenatchee National Forest. Most of the forest is used as summer range by deer. Winter range is in ponderosa pine, Douglas-fir, and shrub/steppe habitat series. Mule deer populations decreased initially after the 1994 Tye fire, but their numbers were expected to return to prior levels in the 10 proceeding years after the fire. Over the next 10 to 30 years, populations will likely decrease as limited water sources, human activities, and ecosystem management (winter recreation, timber harvest, livestock grazing, and fire suppression) are implemented and habitat reduced.

Beaver / Ruffed Grouse (*Castor canadensis* / *Bonasa umbellus*)

Both beaver and ruffed grouse occur in the Entiat watershed and the Tyee burn area, which provides 28,000 acres of suitable habitat. They are listed in the Wenatchee National Forest Land and Resource Management Plan as management indicator species for riparian areas. Beavers are found in rivers and streams in all successional stages of riparian habitat.

Ruffed grouse are found among deciduous trees and shrubs within the forests. They are most abundant in and near riparian habitats where they use heavy brush and thickets of young hardwood trees for cover. Disturbances (fire, timber production) within riparian and the more mesic upland forest stands maintain habitat for this species. A proper mix of conifer and hardwood edge with large woody debris on the ground is needed for breeding and winter habitat. The dense hardwood and shrub habitat favored by beaver and grouse is currently threatened by grazing, intensive fires, and roads built in or near riparian areas.

Peregrine Falcon / Bald Eagle (*Falco peregrinus* / *Haliaeetus leucocephalus*)

Peregrine falcons have been seen in the watershed and eagles are known to feed here during the winter. Peregrines nest on large rocky cliffs and feed primarily on birds in marsh, lake, river, and open upland feeding habitat. No nest sites have been found for either bird, and the number of acres of potential nesting site is unknown. There are approximately 100,000 acres of feeding habitat. Bald eagles are found in a wide variety of habitats including shrub-steppe, meadows, Douglas fir series, marshes, rivers, riparian, streams, and lakes. They need large trees for nesting (Douglas-fir, ponderosa pine, grand fir, western hemlock, and silver fir) and stands of large trees for roosting. They are known to fish the Entiat River and prefer to forage on fish and ducks, but will scavenge deer within the watershed during the winter.

3.6.2 Environmental Consequences

Alternative A - No Action

Under the No Action Alternative, the absence of preventative maintenance and bank stabilization and habitat complexity would likely result in continued erosion of the river bank. Minimal levels of sedimentation may affect aquatic species and semi-aquatic species, but upland species habitat or distribution would not be affected.

Alternatives B through F

During construction, a total of 500 feet of the main channel bank would be temporarily disturbed and have temporary effects on aquatic and semi-aquatic species distribution and habitat, in terms of sediment and turbidity. Upland species would have minimal benefit as improvements created by terraced slopes and vegetation alone would be low for the alternatives with LWD structures, habitat complexity would be added and in the long-term increase benefits for fish and wildlife. During construction, the bank disturbance would have some impacts to fish via increased temporary sediment and water turbidity and some temporary loss to existing terrestrial and semi-aquatic species habitat would occur, but over time these areas should be reestablished.

3.7 Threatened and Endangered Species

The Corps, Seattle District was notified of the proposed restoration project that falls within the range of the nine restoration activities considered by NOAA Fisheries Service and the USFWS during its Section 7 of the ESA consultation (Corps 2008). A Restoration Programmatic for the State of Washington Specific Project Information Form (Form) was completed for this project (USFWS 2010). Should the resulting impacts exceed those considered in the NOAA Fisheries Service and USFWS Biological Opinion, individual consultation will be required.

For this section, Reclamation used information from the Northwest Power Planning Council Entiat Subbasin Summary May 17, 2002, and the Programmatic Biological Assessment (PBA) which allows for No Effect, Not Likely to Adversely Affect, or Likely to Adversely Affect determinations for listed species. All currently listed evolutionarily significant units (ESUs), Interim Recovery Units (IRUs), or Distinct Population Segments (DPS) that may occur in the fifth field watershed where the project is located are considered in this document and the Form.

3.7.1 Affected Environment

Listed Fish

The Entiat subbasin currently supports anadromous runs of native Chinook and steelhead, along with non-native sockeye (Mullan et al. 1992). Coho were once present in the watershed, but have since been extirpated; passage barriers on the Entiat River at the turn of the century probably contributed to their decline (Nehlsen et al. 1991). The following are listed anadromous fish species and designated critical habitat status.

- Upper Columbia River Spring-run Chinook (*Oncorhynchus tshawytscha*) Endangered
- Upper Columbia River Steelhead (*Oncorhynchus mykiss*) Endangered
- Bull Trout (*Salvelinus confluentus*) Threatened

Designated Critical Habitat:

- Upper Columbia River Spring-run Chinook salmon - ESU
- Upper Columbia River Steelhead trout - DPS
- Bull Trout (*Salvelinus confluentus*) - DPS

Spring-run Chinook (*Oncorhynchus tshawytscha*)

There are two stocks of spring Chinook in the Entiat subbasin, the natural spawning stock, which is ESA-listed, and the hatchery stock (Entiat National Fish Hatchery) which is not listed (Carie 2001). The spring Chinook spawns and rears primarily in the mainstem Entiat between the terminal moraine (RM 16) and Fox Creek confluence (RM 28). Adults return to the Entiat in late May through July and spawn between August and September. Juveniles emerge from late March through early May, move to the lower reaches of primary tributaries and the mainstem, and begin their emigration to the sea in late fall through the following spring (peaks in late April and May)

(CCCD 1999). Spring Chinook are depressed throughout much of their current range and are in danger of extinction in many areas. The recurrent poor production has been brought about by a number of factors: Low abundance, decreasing trends in abundance, widely dispersed spawning populations, fragmented and degraded habitats, high risks of genetic introgression from hatchery fish, low frequency of wild stocks, introduced fish, harvest, and smolt and adult migration mortality in the mainstem Columbia and Snake rivers (MacDonald et al. 2000). The recent wild adult population in the Entiat River averaged 175 from 1986 to 1995 based on redd counts. The 33-year (1962 to 1995) average wild adult Entiat population averaged 437, with a high of 1,344 adults in 1964 (USFS 1996) and a low of 31 (Carie 2001) in 1995. The USFWS (2000) report an average of 386 adults returned to Entiat National Fish Hatchery between 1990 and 1999. Hatchery spawning escapement averaged about 500 fish per year over the same time period, but declined to 100 fish per year in 1994 to 1995. The combined wild and hatchery spawning escapement has averaged 675 fish per year from 1980 to 1995 (USFS 1996). Wild spring Chinook is included as an Upper Columbia ESU and was declared endangered under the ESA in March, 1999 (YN 2000).

Upper Columbia River Steelhead (*Oncorhynchus mykiss*)

Summer steelhead is native to the Entiat subbasin. They spawn and rear in the low- and mid-Entiat River, as well as Brennegan, Mud, Potato, Preston, Roaring, and Stormy creeks from mid-March to the end of May (Figure 4) (CCCD 1999). The Mad River has been the primary producer of steelhead (MacDonald et al. 2000). Steelhead usually remain in the Entiat River or its tributaries for 1 to 2 years, and most spend about 2 years (females may stay longer) at sea. Hatchery smolts are planted into the mainstem Entiat between April 20 and May 20 and 10 percent probably remain in the system for another year before migrating to the ocean (CCCD 1999).

Historically, steelhead have experienced only moderate production in the Entiat watershed (Mullan et al. 1992). The construction of dams near the mouth of the Entiat River at the turn of the century blocked salmon from their spawning habitat and dramatically reduced their numbers by the 1930s (unidentified). Annual counts at the Rock Island Dam, beginning in 1933, show their numbers are rebounding. Peven (1992) and Mullan et al. (1992) attribute the increase to enhanced ocean survival and the supplementation of hatchery stock. Hatchery fish spawning in the Columbia River Basin have outnumbered wild steelhead for the last twenty years. Seventy-three percent of the steelhead entering the Columbia River in 1987 was of hatchery origin (Andonaegui 1999). Summer steelhead is listed as depressed by SASSI (1992) and was listed as endangered under the ESA in August, 1997 (YN 2000). Past and proposed efforts may provide additional spawning habitat. Recently, improvements were made to a partial passage barrier near the mouth of the Mad River to open habitat to steelhead. In addition, further investigation may reveal that a section of the Roaring watershed, currently used by Redband trout, could be made accessible to steelhead (MacDonald et al. 2000).

