BONNEVILLE POWER ADMINISTRATION

UNITED STATES FOREST SERVICE

Eightmile Ranch Coho Acclimation Site

Draft Environmental Assessment

December 2014

DOE/EA-1959

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Bonneville Power Administration

U.S. Forest Service, Okanogan-Wenatchee National Forest

Methow Valley Ranger District

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CHAPTER 1. PURPOSE OF AND NEED FOR ACTION

1.1. Introduction

The Eightmile Ranch Coho Acclimation Site is a new pond proposed to acclimate coho salmon (*Onchorhynchus kisutch*) before releasing them in the Methow basin in Okanogan County in north central Washington state. Bonneville Power Administration (BPA) is considering whether to fund construction and operation of the facility as part of the Mid-Columbia Coho Restoration Program, which is being implemented by the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation). An acclimation site at Eightmile Ranch would replace sites on the Chewuch River which were evaluated in the Mid-Columbia Coho Restoration Program Final Environmental Impact Statement (EIS) (DOE/EIS 2012) and later became unavailable for development.

Coho produced from adults that return to the Methow are incubated and reared at hatcheries, including Winthrop National Fish Hatchery in the Methow basin. When the juvenile coho reach the stage where they are 6 to 8 weeks from being ready to migrate downstream (pre-smolt stage), they are transported to acclimation ponds to allow them to imprint on waters to which they would return to spawn as adults. They are held in the acclimation ponds until they are ready to migrate, at which time they are allowed to leave the ponds on their own volition.

The new acclimation pond is proposed on National Forest land adjacent to the Chewuch River, which flows into the Methow River, a tributary to the Columbia River (Figure 1-1). The Okanogan-Wenatchee National Forest, Methow Valley Ranger District (Forest Service), is considering whether to issue a Special Use Permit (SUP) to the Yakama Nation that would allow for the construction and operation of the acclimation site. The Forest Service also is considering a project-specific amendment to Okanogan Forest Plan Standard and Guideline 9-4 that would allow for an intake to supply water to the new pond. The amendment would be necessary in order for the Forest Service to issue a Special Use Permit.

This Environmental Assessment (EA) was prepared pursuant to the National Environmental Policy Act (42 U.S. Code [USC] 4321 *et seq.*) and the Council on Environmental Quality Implementing Regulations, which require federal agencies to assess the impacts that their actions may have on the environment. BPA and the Forest Service are joint lead agencies in the development of this EA.

1.2 Underlying Need for Action

BPA needs to decide whether to provide funding to the Yakama Nation to construct and operate the Eightmile Ranch Coho Acclimation Site to replace sites identified in the Mid-Columbia Coho Restoration Program Final EIS and Record of Decision that could not be developed.

The Forest Service needs to respond to the Yakama Nation's application for a Special Use Permit for the proposed acclimation site.

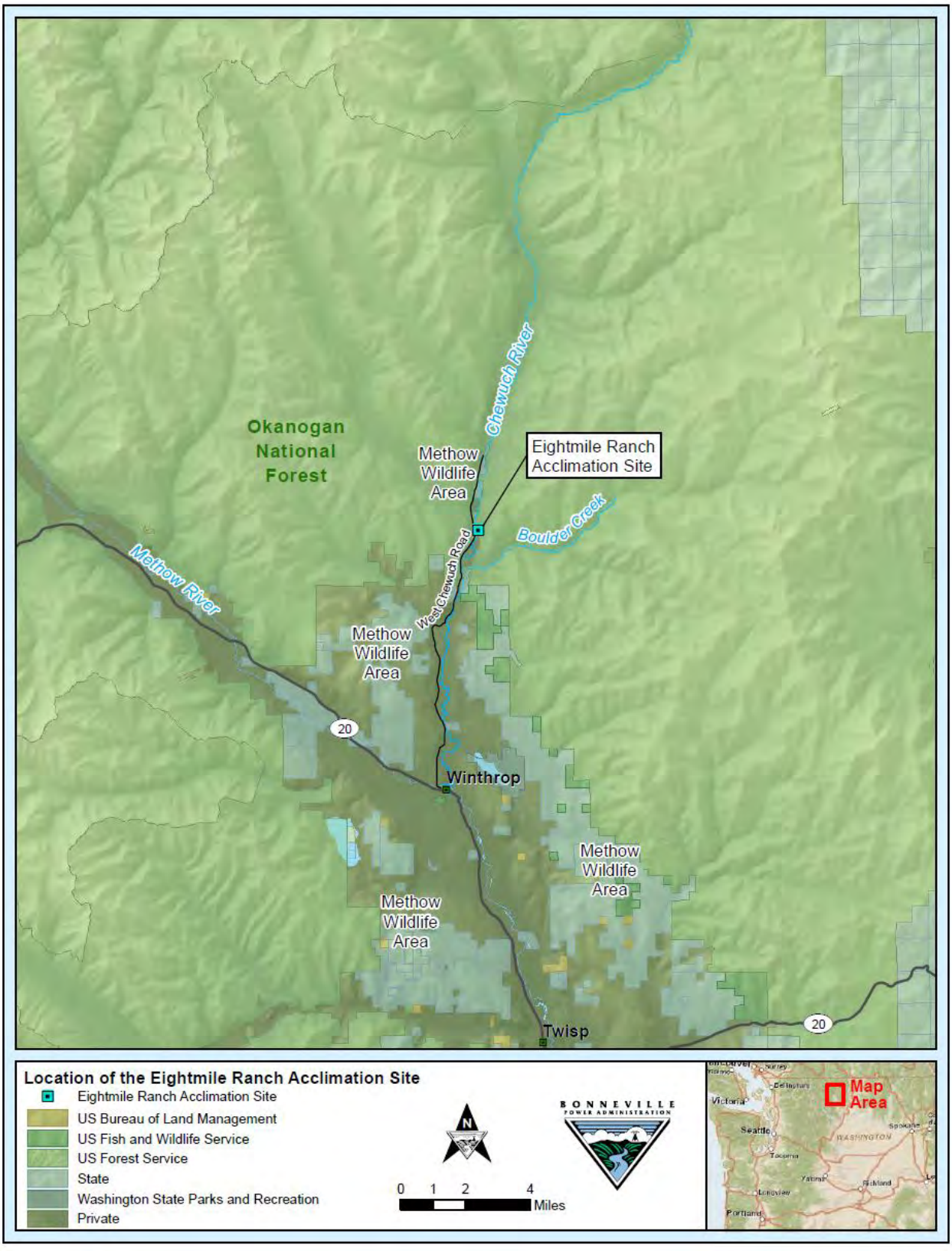


Figure 1-1. Location of the Eightmile Ranch Coho Acclimation Site

1.3 Purposes

In meeting the underlying need, the alternatives considered should achieve the purposes listed below.

For BPA, the alternatives should meet the following purposes:

- Support efforts to protect, mitigate and enhance fish and wildlife for effects of the Federal Columbia River Power System (FCRPS) in the mainstem Columbia River and its tributaries pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 USC 839b(h)(10)(A)).
- Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement with the Yakama Nation and others.
- Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction which calls for protecting weak stocks, like the Upper Columbia steelhead and spring Chinook, while sustaining overall populations of fish for their economic and cultural value (BPA 2003).

For the Forest Service, the alternatives should be consistent with Forest Service policies and plans, including the Okanogan National Forest Land and Resource Management Plan and EIS of 1989 and amendments.

Both agencies seek an alternative that minimizes harm to natural and human resources, including species listed under the Endangered Species Act (ESA) (16 USC 1531 *et seq.*).

1.4 Background Information

Coho salmon were extirpated from the Wenatchee and Methow river basins in the early 1900s. In 1996, the Yakama Nation initiated feasibility studies to determine if it was possible to restore coho to this area. The feasibility studies received substantial public and agency review between 1996 and 2006, when a Master Plan to implement a full program to reintroduce coho to the two basins was proposed to the Northwest Power and Conservation Council (Council) under its Fish and Wildlife Program. After considerable public and agency review, including several reviews by the Council's Independent Scientific Review Panel, the Proposed Action, as detailed in the Master Plan (YN 2010), was considered ready for environmental analysis under the National Environmental Policy Act (NEPA). A draft EIS on the proposed Mid-Columbia Coho Restoration Program was issued in June 2011. The Proposed Action was further revised based on public comments, and the Mid-Columbia Coho Restoration Program Final EIS was issued in March 2012 (USDOE/BPA 2012). In July 2012, BPA issued a Record of Decision (ROD) documenting its decision to implement the Proposed Action as described in the Final EIS.

With the 2012 ROD, BPA is providing funding to the Yakama Nation to expand its efforts to reintroduce coho into the Wenatchee and Methow basins. The funding supports activities that provide sufficient numbers of coho smolts released in multiple tributaries throughout both basins to disperse returning coho adults in suitable habitat and to encourage establishment of a self-sustaining, naturally reproducing population with tribal and non-tribal harvest in most years. To accomplish this goal, the program includes, among other actions, construction and/or use of 24 acclimation sites in the Wenatchee and Methow basins, distributed throughout ten tributaries

in the Wenatchee basin and six tributaries in the Methow basin. Acclimation helps the young salmon to imprint on a location so that they will return there to spawn as adults.

Since publication of the Final EIS, several proposed acclimation sites proved not to be viable for various reasons. In the Chewuch River subbasin, those sites included all three of the primary sites (Mason, Pete Creek Pond, and Methow State Wildlife Area-Eightmile), and the Methow Salmon Recovery Foundation-Chewuch backup site. The sites were eliminated for a variety of reasons, including landowners who decided not to participate in the program, as well as water supply concerns. In order to have sufficient numbers of coho released in the Chewuch subbasin to support natural production and to provide broad distribution of coho throughout the entire Methow basin,[1] the Yakama Nation proposes to replace the eliminated Chewuch River sites with a site at Eightmile Ranch, on National Forest land adjacent to the Chewuch River. The existing Chewuch Acclimation Facility backup site described in the EIS would also be used, but its capacity is limited. Since none of the original project sites proposed in the EIS was located on National Forest land, the Forest Service was not cooperating agency on the EIS. Therefore, BPA and the Forest Service have jointly prepared this EA for the proposed replacement site on National Forest land.

1.5 Management Direction

For this EA, BPA incorporates by reference the Mid-Columbia Coho Final EIS and appendices in their entirety (USDOE/BPA 2012). The EIS evaluates the impacts of a program to restore coho salmon to the Wenatchee and Methow basins, from which they had been extirpated. Impacts of construction and operation of 24 proposed acclimation sites in the two basins, plus a small new hatchery in the Wenatchee basin were evaluated. Impacts of backup sites were also evaluated. Conclusions from that analysis are summarized in the appropriate resource analysis sections in Chapter 3 of this EA.

The Forest Service tiers this document and analysis to the Okanogan National Forest Land and Resource Management Plan Final Environmental Impact Statement and Record of Decision (USDA/FS 1989), as amended by the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl ("Northwest Forest Plan," USDA/FS and USDI/BLM 1994) and its subsequent 2001 amendment for Survey and Manage Species (USDA/FS and USDI/BLM 2001); and the Final EIS and Record of Decision for Preventing and Managing Invasive Plants—Pacific Northwest Region—Invasive Plant Program (USDA/FS 2005a).

In the Northwest Forest Plan, the project is located within the Matrix land use allocation (a multiple-use designation) and mostly within the Riparian Reserve land use allocation (USDA/FS and USDI/BLM 1994). Riparian Reserves are a component of the Aquatic Conservation Strategy (ACS), as defined in the Northwest Forest Plan. The Lower Chewuch watershed is identified as a Tier 1 Key Watershed under the Northwest Forest Plan. These watersheds were designated for their contributions to habitat for anadromous salmonids. Specific Northwest Forest Plan Standards and Guidelines for Riparian Reserves and ACS consistency are discussed in Chapter 3 of this EA.