Bull Trout (*Salvelinus confluentus*) Threatened

Some bull trout have been observed in the mainstem below Entiat Falls; however, they spawn and rear in the middle and upper Mad and the upper Entiat rivers (MacDonald et al. 2000). Since 1989, annual bull trout spawning surveys have been conducted in a 7.5-mile-long index reach on the Mad River, which runs from the mouth of Young to the mouth of Jimmy Creek (Archibald 2001). The Mad River supports the largest populations of bull trout, but their numbers may be dwindling. Only 16 redds were recorded in the Mad River index reach during 1995. The size and status of the upper-mid Entiat population is unknown (MacDonald et al. 2000). Bull trout from both areas were listed as threatened under the ESA in June 1998 (YN 2000) and in the Entiat River are within critical habitat designation (USFWS 2010).

Other fish species that are ESA Species of Concern include the Pacific, River, and Western Brook Lamprey, Pygmy whitefish, Redband trout, and Westslope cutthroat.

Listed Terrestrial Species

Listed terrestrial species that many occur within Chelan County are the only ones considered in this EA. Please refer to the PBA for actions that may affect these species and conservation measures to protect terrestrial species. For additional information on the listed terrestrial and aquatic species that occur in Washington, visit the following website: ecos.fws.gov or contact the local USFWS field office.

Gray Wolf (*Canis lupus*) – Endangered

The range of the grey wolf includes the Blue Mountains, northeast Washington (Rocky Mountains), and the Cascade Mountains. There are no confirmed records of wolves west of the Cascade Crest and no documented den sites in the state.

Grizzly Bear (*Ursus arctus horribillis*) – Threatened

The grizzly bear recovery plan identifies high alpine areas in the North Cascades (north of Interstate 90 to the Canadian border) as important for recovery of this species in Washington.

Canada lynx (*Lynx Canadensis*) – Threatened

Sightings of lynx have been documented in the Entiat region. This species occurs in high elevation forests (generally above 4,000 feet) in the North Cascades and northeast Washington. Lynx populations are low throughout its range in Washington and are likely to drop even lower in future. It is listed as threatened by the State of Washington and a species of concern by the USFWS.

Northern Spotted Owl (*Strix occidentalis*) - Threatened

Spotted owls have been known to exist in the Entiat watershed since 1986 when the first inventories were completed. Grand fir, western hemlock, silver fir, and high site indexes of Douglas fir series comprise spotted owl habitat. Logging and fires have destroyed or damaged spotted owl habitat. The trend is for habitat and populations to decrease over the next 40 to 60 years and possibly stabilize after that.

Other ESA-listed species that are Candidates for Protection include the Bald eagle, Fisher, and the Yellow-billed cuckoo. ESA-listed wildlife Species of Concern include Black swift, California floater, Columbian sharp-tailed grouse, Ferruginous hawk, Giant Columbia spire snail, Kincaid meadow vole, Loggerhead shrike, Long-eared myotis, Northern goshawk, Olive-sided flycatcher, Pallid Townsend's eared bat, Perigrine falcon, Sagebrush lizard, Sharptail snake, and the Western gray squirrel (USFWS 2008).

Listed Plants

No herbicide use, mechanical vegetation management, or construction activities are permitted in areas that could support listed plants.

Hackelia venusta (showy stickseed) – Endangered

This species occurs in Chelan County, between 984 and 1,600 feet in elevation, in the ponderosa pine zone. The showy stickseed is the rarest plant in Washington, currently known to occur in only one location in the Wenatchee Mountains within the Tumwater Canyon area of Chelan County. The project site is not located in the Wenatchee River basin and is at approximately 1,620 feet in elevation, thus outside of the anticipated range of showy stickseed.

Spiranthes diluvialis (Ute ladies'-tresses) – Threatened

This plant grows on the margins of springs, wet meadows, floodplains, and riparian areas in Okanagon and Grant County and from three locations adjacent to the Columbia River in extreme eastern Chelan County. This species occurs in a variety of soil types and in the western most portion of its range, may be found at elevations ranging from 700 feet to 4,000 feet. In Washington, the orchid is known from a periodically flooded alkaline flat/moist meadow adjacent to ponderosa pine/Douglas-fir woodlands and sagebrush steppe in Okanagon County, and from three locations adjacent to the Columbia River in extreme eastern Chelan County. Ute ladies'-tresses is not expected to occur at the project site due to the lack of suitable habitat.

Other Species of Concern that are known to occur within the vicinity of the study area are Wenatchee Larkspur (*Delphinium viridescens*) and Thompson's clover (*Trifolium thompsonii*) (WDNR 2009), Whited's milk-vetch (*Astragalus sinuatus*), Chelan rockmat (*Petrophyton cinerascens*), Two-spiked moonwort (*Botrychium paradoxum*), Whitebark pine (*Pinus albicaulis*), Clustered lady's slipper (*Cypripedium fasciculatum*), and Seely's silene (*Silene seelyi*) (USFWS 2008).

3.7.2 Environmental Consequences

Fish

Alternative A - No Action Alternative

Under the No Action Alternative, the project would not proceed and would not affect listed fish species; therefore, species would continue to exist at the project area in its current state. Long-term erosion of the area may increase sediment load into the stream and may eventually have an effect on spawning habitat selection and availability.

Alternatives B through F

Suitable habitat for all three species protected under ESA occurs at the project site. Spawning, rearing, and migration of spring and summer Chinook salmon and steelhead is documented in the Entiat River, steelhead spawn within the action area of the project reach. The substrate is considered excellent for salmon and steelhead between RM 21.1 and RM 22.6, and nine Chinook salmon redds were observed in this section of the river (USFS 2009). This project is recommended under the 2008 Federal Columbia River Power System Biological Opinion (NOAA Fisheries 2008) which provides scientific information to Federal, Tribal, State, and local partners for identifying, prioritizing, and implementing sustainable field projects that improve survival and lead to the recovery of salmon and steelhead listed under the ESA. In response to the Corps 2008 Fish Passage and Restoration Programmatic, NOAA Fisheries considers this project to be Likely to Adversely Affect Upper Columbia River (UCR) steelhead and UCR spring-run Chinook salmon with an associated extent of take of the handling of up to 35 juveniles of each species associated with the incremental isolation (eight increments) of a total of approximately 28,000 square feet of the bed of the Entiat River. NOAA Fisheries does not expect take in the form of turbidity because it anticipates that a portadam will be installed and removed in such a manner as to cause only minor, short term turbidity plumes and because in-water work will not continue if UCR spring-run Chinook salmon redds are located near enough to the action that they are likely to be involved by a turbidity plume (Corps 2008; NOAA Fisheries 2008; Reclamation 2009b).

Bull trout are known to spawn further upstream in the Wenatchee subbasin, and adult bull trout are known to migrate within the Entiat River, between tributaries of the Entiat River and the Columbia River. USFWS agreed this work May Affect and is Not Likely to Adversely Affect bull trout (*Salvelinus confluentus*), and that this project will not destroy nor adversely modify proposed critical habitat for the bull trout. To avoid adverse effects, USFWS recommended that in-water work after September 15th be constrained to the period that begins an hour after sunrise and ends an hour before sunset. This measure would allow bull trout to have the entire twilight and nighttime periods for undisturbed migration and will also provide an opportunity for sediment pulses generated by construction to settle and dissipate before nighttime movements of bull trout begin (USFWS 2010).

Terrestrial Species:**Alternative A - No Action Alternative**

Under a No Action Alternative, a no effect designation would occur as the project would not proceed; therefore, species would continue to exist at the project area in its current state.

Alternatives B through F

Although suitable habitat for the first three species may occur within the project area, these species for Action Alternatives B through F should have a no effect designation as these species are not expected to occur within the project action area. For the northern spotted owl, the project does not occur within 200 feet of suitable habitat (mature conifer forest over 80 years old); therefore, this species would also have a no effect designation.

Plant Species:**Alternative A - No Action Alternative**

Under a No Action Alternative, a no effect designation would occur as the project would not proceed; therefore, species would continue to exist at the project area in its current state.

Alternatives B through F

These two species protected under ESA for Action Alternatives B through F would have a no effect designation as a botanical survey of the site was completed in September 2009 and no plants similar to any of the target species were found in or adjacent to the action area. No potentially suitable habitat for any of the target species was observed in the lower or upper survey areas; the absence of suitable habitat conditions is primarily the result of human and domestic animal disturbance. All of the wetland, riparian, and upland habitats in the study area are heavily grazed by domestic animals (i.e., horses and donkeys) to the point that the only remaining vegetation in these areas are species tolerant of repeated trampling and browse, or are of a stature or composition that resists browse damage (e.g., thorny hawthorn, unpalatable horsetail, tall trees, and shrubs) (ICF Jones & Stokes 2009b).

3.8 Cultural Resources and Sacred Sites

3.8.1 Affected Environment

Section 106 of the National Historic Preservation Act (NHPA) requires that Federal agencies take into account the effects their actions may have on historic properties. Historic properties are cultural resources that have been determined eligible for, or are listed on, the National Register of Historic Places. 36 CR Part 800, the implementing regulations for Section 106, defines procedures that Federal agencies must follow to comply with Section 106. The procedures

include determining if historic properties are present, assessing potential project effect on those properties, and addressing adverse effects that may occur to historic properties. These determinations are made by the responsible Federal agency, in consultation with the State Historic Preservation Officer (SHPO) and Indian tribes with a traditional religious and cultural interest in the study area.

As part of project planning efforts, Reclamation contracted with ICF Jones & Stokes to conduct background research and an archeological survey of the area of potential effect (APE) for the Preston Reach Project. The APE included the project implementation area, a buffer area, access roads, and staging areas. The results of this survey are presented in a cultural resources survey report (ICF Jones & Stokes 2009c) on file with Reclamation and the Washington SHPO. It should be noted that ICF Jones & Stokes surveyed a larger area encompassing several potential projects at the Preston Reach location. Only a portion of the survey area lying between RM 21.4 and RM 21.6 is affected by the action addressed in this EA.

In September 2009, in advance of field work, ICF Jones & Stokes sent letters to the SHPO, the Yakama Tribe, and the Colville Confederated Tribes that informed them of the proposed project and delineated a study area that encompassed the APE for this and other projects on the Preston Reach. The tribal notifications requested that the tribes provide information on known resources of traditional religious and cultural importance to the tribes (hereafter called traditional cultural properties, or TCPs). In a letter dated September 29, 2009, the SHPO concurred with APE. In a letter dated November 20, 2009 the Colville indicated that the tribes had used the lands within the study area, but provided no specific indication of whether specific resources were known to the Colville Tribes. They indicated that ICF Jones & Stokes should complete research to identify known resources, and asked to review the draft historic overview when it was completed. No response was received from the Yakama Indian Nation.

On September 30, 2009, ICF Jones & Stokes conducted a literature and records search at the Department of Archaeology and Historic Preservation in Olympia. This search included a review of all available cultural resource reports and site records related to the survey area and a larger contextual study area extending to all lands within a 1-mile radius of the survey area. The research showed that no cultural resources of any type (including TCPs) have been previously recorded in the survey area or within a 1-mile radius. On October 12 and 13, 2009, ICF Jones and Stokes completed archeological field investigations within the APE. They completed an intensive (10-meter interval) pedestrian survey of potentially impacted areas, including the access and staging areas. Visibility was good to excellent. They also completed shovel testing (50-cm diameter probes at 20-meter interval) along the bank area where the deep construction impacts will occur, with shovel scrapes in areas of lesser disturbance. No cultural materials were found (ICF Jones & Stokes 2009c). Subsequently, per the Colville Tribes' request, ICF Jones & Stokes provided them with the draft cultural overview, the Colville provided comments, and ICF Jones & Stokes revised and expanded their draft to address those comments. The revised context statement was again provided to the Colville for review, but no further comments were received. ICF Jones & Stokes therefore finalized the report and provided it to Reclamation.

After review of materials provided by ICF Jones & Stokes, Reclamation determined that the proposed action would have no effect on historic properties. Reclamation also assessed that there was little potential for undetected buried cultural materials, based upon the results of testing and the depositional characteristics of soils at the location. On June 3, 2010, Reclamation provided a copy of the survey report to the SHPO and requested their concurrence with agency findings of “no effect.” On June 7, 2010, the SHPO provided a concurrence with that finding (see Appendix C).

3.8.2 Environmental Consequences

Alternative A - No Action

There would be no effect to historic properties under Alternative A, since no Federal actions would occur.

Alternatives B through F

There would be no effect to historic properties under Alternatives B through F. No cultural resources were identified during the background research or archeological survey, and Reclamation and the SHPO have reached agreement that the proposed project will have no effect upon historic properties.

3.9 Indian Sacred Sites

3.9.1 Affected Environment

Federal responsibility for Indian sacred sites is defined in Executive Order (EO) 13007. Indian sacred sites are defined as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian Tribe, or an Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion...”

Under EO 13007, Federal land managing agencies must accommodate access to and ceremonial use of Indian sacred sites on Federal lands by Indian religious practitioners, and seek to avoid adversely affecting the physical integrity of those sacred sites. Since the proposed action is on privately owned, not Federal lands, EO 13007 does not apply. Regardless, there are no known Indian sacred sites in or within a mile of the project area.

3.9.2 Environmental Consequences

Alternative A – No Action

There would be no effect to Indian sacred sites under Alternative A because EO 13007 doesn't apply to non-Federal lands, because no Federal action would occur, and because no Indian sacred sites were identified in or near the project area.

Alternatives B through F

There would be no effect to Indian sacred sites for Alternatives B through F because EO 13007 doesn't apply to non-Federal lands, and also because no Indian sacred sites were identified in or near the project area.

3.10 Indian Trust Assets

3.10.1 Affected Environment

ITAs are legal interests in property held in trust by the United States for Indian Tribes or individuals. The Secretary, acting as the trustee, holds many assets in trust for Indian Tribes or Indian individuals. Examples of ITAs are lands, minerals, and hunting, fishing, and water rights. While most ITAs are on-Reservation, trust assets may also be off-Reservation. The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or Indian individuals by treaties, statutes, and executive orders. These are sometimes further interpreted through court decisions and regulations. There are no known ITAs within the study area.

3.10.2 Environmental Consequences

Alternative A - No Action

Under the No Action Alternative, a no effect designation would occur as the project would not proceed; therefore, no cultural resources would be disturbed other than through natural, continued erosion processes. The project area would continue to remain in its current state. The No Action Alternative will have no effect on ITAs since no known ITAs have been identified in the project area. This includes effects associated with both construction and long-term impacts. Reclamation received concurrence from the SHPO that there would be no effect (Appendix A). Reclamation would continue to consult with SHPO for Federal undertakings if the No Action Alternative is chosen and would work with the tribes and SHPO to mitigate any adverse effects from those undertakings.

Alternatives B through F

Although no known archeological sites have been recorded within 1 mile of the survey area and no cultural resources were identified during the survey, for Action Alternatives B through F, there is currently a no effect designation (Appendix A). Should any cultural resources be discovered, all activities would cease and a Cultural Resource Specialist would be contacted to confirm and/or allow further actions. Under Alternatives B through F, there would be no impacts on ITAs since no known ITAs have been identified in the project area.

3.11 Socioeconomics

3.11.1 Affected Environment

The Presidential EO 12898 (1994) mandates Federal agencies to identify and address any impact the action would have on environmental justice with regard to human health as well as social and economic issues. The Preston Reach area has a diverse geographical terrain that provides opportunity for agricultural production and recreation. This section describes and analyzes the general features of the population, including the minority population, and employment that could be affected by the proposed action.

Population

The Census Bureau does not have specific information for the Preston Reach Area; therefore, the following information is for Chelan County and the nearest town of Ardenvoir. The population in Chelan County in 2008 was 71,540; and the town of Ardenvoir had a population of 44 based on 2000 census sample data (Census 2008). The density information is based on 109.3 people per square land mile for the Ardenvoir area.

Income and Employment

Median household income (MHI) and per capita income for Chelan County and Ardenvoir are 37,316 and \$51,250 respectively (income in 1999 for Chelan County and 2000 for Ardenvoir). Although the unemployment is at 0 percent for Ardenvoir, the poverty levels (23.7 percent) are above those compared to levels in the state of Washington which are at 11.3 percent poverty levels. Washington State has a low unemployment rate at 4.1 percent.

The distribution of employment by industry within the Chelan County service sector includes production and transportation (25 percent) as the highest percentage of professionals followed by sales, services, construction, and farming, accounting for 10 percent of the total employment.

Environmental Justice

Environmental justice analysis examines disproportionately high or adverse impacts to minority and low-income populations resulting from the implementation of the proposed action. These populations are:

- Minority populations: persons of Hispanic or Latino, African-American, American-Indian and Alaska Native, Asian, Pacific Islander origins.
- Low-income populations: persons living below the poverty level, based on a weighted-average total-annual income of \$8,501 for a single person.

Information contained in the 2000 Census of Population was used to identify these populations. The 2000 Census does set apart individuals identified as Hispanic or Latino heritage from the rest of the categories for Ardenvoir. The 2000 Census data for the white racial category comprises the highest percent for Ardenvoir, Chelan County, and Washington (Census 2008).

U. S. Census Bureau 2000 Statistics	Ardenvoir	Chelan	Washington State
Total Population, 2000 estimate	44	71,540	6,549,224
White	90.9	95.5	84.3
Hispanic or Latino	6.8	23.1	9.8
American Indian or Alaska Native	2	1.3	1.7
Asian	0	0.9	6.7
Black or African American	0	0.7	3.7
Native Hawaiian or Pacific Islander	0	0.2	0.5
Other Races	0	73.6	75.5
Persons below poverty	23.7	12.0	11.3

3.11.2 Environmental Consequences

Alternative A - No Action

The No Action Alternative would not cause disproportionately adverse social, economic, or human health impacts to local minority or low-income populations.

Alternatives B through F

The Action Alternatives would not cause disproportionately adverse social, economic, or human health impacts to local minority or low-income populations.