[1] The scientific basis for the release numbers and locations is documented in the Final EIS (USDOE/BPA 2012), Section 2.2.1. Available at http://efw.bpa.gov/environmental_services/Document_Library/Mid-Columbia_Coho_Restoration_Project.

The proposed acclimation pond is located along a portion of the Chewuch River identified in the Okanogan Forest Plan as eligible for Wild and Scenic River designation in the scenic category (USDA/FS 1989). The Forest Plan includes standards and guidelines to ensure that management actions do not affect the eligibility of rivers to be considered by Congress for inclusion in the Wild and Scenic Rivers System.

In the Okanogan Forest Plan, the proposed acclimation pond is located within Okanogan Forest Plan Management Area (MA) 5 (USDA/FS 1989). MA 5 objectives are to provide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective (VQO) of Retention or Partial Retention. In the project area, the VQO is Retention, as viewed from the Chewuch River corridor, from Chewuch Forest Road 5100, and from Eightmile Ranch Administrative Site (the project area is encompassed by the boundaries of the Administrative Site). In areas designated Retention, visitors should perceive foreground landscapes as natural-appearing, where the valued landscape characteristics appear intact.

The Proposed Action's consistency with the management guidance applicable to this project is discussed as part of each resource analysis in Chapter 3.

1.6 Public Involvement

1.6.1 Scoping Summary

BPA and the Forest Service initiated government-to-government consultation with the Yakama Nation and the Confederated Tribes of the Colville Reservation (Colville Tribes) by letter dated March 29, 2013. A response was received from the Colville Tribes regarding tribal land and treaty rights.

BPA and the Forest Service announced their intention to prepare an EA on April 12, 2013. The project has been listed on the Forest Service Schedule of Proposed Actions since April 2013. The two agencies requested interested parties to comment on the action in order to help define the scope of the EA. Letters were sent to state, federal, and local agencies expected to have an interest in the project; to Indian tribes in the area; and to individuals and organizations that had expressed an interest in BPA or Forest Service activities in this area in the past. Organizations and individuals contacted are listed in Chapter 5 of this EA. A 30-day public scoping period ended on May 13, 2013.

Comments were received from eight entities and covered a wide range of issues. The comments are summarized below; the full text of the comments, including copies of any letters received, is posted on BPA's website at *www.bpa.gov/comment*.

Need:

- What is the scientific or economic rationale for this project?
- Why is BPA considering funding a purely commercial fishing proposal?
- How does this project increase the need to spend more ratepayer dollars on other salmon recovery efforts?
- Why another multi-million dollar "investment" funded by the taxpayers in this economy?

The reasons BPA and the Forest Service are considering the proposal are addressed in Sections 1.1 through 1.4 of this chapter (Chapter 1 Purpose of and Need for Action).

Project description:

- What method will be used to prevent water seepage from the pond?

- How long will construction take?

These issues are addressed in Chapter 2 Alternatives Including the Proposed Action, Sections 2.1.1 and 2.4.1.

Funding:

- Will taxpayer money be used for the project or is funding solely from BPA power sales revenues?
- What will be the ongoing funding requirements for operation and maintenance of the project as proposed?
- Is the intent to use ratepayer dollars to finance the operation costs?

These issues are addressed in Chapter 2, Section 2.6.

Land use:

- Consider the proximity of the project to the 8-Mile Sno Park.
- Consider the effect of the project on use of the ranch as a field camp during fire season; will there be any restrictions that prevent this area being used during fire incidents?
- Will this proposal affect grazing or any other activities up- or downstream from the project area?

The concern over use of the site for fire-fighting needs was addressed in development of alternatives (see Chapter 2). Effects of the project on current land use at and near the site, including uses during fires, are addressed in the Land Use section of Chapter 3.

Water rights:

- Does a water right currently exist for the project?
- Has the process to acquire or change a water right begun?
- This project should be subject to the same requirements regarding water rights as other users in the Methow.

How the project affects the water rights of others is addressed in the Water Quantity section in Chapter 3; process issues related to water use are discussed throughout Chapters 2 and 3.

Vegetation:

- What are the planned methods of preventing or eliminating noxious weeds after excavation and backfill of trenches and pond area(s)?
- Will native grasses and other native plantings be used to re-vegetate the disturbed soils?
- What are the size, number and species of trees that will be removed to establish the ponds and infrastructure?

The replanting and reclamation plans for the alternatives are summarized in Chapter 2, Section 2.5, and are attached in full as Appendices 1 and 2. Effects of the alternatives on vegetation are described in the Botany and Invasive Plants sections of Chapter 3.

Visual impacts:

- What will be the method of reducing the visual impact of the fencing surrounding the pond(s)?

This issue is addressed in the description of the alternatives in Chapter 2, Section 2.1.2 and in the Visual Quality and Recreation section of Chapter 3.

Fish:

- What effect will the project have on native salmon?
- Will this in any way benefit the migration of native salmon (assuming there are any) as they return upstream to spawn?
- How will the project affect salmon restoration?
- How many Chinook currently return to this area?
- When were the last counts conducted?
- What is the projected return for coho to this area?
- What scientific data exists that quantifies that there are no impacts to listed species?

The Fish section of Chapter 3 contains a summary of the extensive analysis of this issue that was prepared for the EIS on the overall reintroduction program and for the ESA consultations with National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS).

Sedimentation:

- What is the potential for increased sediment in the Methow River and what are the potential impacts of the sediment?
- Are different standards for allowable sedimentation applied to this project than to other users of Forest Service land?

Measures to limit sedimentation in the river during construction and operation are described in Chapter 2, Section 2.5 (Design Criteria). Effects of construction are discussed in the Water Quality section of Chapter 3.

Tribal issues:

- Yakama Nation is infringing on traditional Colville tribal lands.
- Yakama Nation is usurping the Colvilles' proper role in restoration of coho as well as other species in the Methow basin.

The Socioeconomic and Cultural Resources sections of Ch. 3 summarize economic and social effects of the project, including effects on tribal culture, issues that were addressed in detail as part of the overall program in the Mid-Columbia Restoration Program EIS (USDOE/BPA 2012). Issues of the tribes' respective roles in the Methow basin are being addressed in government-to-government consultations and are outside the scope of the EA.

Process:

- Why are we being asked for comment when the project is set in stone?
- Did everyone in the Methow receive notice of this project or did I because I own property near a salmon enhancement site?
- Okanogan County is concerned that the Forest Service has failed to coordinate with the county or provide meaningful opportunities to be involved in the development of the proposal.

Chapter 5 provides the list of individuals and entities consulted. The process and purpose of scoping is discussed in the introduction to this section (Section 1.6). The issue of coordination with Okanogan County is addressed in the section in Chapter 3 on Other Consultation/Compliance Issues.

General: Four comments either supporting or opposing the project were received.

Issues outside the scope of this EA: The EA should evaluate the efficacy, financial and otherwise, of the other salmon enhancement projects in the area and inform the public of the findings via substantial print and other media.

1.6.2 Public Review Process

This Draft EA will be available for a 30-day public review period, during which interested parties are encouraged to provide comments on the Proposed Action. Comments will be reviewed by BPA and the Forest Service, and the EA will be modified in response to comments, as appropriate. Once the EA is issued in final form, under Forest Service rules as stated below, members of the public have 45 days to object to the proposal before a final decision is made.

On March 27, 2013, a final rule revising 36 CFR Part 218 was published in the Federal Register Volume 78, No. 59. The new rule replaces the previous appeal rules defined in 36 CFR 215, and expands the use of the pre-decisional objection process. The new rule provides the public an opportunity to comment and express concerns on projects before decisions are made, rather than after. This project implements the Okanogan Forest Plan and is subject to the pre-decisional objection regulations at 36 CFR 218 Subparts A and B.

CHAPTER 2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

The Proposed Action is for BPA to fund construction and operation of a pond in which to acclimate approximately 200,000 coho salmon for 6-8 weeks each year between March and early June for approximately 20 years. The proposed pond would be located at Eightmile Ranch, which is managed by the U.S. Forest Service, Okanogan-Wenatchee National Forest. The acclimation pond would be operated by the Yakama Nation. The Okanogan-Wenatchee National Forest proposes to amend the Forest Plan and to grant a Special Use Permit to the Yakama Nation to construct and operate the pond.

The Proposed Action requires construction of a new pond, water supply and discharge pipelines and structures, and a new power supply. The proposal also includes plans for re-vegetation of disturbed areas and reclamation of the site once it is no longer needed. Two different pond locations on the Eightmile Ranch are being considered, Location 1 and Location 2 (Figure 2-1).

A No Action Alternative of not amending the Forest Plan, granting the Special Use Permit, or funding construction and operation of the acclimation pond is also being considered.

In this chapter, Section 2.1 describes project elements common to both locations for the Proposed Action. Sections 2.2 and 2.3 describe the location, design, and mitigation elements unique to each location. Section 2.4 summarizes in general terms the construction and operations activities of the Proposed Action, and Section 2.5 outlines in detail the design criteria, including mitigation measures, that would be used for either location. Section 2.6 discusses the costs of the Proposed Action. Section 2.7 characterizes the No Action Alternative. Section 2.8 discusses the location alternative that was considered but eliminated from detailed evaluation in this EA. Section 2.9 compares the action and no-action alternatives in terms of their ability to meet the purposes outlined in Chapter 1 and their environmental impacts as described in Chapter 3.

2.1 Elements Common to Both Locations

2.1.1 Acclimation Pond

Acclimation of 200,000 coho smolts would require a minimum of 38,000 cubic feet of pond volume and occupy approximately a third of an acre. The elevation of the pond and location of the intake would allow the pond to be supplied with water via gravity flow during both high and low river flows, which means that the water level in the pond would rise and fall with river levels and would not require pumping. Proposed pond designs would provide 38,000 cubic feet of volume during low flow conditions and more at higher flows. The pond would have a dirt bottom and the sides would be sloped at a run of 2 feet for every rise of 1 foot to prevent erosion and to minimize risks to human safety. The pond would have an irregular shape and would use native vegetation, boulders, and natural materials to screen it and the surrounding fence from viewers on West Chewuch Road (Forest Road 5100), the ranch administrative site, and the Chewuch River. Sections 3.10 and 3.11 in Chapter 3 discuss the issue of scenic impacts in detail.