3.12 Environmental Commitments

The following environmental commitments would be followed to avoid or minimize potential effects that could occur if any of the action alternatives were implemented.

- Following structure placement, restore vegetation to produce a suitable vegetative cover, provide protection to soils and the adjacent stream, and provide wildlife habitat.
- Temporarily fence off the area until the vegetation has been established.
- As much as possible, perform bank stabilization and construction during dry periods and when flow is low in the channel.
- Restrict the use of the access road to dry periods and only to those performing the construction and oversight.

- Use BMPs to minimize environmental consequences caused by stabilizing activities and construction.
- Take standard and reasonable precautions to reduce erosion and limit sediment runoff from the construction site.
- At standard engineering sites, stockpile or deposit excavated materials away from streambanks, wetlands, or other watercourse perimeters where they could be washed away by storm events.
- Implement final erosion control and site restoration measures, such as restoring original contours, and blocking unnecessary construction access roads, and reseeded areas of construction, including culvert installation sites to prevent future erosion.
- Obtain and follow all conditions of the appropriate Corps permits.
- During construction, take appropriate measures to prevent the entrance of accidental spillage of contaminants or other objectionable pollutants into the surface water.
- Remove heavy equipment and machinery from the river area prior to refueling, repair, and maintenance. Heavy equipment use in the river channel would be kept to a minimum, and within the areas specified in applicable Federal permits.
- Avoid wetlands during the construction process where possible.
- Follow the appropriate requirements and obtain all permits required for construction in or near a wetlands area to comply with the CWA.
- Arrange clearing operations and standard engineering structures to preserve and protect all trees, shrubs, and current vegetation to the maximum practicable extent.
- Implement site specific erosion control to avoid degradation of downstream fish habitat caused by release of sediment or increased turbidity.
- Coordinate with USFWS and the Tribes to preserve and protect species and ensure potential impacts are either avoided or minimized.
- During the 3 years following project completion, Reclamation recommends joint monitoring and evaluation of the project's performance. This would be accomplished semi-annually, first in the spring and second after irrigation season ends. In the years following this initial 3-year period, monitoring would take place annually. If problems are identified, necessary repairs would be completed to prevent potential failure of the project.

In addition to the above general environmental commitments, the following specific commitments would apply:

Cultural Resources

- If cultural deposits or human remains are encountered during construction, all ground disturbing actions will immediately cease in the vicinity of the discovery. Reclamation will then assess the discovery and implement the requirements, as needed, of either Section 106 of the National Historic Preservation Act or Washington State burial laws. Ground disturbing actions in the vicinity of the find will resume only after written authorization is provided by Reclamation's Contracting Officer.
- The cultural resources clearance is provided only for the areas investigated by ICF Jones & Stokes and included in consultations with the SHPO and tribes to assess project effect. If Reclamation or their partners or contractors identify any additional locations outside of the "cleared" area, then prior to approval for use of those areas, a Reclamation archeologist shall determine if additional survey or consultation is needed in order to comply with Section 106 of NHPA. If additional survey or consultation is needed, it shall be completed prior to any use of the land for project purposes. The further actions shall use methods consistent with requirements defined in 36 CFR 800.
- The commitments outlined above shall be defined as requirements in the construction contract and in any associated agreements with partnering entities. These requirements shall be discussed with partners and contractors during pre-work meetings to ensure they are understood and that notification processes are defined to use in the events defined.

Geology/Soils

- Protect areas of high traffic volume by placement of temporary road fill particularly if construction occurs during winter months; fill would be removed upon project completion.
- Reduce amount of staging area by using off-site areas, if possible.
- Construct temporary work pads and parking areas to help prevent short-term damage of local soils.

Vegetation

Use only live cuttings and suitable local native vegetative species for bioengineering techniques that would provide quality habitat and forage for wildlife.

Fish and Wildlife

Revegetate streambanks and other disturbed areas with native species that would provide habitat and forage for fish and wildlife.

3.13 Cumulative Effects

A cumulative effect results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative effects were not analyzed in this EA because the habitat restoration projects being conducted in this watershed are covered in the Bonneville Power Administration (BPA) Fish and Wildlife Implementation Plan EIS of April 2003 (BPA 2003). The programmatic EIS considers both the broad-based actions (e.g. policy and programs) and the site specific actions for habitat restoration. All reasonably foreseeable future habitat projects conducted in the watershed will be conducted under procedures outlined in the BPA EIS.

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Chapter 4 Consultation and Coordination

ICF Jones & Stokes prepared a memorandum at the request of Reclamation to summarize how public involvement has been a part of this project's planning process. This memo describes the project's relationship to the Detailed Implementation Plan: The Entiat Water Resource Inventory Area 46 Management Plan, February 2006 (Implementation Plan). This Implementation Plan was required to be administered through an open, public process. The CCD has been the lead public jurisdiction to ensure the process has been followed (Appendix B).

4.1 CONSULTING AGENCIES AND PUBLIC INVOLVEMENT

The identification, prioritization, and design of the Preston Reach Yurt Site Riparian Restoration Project have been accomplished within the framework of the Implementation Plan as administered by the EWPU. A critical component to this EWPU planning process is public involvement. The participants in the EWPU are made up of a diverse group of stakeholders representing a wide range of interests including local governments and districts, citizens, tribes, State and Federal agencies, irrigation, agriculture, forestry, community groups, conservation groups, economic development, and recreation. Development of the plan was done through a voluntary, collaborative process supported through the 1998 Watershed Management Act (RCW 90.82) which provided the framework and funding for locally-based planning of water resource related issues (the EWPU).

The Entiat HSC oversees the Implementation Plan as part of the EWPU and has been active in identifying priority actions to protect and enhance habitat of threatened and endangered species throughout the watershed, improving overall habitat function and connectivity. As an extension of the HSC, an Interdisciplinary Team (IDT) has been developed to analyze project alternatives and guide the project through completion. Since the yurt site project was selected for an alternatives analysis by the HSC, CCD has conducted landowner outreach to affected and adjacent landowners in the project reach. This effort has included the following meetings to date:

- A letter was sent by CCD to all landowners in the Preston Reach on July 18, 2009 inviting participation in an informational meeting (Appendix B).
- A site visit to the yurt site on September 17, 2009, with the IDT to meet the primary landowners.
- Meeting on November 16, 2009 in SeaTac, WA with CCD and the Entiat Riverbend Board to discuss landowner views from the south side of the river across from the yurt site.

- HSC meeting on November 19, 2009 at the Entiat Fire Hall to present the five project alternatives.
- Meeting on December 7, 2009 with CCD and the primary yurt site landowner in Monroe, WA.
- Phone meeting on December 8, 2009 with CCD and the adjacent yurt site landowner.

Additional phone and email correspondence has continued with landowners and stakeholders throughout the yurt site alternatives analysis.

In January 2010, CCD worked closely with the IDT and Reclamation to select a preferred alternative and complete design plans. These design plans and permits were submitted to the following resource agencies:

- Chelan County Planning Department: Local Critical Areas Ordinance and SEPA Review
- The WDOE: Section 401 Water Quality Certification
- The Corps, Seattle District: Section 404 Permit
- The WDFW: Hydraulic Project Approval
- The USFWS and NOAA Fisheries Service: Section 7 ESA Consultation

All of these permits are processed under an open public process. Depending on the type of permit issued, and the level of directly solicited public input, the requirements for public notices can vary. However, none of these local, State, and Federal agencies should deny public requests for project information during the permit process.

On behalf of Reclamation, ICF Jones & Stokes also formally invited comments from the Yakima Nation, Coleville Confederated Tribes and the Washington State Department of Archeology and Historic Preservation (DAHP) under Section 106 of the national Historic preservation Act of 1966 (NHPA), implementing regulations (36 CFR 800) (Appendix A).

4.2 NATIONAL HISTORIC PRESERVATION ACT OF 1966

Section 106 of the NHPA, as amended, requires that Federal agencies identify historic properties that may be affected by their actions, and take into account the effects the actions may have on historic properties. Implementing regulations (36 CR Part 800) requires Federal agencies to make determinations in consultation with the SHPO and Indian tribes with a traditional religious or cultural interest in the study area. Reclamation or their contractor completed notifications and consultations as discussed in Section 3.8.1. No responses were received from the Yakama

Nation. The Colville Confederated Tribes provided input and assistance with preparation of the contractor's environmental context statement. Although they indicated that the area was used by Indian peoples in the past, they provided no information about specific resources within or near the area of potential effect/study area. The SHPO concurred with the proposed area of potential effect (presented by Reclamation's contractor as the study area) and later concurred with Reclamation's assessment that the proposed action would have "no effect on historic properties" (Appendix C).