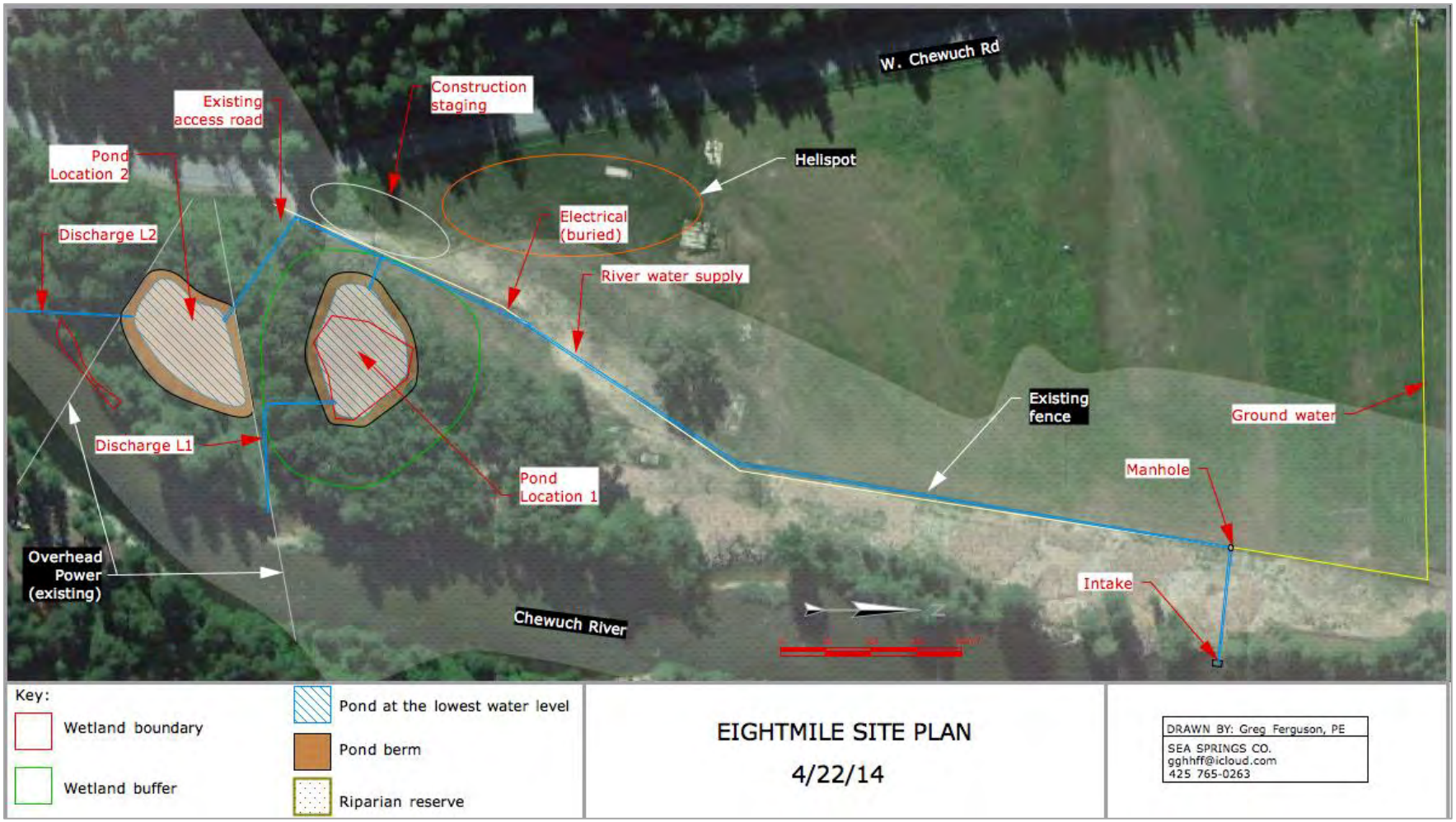


Figure 2-1. Eightmile Ranch Coho Acclimation Pond: Alternative Locations

2.1.2 Fencing

Fencing around the pond would limit human access to the ponds for safety purposes and would reduce predation by mammals such as river otters and minks during acclimation. The fence would be 8 feet tall, buried 6 inches into the ground. The fence would be vinyl-coated steel, with a 2-inch by 2-inch mesh in a dark earth-toned color so that it would be less visible from viewpoints such as West Chewuch Road or the river during all seasons of the year.

2.1.3 Surface Water Supply

During the March to June acclimation period, the pond would be supplied by gravity flow from the Chewuch River through a screened intake to a concrete manhole, piped to the acclimation pond, and then discharged by pipe back to the Chewuch River. Minimum requirements to supply the pond are 3.1 cubic feet per second (cfs), but water rights and supply systems would be designed to include a 50% safety factor, or 4.6 cfs. Measures would be implemented to ensure minimum instream flows established by Washington Department of Ecology (WDOE) would be maintained. See Sections 2.5.10 and 3.3.

Lengths for the water supply and discharge pipelines vary depending on the pond location and are discussed under the specific alternative descriptions. The pipeline trenches would be a minimum of 32 inches wide; depth beneath the surface could be as much as 12 feet (Figure 2-2). All trenches would be filled and replanted with native vegetation to match the surrounding vegetation.

Water Intake

The intake screen would meet NMFS and Washington Department of Fish and Wildlife (WDFW) screening criteria (NMFS 2008; Revised Code of Washington (RCW) 77.57.010 and RCW 77.57.070) and would be sloped to conform to the stream bank (Figure 2-2).

Because this section of the Chewuch River is a candidate for Wild and Scenic River status and popular with recreational boaters, the project is proposing special measures to minimize the visibility of constructed project elements and potential impacts to recreational users of the river. The intake would be submerged below the low-water line to minimize its visibility from oblique angles. During the nine months of the year that fish are not being acclimated, the fish screens would be pulled and replaced with steel sheets that would be painted with camouflage colors. The intake would also be partially obscured by a log jam at the site that is one of several that were installed as part of a separate Yakama Nation habitat improvement project (BPA Fish and Wildlife Project 2009-003-00) and by vegetation planted along the stream bank. Figure 2-2 shows the design of the intake in conjunction with the engineered log jam; Figure 2-3 is a photograph of a typical intake structure.

The intake flow during the March to early June acclimation period would not be sufficient to endanger recreational boaters on the river. Water velocities at the screen face of the intake must be less than 0.2 foot per second and the design velocity would be 0.1 foot per second; given the river flows during this period, such velocities would not be noticeable by river users. The intake would include a system that would use compressed air to move debris off the screen surface.

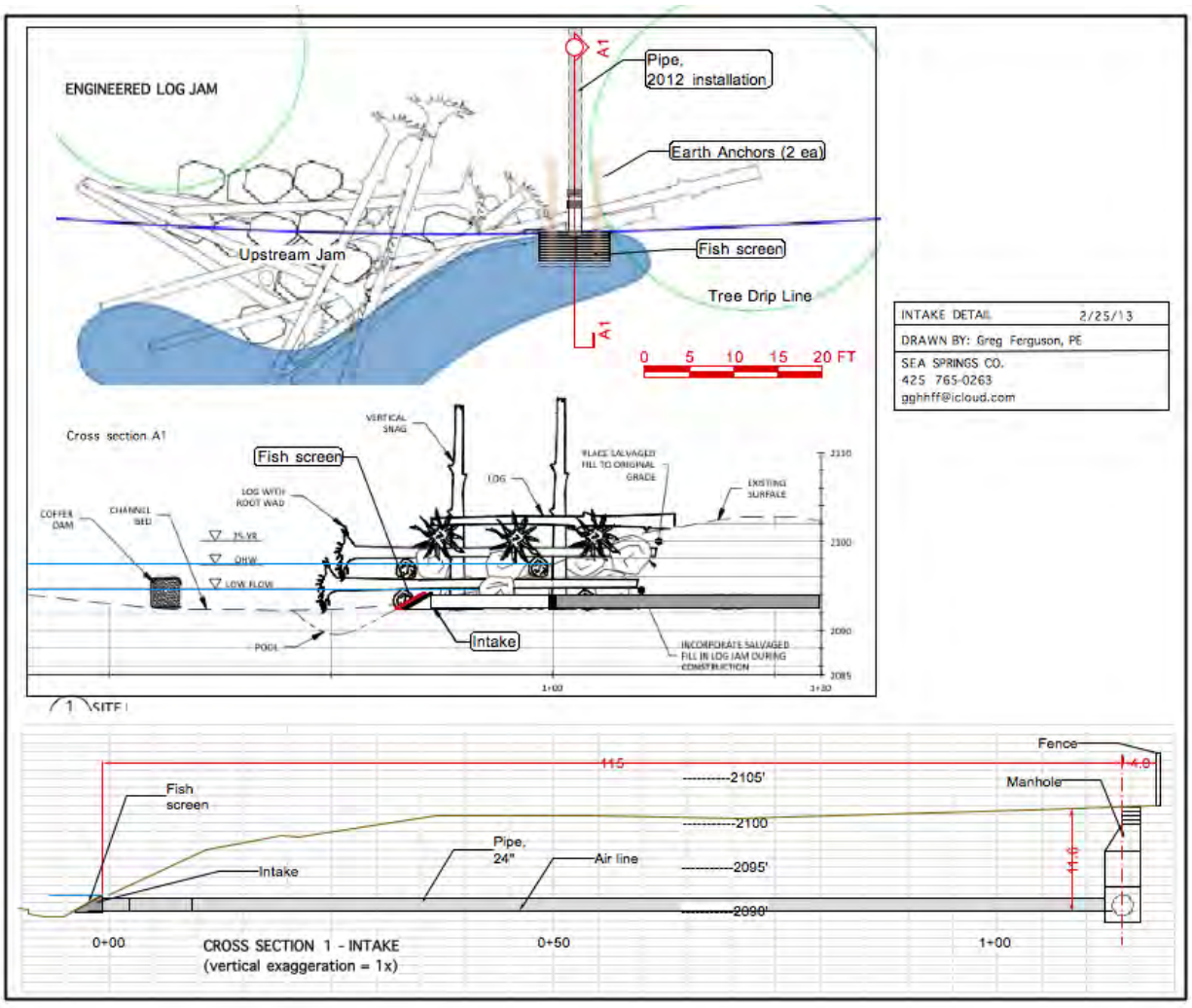


Figure 2-2. Surface Water Intake Design

Figure 2-3. Typical Water Intake Structure

Water Discharge

Figure 2-4 shows the design of the discharge system from the pond to the outlet pipe. The discharge outlet location would vary depending on the pond's location (Figure 2-1) but would be downstream of the pond to allow full operation during high water events. A 24-inch polyvinyl chloride (PVC) pipe would extend from the pond screen to the river. The pipe outlet would conform to the angle of the bank, and rock would be placed around it to prevent erosion when the pond levels are lowered. Fish would not be attracted to the discharge pipe because it would be at least 100 feet long and would have no light. In addition, the flow velocity in the pipe would be 1.5 feet per second, which is above the sustained swimming speed of salmon fingerlings, and there are no resting areas in the pipe.

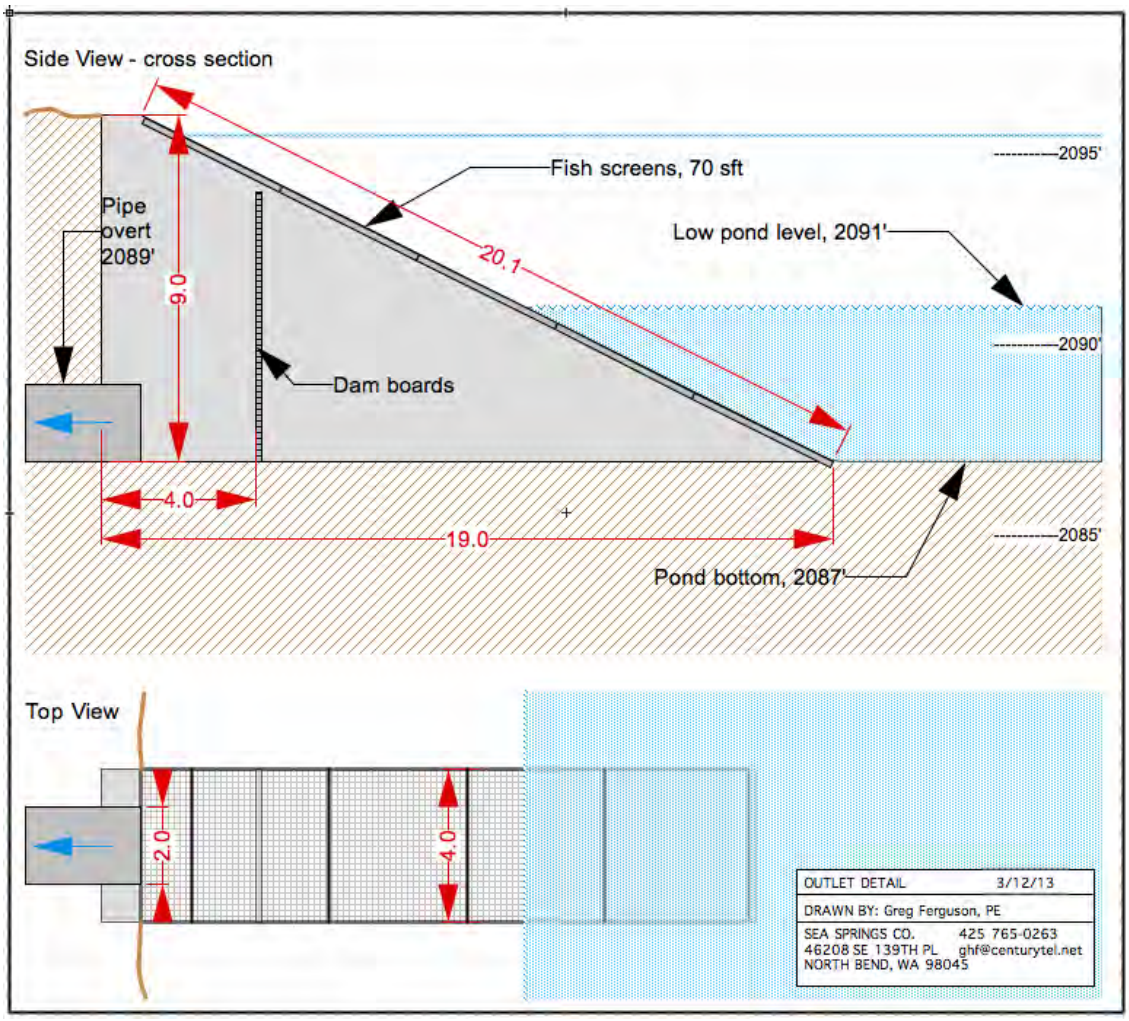


Figure 2-4. Water Discharge System Design

2.1.4 Groundwater Supply

Groundwater supplies irrigation water for Forest Service activities at the Eightmile Ranch. That groundwater could be used to reduce icing of the intake screen during the early acclimation period, if the system is activated (M. Liu, USFS, pers. comm., 7-2-14). It could also provide a short-term backup water supply in the event of a major failure of the surface water supply. In either case, the groundwater would not be needed for more than a few days each year.

Connecting a new pipeline from the existing Forest Service irrigation system to the water supply manhole would allow groundwater to be delivered to the intake. An 840-foot-long pipeline (3 inches in diameter) is proposed. It would be buried 3 feet deep or more and would have a valve to control flow. Figure 2-1 shows the proposed route.

The surface water line from the manhole to the intake would have a smaller diameter groundwater pipeline installed in the excavated trench during construction. The intake would have a groundwater distribution manifold[2] built behind the screens.

[2] A distribution manifold is a perforated pipe that spreads air bubbles across the face of the intake screen.

If the irrigation system cannot be used for de-icing, the most likely de-icing method would be for someone to knock ice off the intake by hand. If the start of acclimation is delayed due to low surface water flows (see Section 3.3), the need for de-icing becomes less likely.

2.1.5 PIT tag Detector

PIT (Passive Integrated Transponder) tags are inserted via a pre-loaded hypodermic needle into pre-smolts before they are moved to the acclimation pond from the rearing facility (Winthrop National Fish Hatchery [NFH], Willard NFH, or Cascade Fish Hatchery). The unique code associated with a specific PIT tag is used to track individual fish from the acclimation pond through their subsequent migratory journey towards the ocean and back to their natal streams.

A PIT tag detection system, which would be comprised of multiple antenna arrays, would be placed near the discharge pipe inside the screened outlet structure. It would not be visible due to its location within the outlet structure. Batteries and electronics would be installed each year on the pond bank near the pond outlet, would occupy about 20 square feet, and would be removed after the acclimation period. The containment boxes for the monitoring hardware would be covered with camouflage netting.

2.1.6 Emergency Aeration System

Sensors in the acclimation pond would monitor changes in water level and flow. When water levels drop, flows are reduced, which reduces the amount of oxygen being delivered to the pond. When values reach critical levels, alarm messages would be sent to program staff and an emergency aeration system would be started. The system would consist either of electrically operated mechanical aerators that float on the water surface or of submerged airstones[3] that bubble oxygen. The oxygen system would operate on compressed gas stored in cylinders on the site.

2.1.7 Electrical System

Power would be delivered from an existing power pole via a buried conduit to an area near the ponds and to the manhole (see Figure 2-1). The conduit would follow the existing site access road and would be 1,140 feet long and buried 3 feet deep. The power would help operate the fish tag (PIT tag) detectors, the compressed air system at the intake, and the emergency aeration system.

2.1.8 Access

Access to both proposed pond locations would be along the existing site access road (see Figure 2-1). The staging area for construction activities for both sites would be in the pasture directly to the south of the helispot, as shown in Figure 2-1.

Construction equipment access from the West Chewuch Road to the intake and discharge areas would follow an existing unpaved road (see Figure 2-1) and then would follow the proposed surface water supply pipeline route.

No new roads or road improvements are required for either pond location.

[3] "Airstones" are made of porous materials that allow oxygen or air to be diffused into water through the creation of a continuous stream of small bubbles.

2.1.9 Forest Plan Amendment

The Forest Service proposes a site-specific amendment to the Okanogan Forest Plan. Standard and Guideline 9-4 currently states that new diversions should not be authorized in rivers eligible for scenic designation under the Wild and Scenic Rivers Act. The following statement would be added to Standard and Guideline 9-4: *"A new diversion from the Chewuch River may be authorized for the purpose of supporting an acclimation pond at the Eightmile Ranch."* Section 3.10.4 discusses the effects of the proposed Forest Plan amendment on the river's eligibility under the Act.

2.2 Location 1

2.2.1 Design Details

Figure 2-5 is a schematic drawing showing design details for a pond at Location 1.

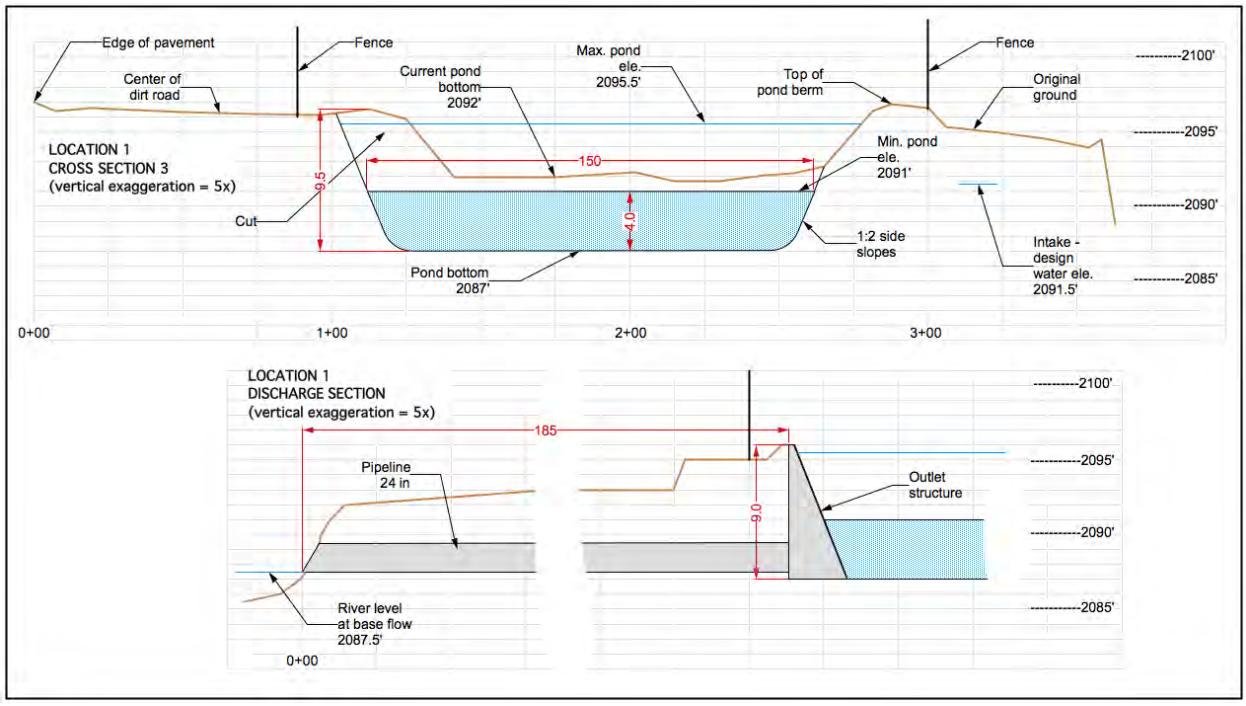


Figure 2-5. Location 1 Pond Design

The irregularly shaped pond would be approximately 170 feet by 120 feet at maximum depth. The depth would vary from 4 to 9.5 feet. The pond would occupy approximately 14,800 square feet (approximately a third of an acre); the water surface area would fluctuate with the pond depth.

The surface water supply pipeline would be 1,200 feet long; the discharge pipeline would be 185 feet long for a total surface water pipeline length of 1,385 feet.

A pond at this location would minimize impacts to ranch operations and would limit the pond's visibility from West Chewuch Road. However, the pond would require removal of earth from a wetland (delineated by the red line in Figure 2-1), and the water supply and discharge pipelines to and from the pond would pass through part of that wetland's buffer.

2.2.2 Site-Specific Mitigation Measures

In addition to the Design Criteria specified in Section 2.5, the following measures specific to Location 1 are proposed.

- Any disturbed areas in wetlands that are not part of the pond would be re-vegetated with wetland plants as specified in the re-vegetation plan (Appendix 1).
- Wetland soils would be stockpiled in pond berms on the site for use in future wetland restoration efforts (see "Site Reclamation" in Section 2.5.11).
- Other specific mitigation measures could be required as part of a Section 404 permit from the U.S. Army Corps of Engineers.

2.3 Location 2

2.3.1 Design Details

Figure 2-6 is a schematic drawing showing design details for a pond at Location 2. Like Location 1, this location minimizes interference with ranch operations due to its location away from the ranch's fenced pasture; however, unlike Location 1, it is outside wetlands and wetland buffers.

The pond would be 190 feet by 100 feet at its maximum depth. During acclimation, the pond would fluctuate between 4 and 8 feet deep. The pond would occupy about 15,000 square feet (approximately a third of an acre).

The intake and discharge pipelines for Location 2 would be 1,370 feet and 110 feet long respectively. At a total of 1,480 feet of surface water pipeline, this alternative requires more surface water pipeline than Location 1.

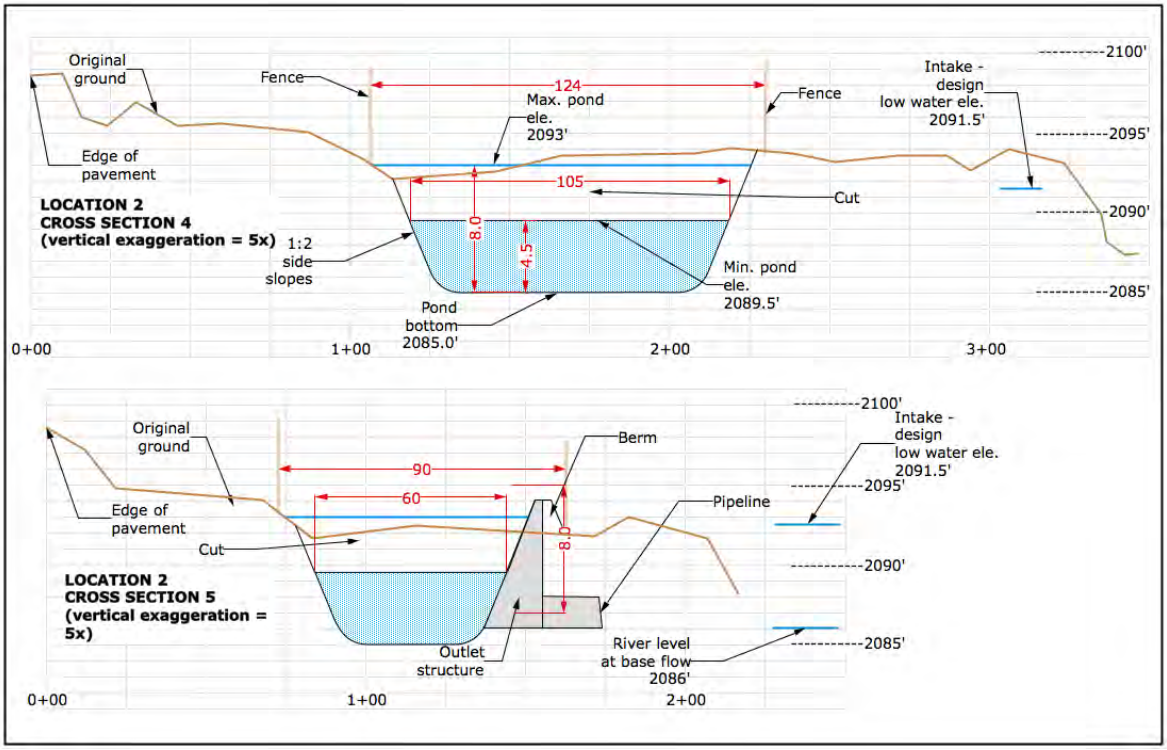


Figure 2-6. Location 2 Pond Design

2.3.2 Mitigation Measures

No additional mitigation measures other than those listed in Section 2.1 and in the Design Criteria in Section 2.5 are proposed for Location 2.