4.3 ENDANGERED SPECIES ACT (1973) SECTION 7 CONSULTATION

The Endangered Species Act (ESA) requires all Federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. The evaluation of endangered species contained in this EA serves as Reclamation's biological assessment as required under the ESA. It evaluates impacts on listed and candidate species, including the Gray Wolf (*Canis lupus*) – Endangered, Grizzly Bear (*Ursus arctus horribillus*) – Threatened, Canada lynx (*Lynx Canadensis*) – Threatened, Northern Spotted Owl (*Strix occidentalis*) – Threatened, *Hackelia venusta* (showy stickseed) – Endangered, *Spiranthes diluvialis* (Ute ladies'-tresses) – Threatened. The FWS does not expect effects to these listed species and their habitats to occur (Appendix C).

There are three ESA-listed anadromous fish known to occur within the study area; and the FWS concurred with the CCD on the findings that the Upper Columbia River Spring-run Chinook (*Oncorhynchus tshawytscha*) and the Upper Columbia River Steelhead (*Oncorhynchus mykiss*) would all have a May Affect but Not Likely to Adversely Affect determination. FWS also agreed that the Bull Trout (*Salvalinus confluentus*) would have a Likely to Adversely Affect determination, therefore FWS has prescribed in-water work after 15 September be constrained to the period that begins an hour after sunrise and ends an hour before sunset. This measure would allow bull trout to have the entire twilight and nighttime periods for undisturbed migration and will also provide an opportunity for sediment pulses generated by construction to settle and dissipate before nighttime movements of bull trout begin. FWS agreed the project will not destroy or adversely modify proposed critical habitat for the bull trout (Appendix C).

4.4 TRIBAL COORDINATION AND CONSULTATION

Reclamation or their contractor completed notifications and consultations with the Colville Confederated Tribes and the Yakama Indian Nation, as discussed in Section 3.8.1. No responses were received from the Yakama Indian Nation. The Colville Confederated Tribes provided input and assistance with preparation of the contractor's environmental context statement.

4.4.1 INDIAN SACRED SITES (EXECUTIVE ORDER 13007)

Indian sacred sites are defined as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian Tribe, or an Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion...” Because the project will occur on privately-owned lands, EO 13007 doesn’t apply.

4.4.2 INDIAN TRUST ASSETS (ITAs)

None of the proposed stabilization alternatives would occur on Tribal lands and could impact Tribal resources and/or Indian Trust Assets. See Section 3.8.1 for a discussion regarding ITAs.

4.4.3 OTHER LAWS AND REGULATIONS

The relationship between Federal agencies and sovereign Tribes is defined by laws, regulations, and Executive Orders addressing the requirement of Federal agencies to notify or consult with Native American groups or otherwise consider their interests when planning and implementing Federal undertakings.

Chapter 5 Literature Cited

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Appendix A



IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF RECLAMATION
Pacific Northwest Region
1150 North Curtis Road, Suite 100
Boise, Idaho 83706-1234



PN-3914
ENV-1.00

JUN - 3 2010

Dr. Robert Whitlam
State Archaeologist
Washington State Department of Archaeology and Historic Preservation
1063 South Capitol Way, Suite 106
Olympia, WA 98501

Subject: Survey and Findings for the Preston Reach Salmonid Habitat Restoration Project,
Yurt Property Element, Entiat River, Chelan County, Washington
(DAHP Log No. 092809-05-BOR)

Dear Dr. Whitlam:

The Bureau of Reclamation proposes to implement the actions described below to improve fish habitat conditions at a location on the Entiat River, shown on figure 1, and hereafter called the Yurt Property. As part of project planning efforts, Reclamation contracted with ICF International (formerly ICF Jones & Stokes) to complete background research and an archeological survey of the potential area of effect. As indicated in the enclosed report, no cultural resources were identified as a result of the investigations. With this letter we describe the proposed undertaking and request your concurrence that the proposed action at the Yurt Property will have "no effect" upon historic properties.

Please note that the report also discusses survey results at two potential fish habitat improvement locations that are not part of this consultation. The first location is continuous to the Yurt Property, and is identified as Stabilization Area 2 on figure 1. The second, called the lower Preston levee site, is further upstream. We are not consulting at this time on potential activities at these two locations because the nature and extent of those activities are insufficiently defined. Restoration programs may be proposed in either location in 2012 or later, in which case they would be considered separate undertakings for which Section 106 consultations will be completed by Reclamation or possibly a different lead agency.

At the Yurt Property, Reclamation proposes to restore habitat conditions along a 650-foot-long stretch of the Entiat River in Section 3, T. 27 N., R. 19 E., extending from about RM 21.4 to 21.5. The bank is eroding at this location, putting sediments into the stream (figure 2). Grazing has reduced surface vegetation that would otherwise have helped to stabilize soils. All trees have been removed from the bank, which allows the water temperature to become unsuitably warm for fish in summer months. Reclamation will stabilize the eroding bank using log

structures, and plant trees and other vegetation to shade the water and provide additional habitat improvement. Accomplishing these actions will require excavation that will extend 40 to 50 feet back from the existing bank edge along most of the 650-foot-long project area (figure 3). The excavation will be up to 10 feet in depth along the stream margin and then reduce to 1 to 3 feet in depth toward the rear of the cut area. This will create a sloped bank that is more stable and natural. Logs will be placed along the stream margin within the cut and then buried in fill, so that they extend from the new bank into the stream channel. A row of willows will be planted near the back edge of the cut. The cut area will be covered with biodegradable matting and planted with grasses. Beyond the willows, in an area identified on figure 3 as the floodplain area, compost will be worked into the top 6-inches of native soil and then the area will be planted with native tree species and seeded with a native grass mixture. Access to the work area will be on an existing graded and graveled private road, and the staging area will be in the pasture between the access road and the river bank, as shown on figure 4. No power or water lines will be installed. Fill needed will be obtained from soils excavated from the cut.

In September 2009, Jones & Stokes provided you with information about the planned investigations. In a letter dated September 29, 2009, you responded with concurrence to the area of potential effect (APE). We ask that you review the project description provided above and figures 1 and 3 and agree that the area surveyed encompasses the APE.

The enclosed archeological survey report details the compliance activities completed and the results. Briefly, these were:

- tribal notifications and requests to provide information on resources of traditional religious and cultural importance to the tribes (see enclosed letters)
- notification of the Department of Archaeology and Historic Preservation (DAHP) of the proposed project, followed by a files search at DAHP
- an intensive (10-meter interval) archeological survey of the area to be affected by construction, vegetative treatments, and staging
- shovel testing (50-cm diameter probes at 20-meter interval) along the bank area where the deep construction impacts will occur, with shovel scrapes in areas of lesser disturbance

No previously recorded properties were identified during the DAHP files search. The Yakama Indian Nation did not respond to the request for information. The Colville Confederated Tribes (CCT) indicated that the tribes used the area, but identified no specific properties. Per the CCT's request, Jones & Stokes provided the Tribes with their draft cultural overview, and Jones & Stokes subsequently revised and expanded that draft to address the CCT's comments. The revised draft was forwarded to the CCT for review and comment. No further comment was received from the CCT. The CCT's letters are enclosed for your information. The field investigations were completed in October 2009. No sites or cultural materials were identified during survey or testing activities. Visibility was good to excellent.

Reclamation has reviewed the information provided, and assessed that there is little potential for undetected subsurface deposits within the area of potential effect. Shovel tests were typically excavated to 100 cm below surface and augering occurred in most units to depths greater than 200 cm below surface. The tests confirm there is very little potential for buried deposits. We

interpret the stratigraphy described in the report to be typical of locations where the river has migrated across the landscape, depositing and scouring and then redepositing materials over time. If this area had been used in the past this natural process would appear to have washed away the evidence of that use. Reclamation does not propose to have an archeologist monitor excavations, but will include in our construction contract a requirement that all work must immediately halt if any potential cultural materials or human remains are noted.

We ask that you concur that there is "no effect" to historic properties from the proposed actions at the Yurt Property.

If you have any questions, please contact Ms. Lynne MacDonald, Regional Archeologist, at 208-378-5316. Thank you for your assistance with this project.

Sincerely,



Rik Arndt
Program Manager, Land Resources

Attachments - 8

cc: John M. Soden, ICF, 1108 11th Street Suite 301, Bellingham, WA 98225
(w/encls, via electronic mail)



STATE OF WASHINGTON

DEPARTMENT OF ARCHAEOLOGY & HISTORIC PRESERVATION

1063 S. Capitol Way, Suite 106 • Olympia, Washington 98501
Mailing address: PO Box 48343 • Olympia, Washington 98504-8343
(360) 586-3065 • Fax Number (360) 586-3067 • Website: www.dahp.wa.gov

June 7, 2010

Mr. Rik Arndt
Bureau of Reclamation
1150 north Curtis Road, Suite 100
Boise, Idaho 83706-1234

Re: Preston Reach Salmonid Habitat Restoration Project
Log No.: 092809-05-BOR

Dear Mr. Arndt:

Thank you for contacting our department. We have reviewed the professional archaeological survey report for the proposed Preston Reach Salmonid Habitat Restoration Project on the Yurt Property along the Entiat River, Chelan, County, Washington.

We concur with your determination of No Historic Properties Affected.

We would appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

In the event that archaeological or historic materials are discovered during project activities, work in the immediate vicinity must stop, the area secured, and this office notified.

These comments are based on the information available at the time of this review and on the behalf of the State Historic Preservation Officer in conformance with Section 106 of the National Historic Preservation Act and its implementing regulations 36CFR800. Should additional information become available, our assessment may be revised.

Thank you for the opportunity to comment and a copy of these comments should be included in subsequent environmental documents.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 586-3080
email: rob.whitlam@dahp.wa.gov

Appendix B

Memorandum

Date: December 9, 2009

To: Gretchen Fitzgerald, US Bureau of Reclamation

cc: Mike Knutson, US Bureau of Reclamation

From: John M. Soden

Subject: **Preston Reach, Entiat River, WA – Yurt Site Riparian Restoration Project - Public Involvement Summary**

ICF Jones & Stokes has prepared this memorandum at the request of the US Bureau of Reclamation (Reclamation) to summarize how public involvement has been a part of this project's planning process. This memo describes the project's relationship to the Detailed Implementation Plan: The Entiat Water Resource Inventory Area 46 Management Plan, February 2006 (Implementation Plan). This Implementation Plan was required to be administered through an open, public process. The Cascadia Conservation District (Cascadia) has been the lead public jurisdiction to ensure the process has been followed.

Summary of Public Involvement

The identification, prioritization, and design of the Preston Reach Yurt Site Riparian Restoration Project (Yurt Site) has been accomplished within the framework of the Implementation Plan as administered by the Entiat Watershed Planning Unit (EWPU). A critical component to this EWPU planning process is public involvement. The participants in the EWPU are made up of a diverse group of stakeholders representing a wide range of interests including local governments and districts, citizens, tribes, state and federal agencies, irrigation, agriculture, forestry, community groups, conservation groups, economic development, and recreation. Development of the plan was done through a voluntary, collaborative process supported through the 1998 Watershed Management Act (RCW 90.82) which provided the framework and funding for locally-based planning of water resource related issues (the EWPU).

The Entiat Habitat Subcommittee (HSC) works enact the Implementation Plan as part of the EWPU and has been active in identifying priority actions to protect and enhance habitat of threatened and endangered species throughout the watershed, improving overall habitat function and connectivity. To do so, the subcommittee coordinates closely with the Upper Columbia Salmon Recovery Planning process and has conducted extensive public outreach within the Entiat River Watershed to better understand limiting factors and public priorities. The Entiat Habitat Subcommittee is made up of fish biologists from a variety of local, state and federal

December 9, 2009

Page 2

agencies and public utility districts, and representatives from local municipalities, community and conservation groups, agriculture, and private citizens.

One result of the planning/HSC process was the identification of valued salmon recovery projects in priority reaches of the Entiat River. The Yurt Site is one of these projects. The Yurt Site project is a collaborative effort between the U.S. Bureau of Reclamation (Reclamation) and Cascadia to implement a sequenced, reach-scale restoration approach on the Entiat River. As an extension of the HSC, an Interdisciplinary Team (IDT) has been developed to analyze project alternatives and guide the project through completion. Since the Yurt Site project was selected for an alternatives analysis by the HSC, Cascadia has conducted landowner outreach to affected and adjacent landowners in the project reach. This effort has included the following meetings to date:

- A letter was sent by Cascadia to all landowners in the Preston Reach on July 18, 2009 inviting participation in an informational meeting.
- A site visit to the Yurt Site on September 17, 2009 with the IDT to meet the primary landowners.
- Meeting on November 16, 2009 in SeaTac, WA with Cascadia and the Entiat Riverbend Board to discuss landowner views from the south side of the river across from the Yurt Site.
- HSC meeting on November 19, 2009 at the Entiat Fire Hall to present the 5 project alternatives.
- Meeting on December 7, 2009 with Cascadia and the primary Yurt Site landowner in Monroe, WA.
- Phone meeting on December 8, 2009 with Cascadia and the adjacent Yurt Site landowner.

Additional phone and email correspondence has continued with landowners and stakeholders throughout the Yurt Site alternatives analysis.

In January 2010, Cascadia will work closely with the IDT and Reclamation to select a preferred alternative and complete design plans. These design plans will be submitted via the JARPA to the resource agencies. The agencies and permits include:

- Chelan County Planning Department: Local Critical Areas Ordinance and SEPA Review
- The Washington State Department of Ecology (Ecology): Section 401 Water Quality Certification

December 9, 2009

Page 3

- The Seattle District Corps of Engineers (Corps): Section 404 Permit
- The Washington Department of Fish and Wildlife: Hydraulic Project Approval.
- The USFWS and NOAA Fisheries: Section 7 ESA Consultation.

All of these permits are processed under an open public, process. Depending on the type of permit issued, and the level of directly solicited public input, the requirements for public notices can vary. However, none of these local, state, and federal agencies should deny public requests for project information during the permit process.

Preston Reach Landowner Meeting
12 p.m., July 18, 2009
4491 Entiat River Road, Entiat Fire District #8 Fire Station

- | | | |
|-----|---|-------|
| (1) | Welcome and Introductions | 12:00 |
| (2) | Agenda review/approval | 12:15 |
| (3) | Introduction to Preston Reach Restoration (Java)
A. Interactive Power Point Presentation | 12:20 |
| (4) | Break | 1:00 |
| (5) | Guided Literature Review (Java, Rickel) | 1:15 |
| (6) | Group Discussion | 1:45 |
| (7) | Next Steps/ Next Meeting Time | 2:15 |
| (8) | Wrap up, Identify Agenda Items for Next Meeting and Adjourn | 2:30 |

This letter is to update you of changes to the schedule of restoration on the Entiat River. At this time, the Cascadia Conservation District and the Bureau of Reclamation are still in the design phase of developing various alternative restoration projects near your land parcel. Due to the immense scope of work, funding agencies for this project delayed the schedule for these designs until early spring of 2010. We expect to present design scenarios to landowners for comment and input in the spring, instead of this coming September. As before, if necessary, we can hold meetings closer to your area of permanent residence.

The Conservation District and other project partners foresee constructing one project in the summer of 2010. We anticipate working with landowners whom are actively working with us to develop a project to address salmon habitat and landowner concerns caused by eroding banks, and will likely include components of riparian planting, bank stabilization through placement of large woody debris in the river, and potentially bank armoring. We not expect engineers to complete the design scenarios for additional areas until this coming spring. In the summer of 2011, we will potentially construct two more projects. Project engineers will select parcels for restoration on factors including the largest benefit for salmon, landowner participation, and cost benefit analysis.

If you are interested in additional information on the Entiat River, the *WRIA 46 Management Plan* contains figures and information on current and historical river functioning. The *Detailed Implementation Plan* provides strategies, timelines, and goals toward restoration. These documents are available via our website at http://www.cascadiacd.org/index.php?page_id=255.

Other crucial documents are the *Entiat Tributary Assessment* and *Map Atlas*, which explore the restoration needs of the river. These are available at, <http://www.usbr.gov/pn/programs/fcrps/thp/ucao/entiat/tribassmt/index.html>.

There is also a very small-scale assessment called the Preston Reach Assessment, which provides potential ideas for projects. This report is not available via website at this time, but data CDs and hardcopies are available at your request. In addition, we can provide copies of the PowerPoint presented to landowners at the July 18th meeting.

The Cascadia Conservation District would again like to invite you to participate in an open dialogue regarding restoration on the Entiat River. Please provide us with up-dated contact information and your preferred mode of communication.