2.4 Construction and Operations Activities

2.4.1 Duration and Season of Construction Activities

Construction is expected to take five months. In-water work at the intake and discharge would be limited to the July 1 - 31 period to avoid impacts to incubating steelhead and spawning spring Chinook salmon; an expanded period for in-water work might be possible if approved by WDFW. In-water work requires keeping the work area isolated from the river's flow. Methods to do so are described under "Dewatering" in Section 2.5.4. There are no timing restrictions for upland work, but work would be done in coordination with Forest Service ranch operations. Specific construction methods are described throughout Section 2.5.

2.4.2 Activities During Acclimation

Coho pre-smolts would be trucked to the acclimation site in mid-March or later depending on river conditions. Yakama Nation staff would feed the coho daily, protect the fish from predation, and monitor coho releases. Coho would be fed 1 to 3 times each day (10-15 minutes per feeding). Predation control would include non-lethal deterrence of predators, primarily accomplished by frequent human presence on the site during peak predation periods (that is, near dawn and dusk). Coho smolts would be released by removing the pond fish screens in early May or when a YN biologist determines they are ready to migrate. It may take up to one month for all of the fish to volitionally migrate from the pond. Release monitoring would include daily maintenance of the PIT tag detection system.

During the acclimation period, the intake screens would be checked for debris at least daily and more frequently during high water events. The annual installation of the screens before acclimation begins would take less than a day.

2.5 Design Criteria

The following subsections list specific measures that would be implemented during project design, construction, and operation. The measures that would be taken to reclaim the site after it is no longer needed also are listed.

2.5.1 General Design Criteria

- Project elements, including the intake structure and fencing, that might be visible from the Chewuch River (a candidate Wild and Scenic River) would be designed so they do not intrude on river users' experience of a natural environment or degrade conditions that make the river eligible for the Wild and Scenic River system (see Sections 2.1 above for details of designs, and Appendices 1and 2 for details of vegetation planting).
- Project elements would be designed and sited to minimize views of the facility from the West Chewuch Road.
- The pond would have an irregular shape and native vegetation, boulders, and natural materials would be used to screen it and the surrounding fence from viewers on West Chewuch Road (Forest Road 5100), the ranch administrative site, and the Chewuch River.

- The fence would be vinyl-coated steel with a 2-inch by 2-inch mesh in a dark earth-toned color so that it would be less visible from viewpoints such as West Chewuch Road or the river during all seasons of the year.
- The water intake pipeline would be screened consistent with the current NMFS and WDFW screening criteria (NMFS 2008; RCW 77.57.010 and RCW 77.57.070). The screen would remain in place and functioning properly whenever water is withdrawn from the river.
- Project components that require ground disturbance would be located to avoid or minimize impacts to trees and shrubs.

2.5.2 General Construction Criteria

- Construction zones, staging areas, access routes, and vegetation clearing limits would be clearly marked, and construction personnel would be informed of those areas before any ground-disturbing activity begins.
- The terms and conditions attached to specific permits would be met. In addition to the Special Use Permit from the Forest Service, those permits could include but are not limited to Biological Opinions from USFWS and NMFS, the Hydraulic Project Approval (HPA) from the State of Washington, a Section 404 wetland development permit from the U.S. Army Corps of Engineers, a Shorelines Development Permit from Okanogan County, and a water right and a water quality certification from Washington Department of Ecology.
- Timing and methods of construction would be coordinated with resource agencies to minimize disturbance to special-status fish species and life-stages.
- To avoid interactions between bears and humans, the contractor would not store food, garbage, or other bear attractants. Food and garbage would be attended during the day and hauled off the site at the end of each day.
- To avoid or minimize noise during construction, all activity would be limited to normal workday hours of 8:00 a.m. to 5:00 p.m., Monday through Friday.
- Rock, gravel, or sand sources would be inspected for invasive plants before use. Infested material would be treated and judged to be weed-free by the Forest Service weed specialist before it is used.
- Unless specified otherwise (e.g., if stockpiling wetland soils), excess excavated soils would be removed from the site. Two locations are being considered: Cascade Sand and Gravel in Winthrop and Forest Service gravel pits. The construction contractor would be responsible for disposal at a location that meets the conditions of all permits.
- Upon completion of all construction activities, all temporary structures, devices, materials or equipment would be completely removed from the site and all excess spoils and/or waste materials properly disposed of in compliance with federal, state, and local regulations.
- Large wood, native vegetation, weed-free topsoil or native material displaced during construction would be stockpiled for use in site restoration if practicable.
- Construction would be monitored by a professional archaeologist to ensure that the existing historic site (a Civilian Conservation Corps camp) is avoided and to ensure that if any currently unknown subsurface cultural materials are unearthed, work is stopped until their significance is determined.

2.5.3 Erosion Control

- In areas where the bank would be disturbed, before starting work, a temporary filter fabric fence would be installed to prevent sediment from entering the stream. Accumulated sediments would be removed during the construction period and before removing the filter fence once work is completed.
- The type of filter fabric used would be based on soil conditions at the site. For soils that pass U.S. standard sieve 200, the equivalent opening size (EOS) would be selected to retain 85% of the soil. For all other soil types, the EOS would be no larger than U.S. standard sieve 100.
- For standard-strength filter fabric, a wire mesh support fence would be fastened securely to the upslope side of the posts and the fabric stapled or wired to the mesh. If extra-strength fabric is used, the wire mesh fence may be eliminated.
- All temporary erosion controls would be in place and appropriately installed downslope of applicable project activities until site restoration is complete.
- The sediment plume created by any work below the ordinary high water mark (OHWM) of the adjacent river, stream, or pond would not exceed background turbidity at least 300 feet downstream of the project location or as specified in the Hydraulic Project Approval. If these criteria are exceeded, work would be suspended until the criteria are met.
- If instream work is approved to take place outside the normal work window of July 1 - 31 and after spring chinook spawning occurs, additional measures would be used to ensure nearby redds would not be exposed to fine sediment.
    - Redd surveys would identify the number and location of chinook redds adjacent or immediately downstream (300 feet downstream of disturbance site).
    - If any redds are present during the instream work, silt fences would be installed above the redds to protect them from suspended sediment prior to any instream work.

2.5.4 Dewatering

- The in-water construction area would be isolated from active flow by placing cofferdams at the inlet and outlet. Cofferdams would consist of gravel-filled bags and plastic sheeting to prevent water and fish from entering the work area.
- Yakama Nation fish biologists would capture and safely move fish from the impounded area as it becomes de-watered. Yakama Nation would have fish-capture and transportation equipment ready and on the job site. Captured fish would be immediately and safely transferred to free-flowing water downstream of the project site.
- The device used to divert water from the river during construction would be equipped with a fish guard to prevent passage of fish into the diversion device pursuant to RCW 77.57.010 and 77.57.070. The pump intake would be screened with 3/32-inch mesh to prevent immature salmon or steelhead fry (20-30 millimeters long) from entering the system. The screened intake would consist of a facility with enough surface area to ensure that the velocity through the screen is less than 0.4 feet per second. Screen maintenance would be adequate to prevent injury or entrapment to juvenile fish, and the screen would remain in place whenever water is withdrawn from the stream through the pump intake.

- If a pump is used, water pumped from within the work area would be routed to an upland area approved by the Forest Service to allow removal of fine sediment and to allow water to infiltrate back into the groundwater table.
- Stream flow and weather conditions would be monitored daily for events that may cause extremely high flows. Before such events occur, all equipment would be removed from the in-water work site until flows have abated.
- All work below the OHWM would be completed during the in-water work period as specified in the Hydraulic Permit Approval to minimize sedimentation potential and impacts to incubating steelhead and spawning spring Chinook salmon.

2.5.5 Bank Stabilization

- Bank stabilization material would be clean, angular rock, certified weed-free, and would be installed to withstand 100-year peak flows. Stream gravels or other round cobbles would not be used as exterior armor. Riprap would not be used.
- Bank stabilization would be limited to the extent necessary to preclude channel erosion from the river.
- Native rock removed during installation of the discharge pipe would be replaced around the pipe.

2.5.6 Water Quality Protection

- The contractor would develop a site-specific Spill Prevention Control and Countermeasure Plan (SPCC Plan) that includes: site plan and narrative describing methods of erosion and sediment control; methods for confining, removing, and disposing of excess construction materials and measures for equipment washout facilities; a spill containment plan; and measures to reduce or recycle hazardous and non-hazardous wastes.
- The SPCC plan would include the following information: notification procedures, specific cleanup and disposal instructions for different products, quick response containment and cleanup measures, proposed methods of disposal of spilled materials, and employee training on spill containment.
- Materials for containment and cleanup would be available onsite during pre-construction, construction and restoration phases of the project.
- Equipment used to work in the water that operates with hydraulic fluid would use only fluids certified as non-toxic to aquatic organisms.
- Vehicle staging, cleaning, maintenance, refueling, and fuel storage would be located a minimum of 150 feet from the river.
- When heavy equipment is used, the equipment selected would have the least adverse effect on the environment, e.g., would be minimally sized, with low ground pressure.
- Equipment used for this project would be free of external petroleum-based products. Accumulations of soil or debris would be removed from the drive mechanisms (wheels, tires, tracks, etc.) and undercarriage of equipment prior to its use within 150 feet of the acclimation pond or river. Equipment would be checked daily for leaks and any necessary repairs completed before commencing work activities.

- All stationary power equipment such as generators, cranes, or stationary drilling equipment operated within 150 feet of the river would be diapered to prevent leaks unless suitable containment is provided to prevent potential spills from entering the water.
- Extreme care would be taken to ensure that no petroleum products, hydraulic fluid, fresh cement, sediments, sediment-laden water, chemicals, or any other toxic or deleterious materials are allowed to enter or leach into the river or wetlands.
- No concrete or fresh cement or grout would be poured directly within, allowed to fall or leach into, or wasted within the area below the OHWM or wetted perimeter of the river or acclimation pond.
- If at any time during or as a result of project activities fish are observed in distress, a fish kill occurs, or water quality problems develop (including equipment leaks or spills), the Washington Military Department Emergency Management Division and the designated WDFW Area Habitat Biologist would be immediately notified. Work would not resume until WDFW approves. WDFW may require additional measures to mitigate the impacts.

2.5.7 Air Quality

Dust abatement measures would be used as necessary during construction to minimize the effects of dust on users of West Chewuch Road and the Chewuch River and on operations at the ranch site. Measures would be implemented considering soil type, equipment used, prevailing wind direction, and the effects of other erosion and sediment control measures. Specific measures include the following:

- Work would be sequenced and scheduled to reduce the amount of bare soil exposed to wind erosion.
- Dust-abatement additives and stabilization chemicals (typically magnesium chloride, calcium chloride salts, or ligninsulfonate) would not be applied within at least 25 feet of the river channel and would be applied to minimize the likelihood that they would enter the river.
- Petroleum-based products would not be used for dust abatement.
- Application of dust abatement chemicals would be avoided during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to the river.
- Spill containment equipment would be available during application of dust abatement chemicals.
- Motorized equipment used for construction and operation would be maintained to minimize emissions.

2.5.8 Vegetation Protection

- The project would adhere to Forest Service management recommendations[4] to protect mountain lady's slipper, the one special-status plant that was detected in the project area.
    - Current microclimate conditions of the habitat would be maintained by ensuring that the overstory canopy coverage is at 60 percent or more to prevent increased sunlight to the site.

[4] From *Management Recommendations in IM-OR-99-027 - Vascular Plants for Cypripedium montanum.*

  - Direct mechanical damage to plants or changes in soil moisture and temperature or the nature of the duff layer would be avoided.
  - Before equipment access and earth disturbance begins, a 20-foot-diameter buffer would be placed around the mountain-lady's slipper plants identified during the on-site survey, using a barrier such as high-visibility construction fencing or similar material.
- Forest Service botanists would be involved before and during project implementation to ensure management recommendations are being met.
- All heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) used for project construction and operation would be cleaned before entering the Eightmile acclimation site to prevent the spread of invasive plants and weeds.
- Machinery entering the work site would not drive through the population of diffuse knapweed (a noxious weed) identified to the north and west of the project area.

2.5.9 Re-vegetation

A detailed re-vegetation plan has been developed for each alternative pond location (Appendices 1 and 2). Depending on the pond location chosen, wetland mitigation could be required. Re-vegetation would be consistent with the riparian planting project previously implemented by the Yakama Nation at this site (BPA Fish and Wildlife Project 2009-003-00). Restoration of disturbed areas would be coordinated with Yakama Nation habitat division personnel and the Forest Service botanist. The plans include methods to prevent and treat invasive plant species.

Site restoration and plantings would conform to the following:

- Damaged banks would be restored to a natural slope pattern and profile that is suitable for establishment of permanent woody vegetation.
- Disturbed areas and soils deposition areas would be graded and covered with at least 2 inches of compost.
- Measures including vehicle washing and replanting with native plants would reduce the potential for spreading invasive plants (see Chapter 3, Section 3.7 of this EA). Mulch used during construction and re-vegetation would be certified weed-free by the State or by the Forest Service weed specialist.
- To prevent future erosion and the invasion of invasive plants, the disturbed areas would be seeded with a native erosion control grass seed mix or other native vegetation that provides wildlife benefit and erosion control.
- The pasture disturbed during excavation for the pipelines would be replanted with a seed mix approved by the Forest Service's Ranch Manager.
- Any seeding would be monitored for a period of at least three years to ensure germination and establishment and reseeded in areas when needed.
- Any plantings would be protected from deer, beaver, rodents, etc., regularly watered and weeded, and properly maintained until established. Plantings would be replaced as necessary for a period of at least three years to achieve a minimum of 80% survival by the end of the third growing season.

2.5.10 Operations and Maintenance

- The operation and maintenance of the water intake would conform to NMFS and WDFW screening guidelines and the water rights of the permittee. Yakama Nation staff would also operate and maintain the screens consistent with the manufacturer's instructions to prevent injury to or entrapment of fish.
- The annual installation of screens and any emergency maintenance and repair work would be done with handheld tools.
- Large woody debris that must be removed from the intake would be placed in the river downstream from the diversion.
- All maintenance work would be done with care to avoid harm to fish and minimize discharge of sediment to the stream.
- To meet minimum instream flows during extreme low-flow periods (Section 3.3), Yakama Nation would take one or more of the following measures:
  - Delay the start of acclimation until Chewuch River flows increase to the point where a 4.6 cfs withdrawal would not reduce flows to below minimum instream flows.
  - Implement methods to re-use water, including the use of portable pumps to re-circulate the pond water.
  - Reduce water needs by acclimating fewer fish.
  - Reduce water withdrawals until water flows increase.
- Annual reports to NMFS and USFWS would describe any mortality to ESA-listed species if the number is above the allowable take levels described in the Biological Opinions from NMFS and USFWS.
- Only non-lethal predator hazing would occur on the site.
- Fish food would not be stored onsite to minimize the potential to attract bears.
- To the extent possible, vegetation would be maintained to screen the pond and the security fence from the road and the river.

2.5.11 Site Reclamation

When the acclimation pond is no longer needed, if the Special Use Permit expires and is not renewed, or if the permit is terminated, it is expected that the Forest Service would require the site to be returned as closely as possible to its original condition. A detailed reclamation plan would be developed at that time, which could be 20 years or more in the future; however, Appendices 1 and 2 describe a potential reclamation plan for each pond location. The following lists basic reclamation criteria.

- The steel intake structure would be removed and the intake pipe near the intake would be filled with rock. The outlet pipe would also be plugged with rock.
- The acclimation pond would be refilled. If Location 2 is selected, the pond would be filled to the current ground level and would be seeded with grasses that match the surrounding vegetation. For Location 1, the area within the constructed pond boundaries would be filled and restored to the original contours. To the extent possible, the restored surface of the pond would consist of the wetland soils that were stockpiled in the pond berms. The pond bottom would be re-vegetated with wetland plants. The reclamation of Location 1 would expand the size of the current wetland.

- Buried pipelines and the electrical conduit would remain buried.
- Other constructed elements, such as fencing and the manhole, would be removed and holes filled and re-vegetated.
- Native plants would be used for re-vegetation.

2.6 Costs of the Proposed Action

The Final EIS for the Mid-Columbia Coho Restoration Program evaluated costs of construction and operation of all proposed acclimation sites and a new hatchery through approximately 2028 (USDOE/BPA 2012). Capital costs for the entire program in two basins (Wenatchee and Methow) were expected to total $6,730,000, including land purchase and facility construction (USDOE/BPA 2012, Section 2.2.4). Costs of construction of a new pond and associated facilities at the Eightmile Ranch site are estimated to be $1,027,008 in 2015 dollars. Because only a few of the proposed 24 acclimation sites in the Methow and Wenatchee basins require construction, and because at least two of those previously proposed that required construction have now been eliminated from the program (Chikamin and Minnow in the Wenatchee basin), the capital costs for new facilities at Eightmile Ranch are not expected to increase the total predicted capital costs for the program that BPA decided to fund in the Record of Decision for the overall program (BPA 2012).

Operational expenses include costs of operating and maintaining the facilities as well as for monitoring and evaluation, fish tagging, and rearing. BPA does not fund all operating costs; contributions from public utility districts fund approximately 27% of the total operating costs and are predicted to increase to 36% in out years. Peak annual operating costs for the entire program in the Methow basin, which includes up to 12 acclimation sites, are estimated to be $1,777,778 (USDOE/BPA 2012, Section 2.2.4). Maximum operating costs would be incurred at the initial stages of the program, when the maximum number of fish would be released, and would decrease over time as the numbers of fish released decreases. Operational costs for this site are not expected to change the overall operating cost estimate for the program.

BPA is a non-profit self-funded federal agency; that is, although BPA is part of the U.S. Department of Energy, it covers its own costs, including the costs of its fish and wildlife program, by selling its products and services. BPA markets wholesale electrical power from 31 federal hydro projects in the Columbia River Basin and several nonfederal power plants.

2.7 No Action Alternative

Under the No Action Alternative, the Forest Service would not amend the Forest Plan or grant a Special Use Permit for an acclimation pond at the Eightmile Ranch site, and BPA would not fund construction and operation of facilities at that site. Land use and ranch operations would not change if the proposed project is not constructed.

In the event the No Action Alternative is selected, BPA and the Yakama Nation might propose an acclimation pond at another location somewhere in the Chewuch River subbasin if one could be found; however, to date, no suitable sites have been found after extensive searches.

2.8 Alternative Considered and Eliminated from Detailed Evaluation

During development of the alternatives, the Forest Service, BPA, and Yakama Nation considered a pond location closer to West Chewuch Road, known as Location A, as shown in Figure 2-7. Forest Service use of the area by helicopters and other fire-fighting equipment was considered in the location and design, as was minimizing views of the pond from West Chewuch Road. Although the pond was located to avoid interference with ranch operations as much as possible, it would have removed some pasture. The site was eliminated from further analysis in the EA because it likely would have adversely affected a known historical Civilian Conservation Corps (CCC) site and would have limited ranch operations more than other pond locations.

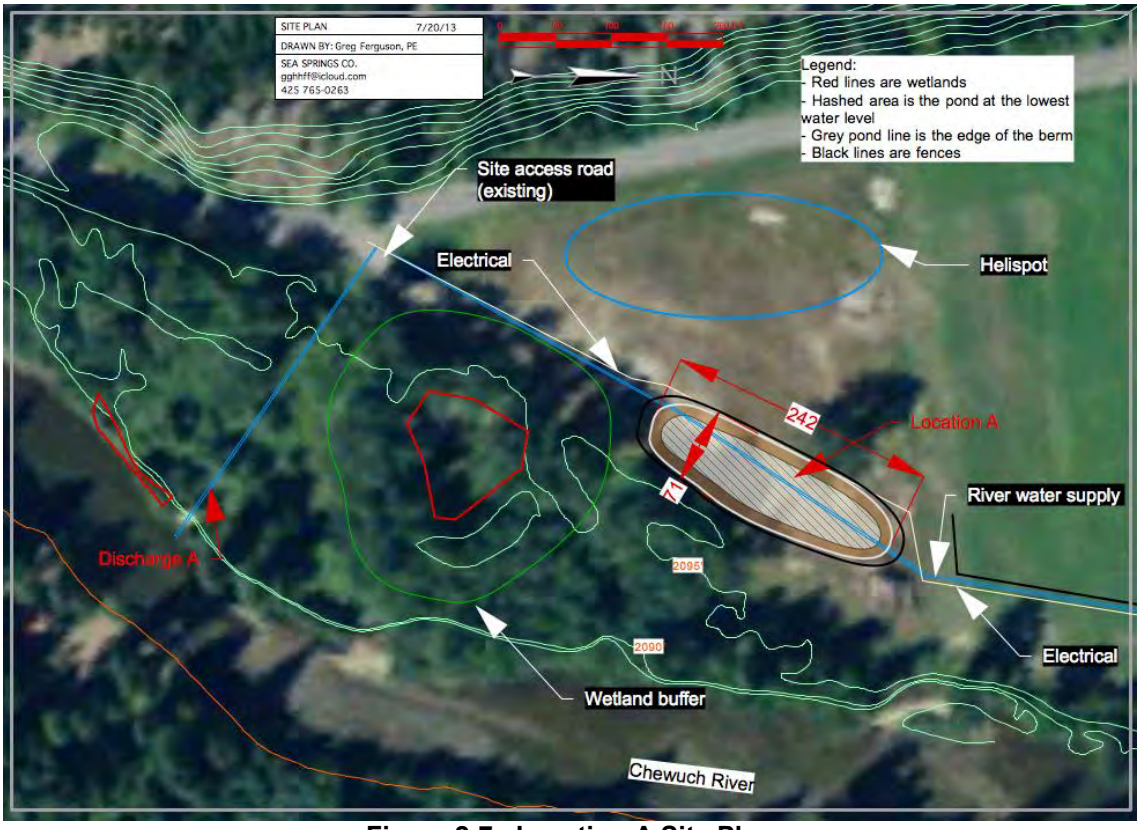


Figure 2-7. Location A Site Plan

2.9 Comparison of Alternatives

Table 2-1 compares the Proposed Action and the No Action Alternative in terms of how well they meet the purposes defined in Chapter 1, Section 1.2. A discussion follows this table.