Have a great fall season,

Heather Java
Resource Specialist
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Wenatchee, WA 98801

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Seattle, WA 98146

John Bancroft
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Seattle, WA 98118

Kevin, Kyle and Johnny Cox
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Chelan, WA 98816

Anthony & Susan Puz Estate
3324 S. 9th St.
Tacoma, WA 98405

Stephen & Jill Gustafson
3640 Ridgeview Blvd
Wenatchee, WA 98801

Patricia Chieppa
c/o Doug Sipila
48510 284th Ave SE
Enumclaw, WA 98022

Florine N. Nelson
c/o Mark Rosenbaum
12610 35th Place NE
Lake Stevens, WA 98258

Bruce Simmons
12415 NE 130th Ct. H110
Kirkland, WA 98034

Hal and Kathy Hawley
5666 Entiat River Road
Entiat, WA 98822

Appendix C



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

APR - 2 2010

Regulatory Branch

National Marine Fisheries Service
Mr. Steve Landino
Washington State Director for Habitat Conservation
Washington State Habitat Office
510 Desmond Drive Southeast, Suite 103
Lacey, Washington 98503-1263

U.S. Fish and Wildlife Service
Ken S. Berg, Manager
Washington Fish and Wildlife Office
510 Desmond Drive Southeast, Suite 102
Lacey, Washington 98503-1263

U.S. Fish and Wildlife Service
Jessica L. Gonzales, Assistant Project Leader
Central Washington Field Office
215 Melody Lane, Suite 119
Wenatchee, Washington 98801-5933

Reference: 2008 Fish Passage and Restoration
Programmatic
2008/03598 (NMFS)
13410-2008-FWS # F-0209

Gentlemen and Madam:

We have enclosed six Specific Project Information Forms for your review, including one project, identified in the list below, which is funded through the American Recovery and Reinvestment Act (ARRA). We request your expedited review of the ARRA-funded action. For all of the projects, we concluded the effects are within the range of effects addressed in the biological opinion referenced above. Each project includes a Memorandum for the Services that identifies any project deviations from the biological opinion and provides our determinations of effect for species and critical habitat under your jurisdiction. We request your approval for use the 2008 Fish Passage and Restoration programmatic consultation to meet our requirements for these projects pursuant to Section 7 Endangered Species Act and the essential fish habitat provisions of the Magnuson-Stevens Fishery Conservation and Management Act. Please provide your electronic approval within 30 days from the date of this letter and sooner, if possible, for the ARRA-funded project. We request you send your electronic approval to the project manger responsible for the action and our staff

responsible for managing the programmatic consultation. The names and email addresses to whom you should transmit your email approval are provided in the Memorandum for the Services.

NWS-2010-342, Cascadia Conservation District (Knaub, PM), Chelan County, **ARRA funds**

NWS-2007-1698, Heath, Harold & Ernestine (Knaub, PM), Okanogan County

NWS-2009-362, Island Co. Dept. of Planning (Didenhover, PM), Island County, **FWS only**

NWS-2009-1451, WA State Dept. of Fish & Wildlife (Gregory, PM), Lewis County, **NMFS only**

NWS-2010-346, WA State Dept. of Transportation (McAndrew, PM), King County, **NMFS only**

NWS-2010-366, Issaquah Dept. of Public Works (Powell, PM), King County, **FWS only**

If you find any of the proposed projects do not qualify for use of the programmatic consultation, please notify us of the reason for your finding and provide an estimate of the amount of time necessary for you to complete the consultation. For non-qualifying projects, this letter will serve to initiate Section 7 Endangered Species Act consultation and consultation for essential fish habitat pursuant to the Magnuson-Stevens Fishery Conservation and Management Act.

A copy of this letter and the MFS will be furnished to the authorized agent for the above-listed projects or to the applicant if there is no authorized agent. More information on the Endangered Species Act consultation process can be found on our webpage at www.nws.usace.army.mil click on Regulatory – Regulatory/Permits. If you have any questions or comments concerning a [the] project, please contact the assigned project manager directly.

Sincerely,



Michelle Walker
Chief, Regulatory Branch

Enclosures

American Recovery and Reinvestment Act funding

Please expedite review

Re: 2008 Fish Passage and Restoration Programmatic ESA/EFH Consultation

NMFS Reference: 2008/03598

FWS Reference: 13410-2008-FWS# F-0209

Corps Reference Number: NWS-2010-342

Applicant's Name: Cascadia Conservation District

Project Manager: Debbie Knaub

Project Manager Phone Number: 509.682.7010

Date: 2 April 2010

This memorandum conveys to the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) the a summary of the effects to species and critical habitat protected under the Endangered Species Act (ESA) that the U.S. Army Corps of Engineers, Seattle District (Corps) has determined are likely to result from the proposed project. The purpose of this memorandum is to facilitate required Section 7 ESA review with FWS and/or NMFS regarding the proposed project. This document is not a Department of the Army permit and it does not authorize the applicant to commence work on the proposed project.

- I. **Project Location.** The proposed project is located in the Entiat River (RM 21.5), near the town of Brief, Chelan County, Washington
West ½ of Section 11, Township 27N, Range 19E
- II. **Fifth Field Hydraulic Unit Code.** 1702001001 (Entiat River)
- III. **Project Description.** Construct 14 engineered log jams (EJLs) along and a 100' wide riparian zone along ~ 645 linear feet of the Entiat River. The purpose of the project is to establish long-term woody vegetation at an outside meander bend of the river. Work will be isolated from flowing water by cofferdam; fish removal will be by seine and net. Work is expected to take ~ 3 months to complete.
- IV. **Excluded Actions.** Certain types of activities are identified in the Corps' programmatic biological assessment as "excluded" from coverage under the 2008 Fish Passage and Restoration programmatic ESA/EFH consultation (PC). The list below identifies components of the project that are proposed by the applicant but are excluded activities under the PC or are CMs with which the project will not comply.
- The project is located in a bull trout core area; however, no spawning occurs in the project area based on coordination with FWS (Martha Jensen, Jeff Krupka).
- The applicant has proposed a longer work window than typically is used for this reach of the Entiat River but the extended window is preliminarily agreed to by WDFW (Connie Iten) according to information provided in the SPIF. The Corps (Maryann Baird) contacted WDFW (Iten) on 3/30/10 to verify the longer work window would be authorized under Hydraulic Project Approval but to date a response from WDFW has not been received.
- V. **Corps Regulatory Jurisdiction.**
- Clean Water Act, Section 404 Rivers and Harbors Act, Section 10
- VI. **Service from Which Electronic Approval or Consultation is Requested.** The Corps requests electronic approval or consultation for this project from:
- U.S. Fish and Wildlife Service National Marine Fisheries Service
- VII. **Determinations of Effect.** Based on the information provided in attached Specific Project Information Form, the Corps has determined that the proposed project will have the following effects on ESA protected species and critical habitat.

<i>ESA SPECIES & CRITICAL HABITAT</i>	<i>DETERMINATION OF EFFECT</i>
---	--------------------------------

Reference Number: NWS-2010-342 (Cascadia Conservation District)

1

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NMFS Species & Critical Habitat			
Chinook, Upper Columbia River (UCR) spring	<input type="checkbox"/> NE ¹	<input type="checkbox"/> NLAA ²	<input checked="" type="checkbox"/> LAA ³
Chinook, UCR spring critical habitat	<input type="checkbox"/> NE	<input checked="" type="checkbox"/> NLAA	<input type="checkbox"/> LAA
Steelhead, UCR	<input type="checkbox"/> NE	<input type="checkbox"/> NLAA	<input checked="" type="checkbox"/> LAA
Steelhead, UCR critical habitat	<input type="checkbox"/> NE	<input checked="" type="checkbox"/> NLAA	<input type="checkbox"/> LAA
<i>NOTE TO NMFS. Because the work entails isolation of the work area, fish removal, and conducting work outside the typical inwater work window, the Corps believes an LAA determination is warranted for the species and does not agree with the NLAA determination given in the SPIF.</i>			
FWS Species & Critical Habitat (CH)			
Bull trout, Columbia River	<input type="checkbox"/> NE	<input type="checkbox"/> NLAA	<input checked="" type="checkbox"/> LAA
Bull trout, CR critical habitat (proposed)	<input type="checkbox"/> NE	<input checked="" type="checkbox"/> NLAA	<input type="checkbox"/> LAA
<i>NOTE TO FWS. Because the work entails isolation of the work area, fish removal, and conducting work outside the typical inwater work window, the Corps believes an LAA determination is warranted for the species and does not agree with the NLAA determination given in the SPIF.</i>			

VIII. Essential Fish Habitat (EFH). EFH has been designated for the following groups in the project area:
 None in project area Pacific salmon Coastal pelagic Groundfish

The Corps has determined that the proposed project would have the following effect on EFH.

No EFH in project area Would not adversely affect Would adversely affect

IX. Allowable Work Window: According to sections I.E and I.F of the Specific Project Information Form, the applicant proposed an allowable inwater work window as shown in the table below. The proposed inwater work window is outside the typical WDFW work window for the Entiat River (which is 1 July through 31 July).

Project Start Date: 15 July	Inwater start date: 15 July
Project End Date: 15 November	Inwater end date: 30 September

X. Attached Documents. The following documents are included with this MFS.

A. Specific Project Information Form, dated 5 February 2010.

B. Fifteen (15) project drawings, dated 12 January 2010

XI. Special Conditions. To ensure the effects of the project will be as determined, the following conditions will be conditions of the Corps permit:

A. The Corps would add this special condition if the Services approve the use of the 2008 Fish Passage and Restoration programmatic consultation for meeting the project ESA / EFH consultation requirements:

In order to meet the requirements of the Endangered Species Act (ESA) 2008 Fish Passage and Restoration Programmatic Consultation (National Marine Fisheries Reference No. 2008/03598; U.S. Fish and Wildlife Service Reference No. 1341-2008-FWS- #F-0209), you must comply with the conditions included in the Specific Project Information Form dated [DATE], and the enclosed electronic approval from National Marine Fisheries Service dated [DATE], and the U.S. Fish and

¹ NE is 'no effect'

² NLAA is 'not likely to adversely affect'

³ LAA is 'likely to adversely affect'

Wildlife Service dated [DATE]. If you cannot comply with the terms and conditions of this programmatic consultation, you must, prior to commencing construction, contact the U.S. Army Corps of Engineers (Corps), Seattle District, Regulatory Branch for an individual consultation in accordance with the requirements of the ESA and/of the Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996.