Table 2-1. Comparison of the Proposed Action and the No Action Alternative to Purposes

Purpose	Proposed Action	No Action
BPA Purposes		
Support efforts to mitigate for effects of the FCRPS on fish and wildlife in the Columbia River basin pursuant to the Northwest Power Act	Both locations under the Proposed Action would support the long-term goal of a program designated as a high-priority mitigation project in the Council's Fish and Wildlife Program.	The Mid-Columbia Coho program would continue, but the likelihood of meeting overall program goals would be less likely.
Assist in carrying out commitments related to proposed hatchery actions that are contained in the 2008 Columbia Basin Fish Accords Memorandum of Agreement with the Yakama Nation and others.	Providing funding for this acclimation pond at either location would help to meet the Fish Accords commitment.	BPA would continue to fund the Mid-Columbia Coho program as agreed to in the Accords and in the EIS Record of Decision (BPA 2012) but would not fund an acclimation facility at the Eightmile Ranch site.
Implement BPA's Fish and Wildlife Implementation Plan Environmental Impact Statement and Record of Decision policy direction which calls for protecting weak stocks, like the Upper Columbia steelhead and spring Chinook, while sustaining overall populations of fish for their economic and cultural value (BPA 2003).	The Proposed Action at either location would contribute to establishing a self-sustaining population of coho in the Chewuch River subbasin, which is of cultural value and may provide economic benefits while at the same time protecting ESA-listed fish.	While not funding this acclimation pond would eliminate any potential to affect depressed fish stocks in the vicinity, it would reduce the likelihood of establishing a self-sustaining population of coho in the Chewuch portion of the Methow basin (which could provide a biological benefit for those same depressed stocks), and possibly in the Methow basin as a whole, thus losing the ecological, economic, and cultural values of coho reintroduction.
Forest Service Purpose		
Alternatives should be consistent with Forest Service policies and plans, including the Okanogan National Forest Land and Resource Management Plan and EIS of 1989 and amendments.	The Proposed Action would be consistent with the Okanogan Forest Plan of 1989 and amendments, but Location 1 would be slightly less consistent with Visual Quality Objectives for the Eightmile Ranch area than Location 2 (Section 3.11).	The No Action Alternative would not change the current conditions at Eightmile Ranch, so consistency with the Okanogan Forest Plan and amendments would be maintained.
BPA and Forest Service Purpose		
Minimize harm to natural and human resources, including species listed under the Endangered Species Act	Proposed mitigation measures would minimize harm to natural and human resources, although Location 2 would do so better than Location 1, due to its lack of impact on wetlands (see Section 3.5). Approvals by and reporting to regulatory agencies would minimize the risk of adverse effects to ESA-listed species at either location.	With no construction of new facilities, natural and human resources would not be adversely affected. Low numbers of naturally produced coho could reduce the risk of adverse effects to ESA-listed species but also would not provide potential ecological benefits (USDOE/BPA 2012).

The Proposed Action would contribute to meeting the Yakama Nation's long-term goal of restoring coho populations throughout the Methow basin, and would meet BPA purposes related to the Northwest Power Act, the 2008 Columbia Basin Accords, and its Fish and Wildlife Implementation Plan policy decision. The Chewuch is a major subbasin of the Methow basin, and an acclimation pond at Eightmile Ranch would have the capacity to acclimate sufficient numbers of coho smolts to provide adequate adult returns to meet the overall program's goal of broad distribution of coho throughout the basin. The Chewuch subbasin has higher proposed release numbers compared to other subbasins in the Methow basin, and therefore might be key to the success of the coho restoration program in the Methow.

The No Action Alternative would hinder the implementation of the overall coho restoration program in the Methow basin because the program would not meet production goals for the Chewuch, which is a key subbasin in the Methow basin. No other viable sites appear to be available in this subbasin except for the existing Chewuch Acclimation Facility, which is not large enough for the numbers of coho to be released in the Chewuch. While it is possible that another site could be found in the Chewuch subbasin, exhaustive searches have not been successful, and previously identified sites have been eliminated for various reasons (insufficient water, unwilling landowners, and/or too small to acclimate the numbers of smolts projected). Both the Chewuch Acclimation Facility and Eightmile Acclimation site would be needed to accommodate the release numbers.

If Yakama Nation does not build an acclimation site at Eightmile Ranch, there would be no construction or operations impacts to natural or human resources at this site. In the event a replacement site is found, similar types of impacts are likely, but different species and resources could be affected and would be evaluated as part of a separate environmental compliance process.

Table 2-2 summarizes the environmental effects that are discussed in detail in Chapter 3.

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

Impact	Proposed Action Location 1	Proposed Action Location 2	No Action Alternative
Effects on land use	Loss of 47,200 sq. ft. (1.1 acre), or 2% of the Ranch's pasture, for one season, a low impact.	Loss of 49,000 sq. ft. (1.1 acre), or 2% of the Ranch's pasture, for one season, a low impact.	No change in current conditions.
Effect on soil productivity	Impact on productivity in soil classified as prime farmland would be low because effects of excavation would be temporary and mitigated after construction.	Same as Location 1.	No change in current conditions.
Effects of surface water with-drawals on surface water quantity and rights	Minor reduction in river flows (4.6 cubic feet per second [cfs]) in the 1,070-ft. reach between pond intake and discharge during the spring acclimation period. Downstream users would not be affected because the amount of withdrawal is returned to river and no other users withdraw from the affected reach. Adaptive measures would maintain minimum instream flows in dry years.	Minor reduction in river flows (4.6 cfs) in the 1,380-ft.reach between pond intake and discharge during the spring acclimation period. Downstream users would not be affected because the amount of withdrawal is returned to river and no other users withdraw from the affected reach. Adaptive measures would maintain minimum instream flows in dry years.	No change from existing conditions because no new withdrawals would be proposed.
Effects of water withdrawals on groundwater supply	No effect, because withdrawals, if approved, would be for only a few days in early spring, if needed for de-icing, when the USFS irrigation system is not in use.	Same as Location 1.	No change from existing conditions because no withdrawal would be made.
Effects on water quality from facility discharges	Low impacts from phosphorus in effluent from new pond, but modeling shows that the maximum possible impact would be undetectable downstream.	Same as Location 1.	No change from existing conditions because no new discharges are proposed.
Effects on wetlands	Replacement of 8,020 square feet (0.18 acre) of palustrine forested, seasonally-flooded wetland with open water for the duration of the project, a moderate to high impact.	No construction would take place in wetlands, so wetlands or their buffers would not be affected.	No change in current conditions.
Changes to floodplain function	Flood elevations could be slightly lowered due to removal of excavated materials from the floodplain.	Same as Location 1.	No change in current conditions.
Effects on USFS sensitive plant	Avoidance and canopy protection measures would ensure no impact to mountain lady's slipper.	Same as Location 1, except identified plant locations are further from Location 2.	No change in current conditions.
Loss of large trees	13 large trees (several cottonwoods and a few ponderosa pines) would be removed, a low impact due to the abundance of similar species.	26 large trees (cottonwoods and ponderosa pines) would be removed, a greater but low impact due to the abundance of similar species.	No change to current conditions.
Potential spread of invasive plants	Low potential to spread invasive plants and noxious weeds due to low numbers in project area and mitigation measures.	Same as Location 1	No change to current conditions.
Sedimentation effects on ESA-listed fish	Low effects on ESA-listed fish and critical habitat from temporary sedimentation due to excavation and construction: best management practices would be used for erosion control.	Same as Location 1.	No sedimentation effects because no new facilities would be constructed.

Impact	Proposed Action Location 1	Proposed Action Location 2	No Action Alternative
Effects of surface water withdrawal on ESA-listed and other fish	A 4.6 cfs withdrawal during low flows in the Chewuch River would have low effects on habitat based on modeling for spring Chinook, steelhead, and bull trout; water use would be managed to ensure minimum instream flows to protect fish passage are maintained. Water intake system would follow NMFS 2008 guidelines to reduce potential to entrain all fish species.	Same as Location 1.	No change from current conditions because no new surface water withdrawals would be made.
Habitat reductions for ESA-listed wildlife	None.	None.	No change in current conditions.
Habitat reductions for other sensitive wildlife (Section 3.9)	Minor reductions (0.13 - 0.96 acre, depending on the species), a low impact due to the abundance of similar habitat in the area.	Minor reductions (0.5 - 1.09 acres, depending on the species), a low impact due to the abundance of similar habitat in the area.	No change in current conditions.
Disturbance to wildlife	Construction noise could cause certain species to avoid the site for up to 5 months, June-October of 2015, a low impact. Operations would not noticeably disturb wildlife because the site currently experiences human activity.	Same as Location 1.	No change in current conditions.
Effects on potential Wild and Scenic River status	Design criteria would ensure no effect on values making the Chewuch River eligible for Scenic status.	Same as Location 1.	No change in current conditions.
Effects on aesthetic/visual quality	Design criteria would ensure little noticeable change to aesthetic and visual qualities as viewed from West Chewuch Road or the river, a low impact.	Design criteria would ensure little noticeable change to aesthetic and visual qualities as viewed from West Chewuch Road or the river, although this location would meet USFS Visual Quality Objectives slightly better than Location 1.	No change in current conditions.
Effects on recreation	No interference with current recreation uses.	Same as Location 1.	No change in current conditions.
Effects on cultural resources	Adverse effects on known historical site unlikely but construction would be monitored by a cultural resources specialist.	Same as Location 1.	No effect.
Noise effects	Intermittent construction noise could be noticed by recreational users of the area during summer of 2015, a low impact. Low increase in noise at site from spring acclimation activity.	Same as Location 1.	No change in current conditions.
Effects on air quality	Minor short-term increases in dust during summer/fall of 2015 from construction activities; dust abatement measures would ensure a low impact.	Same as Location 1.	No change in current conditions.
Socioeconomic effects	Low, except for cultural benefits of restored coho populations, based on analysis for entire program in Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012).	Same as Location 1.	No change in current conditions.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

The proposed acclimation site is in Okanogan County, Washington, 10 miles north of the town of Winthrop, on the Okanogan-Wenatchee National Forest, Methow Valley Ranger District (Figure 1-1 in Chapter 1). The parcel, known as Eightmile Ranch, is adjacent to the Chewuch River in the southeast quarter of Township 36N, Range 21E, Sections 25 and 26.

This chapter describes the resources that could be affected by the two location alternatives, as shown in Figure 3-1, and the No Action Alternative. If both locations result in the same impacts to a particular resource, the impacts are described in the same subsection (e.g., Proposed Action, Locations 1 and 2). If impacts to the resource are different for each location, they are discussed separately.

In assessing the significance of project impacts from construction, operation, and maintenance activities, four impact levels were used—high, moderate, low, and no impact. High impacts could be considered significant impacts, if not mitigated, while moderate and low impacts are not. These impact levels are based on the considerations of context and intensity defined in Council on Environmental Quality regulations for implementing NEPA (40 Code of Federal Regulations 1508.27).

The Mid-Columbia Coho Restoration Program EIS analyzed the cumulative effects of the entire coho reintroduction program (USDOE/BPA 2012). No projects were identified specific to the Eightmile location that would contribute to cumulative effects in the project area or surrounding areas; therefore this EA incorporates the EIS analysis of cumulative effects of the full program by reference rather than re-analyzing the program-scale impacts.

3.1 Land Use

3.1.1 Information Sources

- Land and Resource Management Plan for the Okanogan National Forest (USDA/FS 1989), referred to in this document as the Okanogan Forest Plan.
- Northwest Forest Plan (USDA/FS and USDI/BLM 1994).

3.1.2 Analysis Area

The analysis area includes the entire Eightmile Ranch site.