- B. The Corps would add this special condition if a Service required an informal individual ESA consultation for the proposed project:

You must implement and abide by the Endangered Species Act (ESA) requirements and/or agreements set forth in your Reference Biological Evaluation Specific Project Information Form, dated [DATE], and the addendum dated [DATE], in their entirety. The National Marine Fisheries Service (NMFS) concurred with a finding of "may affect, not likely to adversely affect" based on this/these document(s) on [DATE] (NMFS Reference Number ###). The U.S. Fish and Wildlife Service (USFWS) concurred with a finding of "may affect, not likely to adversely affect" based on this/these document(s) on [DATE] (USFWS Reference Number ###). Both agencies will be informed of this permit issuance. Failure to comply with the commitments made in this/these document(s) constitutes non-compliance with the ESA and your U.S. Army Corps of Engineers permit. The USFWS/NMFS is the appropriate authority to determine compliance with ESA.

- C. The Corps would add this special condition if a Service required individual formal ESA consultation for the proposed project:

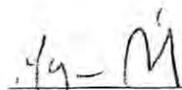
This U.S. Army Corps of Engineers (Corps) permit does not authorize you to take a threatened or endangered species, in particular the [LIST SPECIES OF CONCERN]. In order to legally take a listed species, you must have a separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permits, or ESA Section 7 consultation Biological Opinion (BO) with non-discretionary "incidental take" provisions with which you must comply). The enclosed BO(s) prepared by the National Marine Fisheries Service (NMFS) dated [DATE] and the U.S. Fish and Wildlife Service (USFWS) dated [DATE] contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with the specified "incidental take" in the BO (NMFS Reference Number ###, USFWS Reference Number ###). Your authorization under this Corps permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO(s). These terms and conditions are incorporated by reference in this permit. Failure to comply with the commitments made in this document constitutes non-compliance with the ESA and your Corps permit. The USFWS/NMFS is the appropriate authority to determine compliance with ESA.

- D. In order to meet the requirements of the Endangered Species Act and protect Columbia River bull trout, upper Columbia River steelhead, and upper Columbia River spring Chinook, the permittee may conduct the authorized activities from 15 July through 30 September in any year this permit is valid. The permittee shall not conduct work authorized by this permit from 1 October through 14 July in any year this permit is valid.

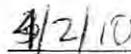
XII. Transmit Electronic Approval To. The Corps requests that the Services transmit their electronic approval for this action under the 2008 Fish Passage and Restoration programmatic consultation to the following Corps staff:

- A. Deborah.J.Knaub@usace.army.mil
- B. Maryann.Baird@usace.army.mil
- C. Jacalen.M.Printz@usace.army.mil

XIII. Signature.



Maryann Baird, Endangered Species Act Coordinator



Date

Reference Number: NWS-2010-342 (Cascadia Conservation District)

3

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From: Karl_Halupka@fws.gov
To: [Knaub, Deborah J NWS](#); [Baird, Maryann NWS](#); [Printz, Jacalen M NWS](#)
Cc: mike.rickel@wa.nacdn.net
Subject: NWS-2010-342 Entiat River ELJ and Riparian Planting at RM 21.5 - ARRA project
Date: Friday, April 30, 2010 9:38:06 AM

Debbie, Maryann, and Jacalen,

This responds to your April 2, 2010, request for initiation of consultation in accordance with section 7(a)(2) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.), for project number NWS-2010-342, proposed by the Cascadia Conservation District. This Project is located in Chelan County, Washington, and involves installation of engineered log jams and planting of riparian vegetation near river mile 21.5 on the Entiat River. This work may affect the bull trout (*Salvelinus confluentus*) and its proposed critical habitat. We have assigned U.S. Fish and Wildlife Service (Service) reference number 13260-2010-F-0048 to this Project. Please refer to this reference number in future correspondence.

In your Memorandum for the Services (MFS) and Specific Project Information Form (SPIF), you described the anticipated effects of this Project on listed species and how this Project is generally consistent with the categories of restoration actions described in the Washington State Fish Passage and Habitat Enhancement Programmatic (Programmatic). The Memorandum for the Services specified that this Project involves two activities that are excluded from coverage under the Programmatic. The first of these is the location of the Project within spawning and rearing habitat for bull trout in the Entiat River, as classified in maps developed for proposed bull trout critical habitat. The second involves extension of the proposed in-water work window from the typical date for the Entiat River of 31 July to 30 September.

We believe these excluded Project activities will not result in effects to bull trout that are different in scope or intensity from those anticipated in the Programmatic. Although the Project area is currently classified as bull trout spawning and rearing habitat, bull trout spawning in the Entiat River typically occurs above river mile 29 (at least 7.5 miles upstream from the Project area). Bull trout redds are therefore unlikely to be exposed to Project-related sedimentation, and spawning adults will not be disturbed by construction activities. Some adults migrating upstream to spawning areas may be exposed to Project related disturbance, but available information indicates most adults should be upstream of the Project area when construction begins on 15 July. Sub-adult and rearing bull trout are likely to be present in very low densities in the Project area, because habitat complexity in this area currently is limited and riparian cover is virtually nonexistent. Extension of the in-water work window to 30 September has greater potential to increase Project effects on bull trout, but we believe these potential effects can be largely avoided by implementing conservation measures. Available information indicates that post-spawning emigration of adult bull trout typically begins around 15 September and peaks in mid-October, with movement concentrated during nighttime hours. The SPIF specified that work would occur only during daytime hours. We recommend that in-water work after 15 September be constrained to the period that begins an hour after sunrise and ends an hour before sunset. This measure would allow bull trout to have the entire twilight and nighttime periods for undisturbed migration and will also provide an opportunity for sediment pulses generated by construction to settle and dissipate before nighttime movements of bull trout begin. We discussed this conservation measure with the Project applicant and they were amenable to including it in the Project. They also were confident it would not compromise their ability to complete the Project on schedule. Therefore, we feel it is appropriate to tier this Project to the Programmatic, despite the occurrence of two excluded activities, because additional effects potentially associated with these activities are unlikely due to site-specific conditions, or they can be effectively avoided.

During our review of the SPIF and ensuing conversation with the Project applicant we identified two features of the Project that have the potential to diminish its effectiveness as a habitat restoration project. First, the design calls for construction of a "high bench" also referred to as a "wet bench," that is 2 to 3 feet below the top of the bank and that will have large wood placements and will be revegetated. The plans do not make clear if this wet bench could be a stranding hazard or if design elements are incorporated to minimize this risk (e.g., positive drainage back to the river). Second, the

plans call for compaction to 85 percent of maximum density for backfill placed in keyways for large logs oriented roughly perpendicular to the bank. This level of compaction could reduce growth and survival of riparian plantings.

To address these two issues, the Service offers the following conservation recommendations. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. Section 7(a)(1) of the Act requires Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Regarding the wet bench, we recommend incorporating features into the final grading of the bench that will minimize stranding risk. Regarding soil compaction, we recommend making it clear to contractors that this compaction specification applies only to keyways for large logs and that compaction of surrounding areas should be minimized. Finally, we recommend that every effort be made to complete in-water work before 15 September to avoid potential effects on emigrating, post-spawning, adult bull trout.

Your MFS also included a note explaining that because the proposed Project entails isolation of multiple work areas, fish removal from these areas, and conducting work outside the typical in-water work window that you did not agree with the applicants determination of "not likely to adversely affect" the bull trout. We agree with your assessment that a determination of "likely to adversely affect" the bull trout is warranted.

Based on the information provided in the SPIF, the Service agrees that this Project is consistent with the restoration actions and conservation measures described in the Programmatic, and therefore may be tiered to the Service's July 8, 2008, Biological Opinion and June 30, 2008, Letter of Concurrence with the Programmatic (USFWS Reference 13410-2008-F-0209). The Service concurs with your determinations of "likely to adversely affect" the bull trout and that this Project will not destroy or adversely modify proposed critical habitat for the bull trout. We do not expect effects to other listed species and their habitats to occur.

This concludes consultation pursuant to the implementing regulations of the Endangered Species Act, 50 C.F.R. § 402.13. This Project should be reanalyzed if new information reveals effects of the action that may affect listed or proposed species or designated or proposed critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to a listed or proposed species or designated or proposed critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this Project.

Please contact me if you have any questions.

Karl

Karl Halupka
Fish and Wildlife Biologist
U.S. Fish and Wildlife Service
215 Melody Lane, Suite 119
Wenatchee, Washington 98801
Phone: 509.665.3508 x11