3.1.3 Affected Environment

The 50-acre Eightmile Ranch is used by the Forest Service to corral and pasture horses and mules during the summer months and to raise hay for the animals. These areas are generally to the west of the blue river-water supply line shown in Figure 3-1. The ranch is irrigated from two groundwater wells, delivered through a pressurized wheel line system.

A parking area and tack building are located in the middle of the ranch, north of the area shown in Figure 3-1. A portion of the parking area is the Eightmile SnoPark, used by recreationists in both summer and winter. The ranch occasionally is used as a camp for firefighters when wildfires are burning in the vicinity. An established helispot (shown on Figure 3-1) is used for fire suppression or other helicopter-supported management activities.

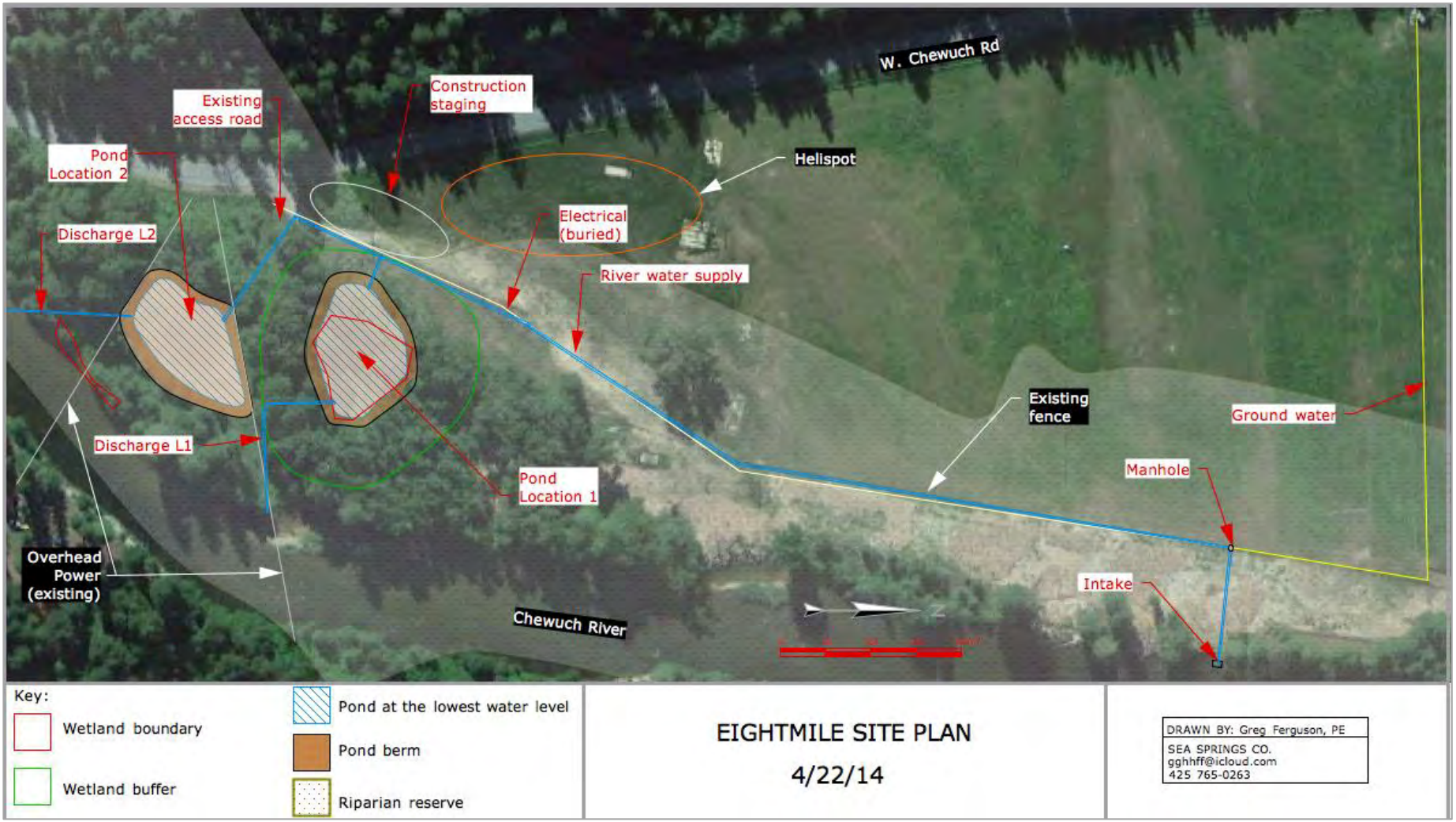


Figure 3-1. Eightmile Ranch Coho Acclimation Pond Project Elements and Alternative Locations

The site provides some wildlife habitat. BPA recently funded habitat improvements at the site to benefit both fish and wildlife (BPA Fish and Wildlife Project 2009-003-00). Effects of the Proposed Action on habitat are discussed in Sections 3.8 and 3.9

Two Northwest Forest Plan land allocation categories apply to the project area: the Matrix land use allocation (a multiple-use designation that applies to large areas of the Forest) and the Riparian Reserve land use allocation (Figure 3-1). Riparian Reserves are "areas along live and intermittent streams, wetlands, ponds, lakes… where riparian-dependent resources receive primary emphasis." The proposed acclimation pond sites are in Okanogan Forest Plan Management Area (MA) 5. MA 5 objectives are to provide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective of retention or partial retention.

3.1.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

Any effects to land use are limited to land uses on the ranch itself; no existing land uses beyond the ranch would be affected by project construction or operation.

Table 3-1 summarizes the amounts of certain resources that could be temporarily disturbed or permanently eliminated by each of the pond locations. The summary includes the amount of soil disturbed and areas of wetlands, pasture, and large trees (timber) that could be affected. Discussion of those impacts can be found under Soils (Section 3.2), Wetlands/Floodplains (Section 3.5) and Botany (Section 3.6). The table also includes the amount of disturbance that would take place below the Ordinary High Water Mark (OHWM). Details of those impacts are discussed in the Fish section (3.8). The Sno-Park would not be affected.

Except for the amount of pasture temporarily removed by the surface water supply pipe (Table 3-1), the effects on land use are the same for both alternative pond locations. The location of the 1,140-foot-long buried power line and the 840-foot-long groundwater supply line are the same for both pond sites. Excavation for these two project elements would temporarily remove 11,400 square feet and 12,600 square feet of pasture respectively.

The surface water supply line is 1,370 feet long for Location 2, 170 feet longer than the line to Location 1 due to its greater distance from the water intake (Figure 3-1). All pasture land disturbed during construction would be lost to use for one season. The total amount of pasture disturbed by excavation of the utility lines is approximately 1.1 acres for each location: 49,000 square feet for Location 2 compared to 47,200 square feet for Location 1. This amount is approximately 2% of the Ranch's pasture. Once the lines are in place, the disturbed areas would be replanted with a seed mix approved by the Forest Service's Ranch manager.

Table 3-1. Amount of resource disturbance by location and project element

	Location 1			Location 2		
	Length (ft.)	Area (sq. ft.)	Vol. (cu. yds.)	Length (ft.)	Area (sq. ft.)	Vol. (cu. yds.)
Intake						
Below OHW		200	74		200	74
Pasture		0	0		0	0
Timber		0	0		0	0
Total		200	74		200	74
Wetland		0			0	
Wetland buffer		0			0	
Temporary		40	60		40	60
Life of Project		160	14		160	14
Surface water supply						
Below OHW	0	0	0	0	0	0
Pasture	1,160	23,200	1,375	1,250	25,000	1,481
Timber	40	800	47	120	2,400	142
Total	1,200	24,000	1,422	1,370	27,400	1,624
Wetland		0			0	
Wetland buffer	40	800		0	0	
Temporary	1,200	24,000	1,422	1,370	27,400	1,624
Permanent		0	0		0	0
Groundwater supply						
Below OHW	0	0	0	0	0	0
Pasture	840	12,600	187	840	12,600	187
Timber	0	0	0	0	0	0
Total	840	12,600	187	840	12,600	187
Wetland		0		0	0	0
Wetland buffer		0			0	
Temporary	840	12,600	187	840	12,600	187
Permanent		0	0		0	0
Pond						
Below OHW		0	0		0	0
Pasture		0	0		0	0
Timber		15,000	2,111		15,000	3,600
Total		15,000	2,111		15,000	3,600
Wetland		8,020	1,200		0	0
Wetland buffer		0			0	
Temporary		0	0		0	0
Life of Project		15,000	2,111		15,000	3,600
Water discharge						
Below OHW	15	300	22	15	300	22
Pasture	0	0	0	0	0	0
Timber	170	3,400	201	95	1,900	113
Total	185	3,700	223	110	2,200	135
Wetland		0			0	
Wetland buffer	100	2,000		0	0	
Temporary	185	3,700	223	110	2,200	135
Permanent		4			4	
Power line						
Below OHW	0	0	0	0	0	0
Pasture	1,140	11,400	127	1,140	11,400	127
Timber	0	0	0	0	0	0
Total	1,140	11,400	127	1,140	11,400	127
Wetland	0	0		0	0	
Wetland buffer	0	0		0	0	
Temporary	1,140	11,400	127	1,140	11,400	127
Permanent		0	0		0	0
Total						
Below OHW	15	500	96	15	500	96
Pasture	3,140	47,200	1,596	3,230	49,000	1,795
Timber	210	19,200	2,431	215	19,300	3,855
Total	3,365	66,900	4,124	3,460	68,800	5,746
Wetland		8,020	1,200	0	0	
Wetland buffer	140	2,800			0	
Temporary	3,365	51,740	1,999	3,460	53,640	2,132
Long-term		15,164	2,125		15,164	3,614

Note: A blank cell in the table indicates that the measurement is not applicable.

As discussed in Chapter 2, Section 2.1.4, Forest Service groundwater might be used by the project for emergencies under two conditions. One is to spray the relatively warm groundwater over the intake early in the acclimation season when icing conditions in the river occur. The other would be to provide a small amount of emergency water to the pond if the surface water supply fails. Approximately 0.5 cubic feet per second (cfs) would be needed for these purposes. Statistics on ice conditions in the Chewuch are not available but Yakama Nation staff estimate that water might not be needed every year, and if it is, the duration would be a week or less. It is unlikely that emergency groundwater at the pond would ever be required but could provide some small level of support in case there is a major system failure. These potential uses of groundwater by the project, given the most likely season of use (most likely early spring, and at the latest mid-May), are unlikely to affect the Forest Service's use of the water for irrigation, which normally is needed after May. The groundwater could be used only when the Forest Service has turned on the existing irrigation system.

Neither alternative acclimation pond site is in the pasture, and no project elements would require moving the corral fencing. Both pond sites are more than 100 feet from the helispot and parking areas used during forest fires, so those uses of the ranch property would not be affected.

Because any impacts to land use at the Ranch would be temporary and would be mitigated, impacts of the Proposed Action on land use would be low.

Mitigation Measures

For both alternatives under the Proposed Action, the pasture disturbed during excavation for the pipelines would be replanted with a seed mix approved by the Forest Service's Ranch manager.

Regulatory Compliance

Okanogan Forest Plan
This project is consistent with the Okanogan Forest Plan, as amended, because it will not impair the uses for which the land is designated.

Northwest Forest Plan
The project is consistent with Riparian Reserve values as identified in the Northwest Forest Plan because it would not adversely affect riparian resources or uses.

No Action Alternative

No acclimation pond and facilities would be constructed, so land use at Eightmile Ranch would not change.

3.1.5 Cumulative Effects

The Proposed Action would remove approximately one acre of pasture from production for one season and would not impair designated land use at the Ranch. The Forest Service does not propose activities that would change land use at the Ranch. Therefore, the Proposed Action would not have cumulative effects on land use on or near the Ranch.

3.2 Soils

3.2.1 Information Sources

- Natural Resources Conservation Service Web Soil Survey (NRCS 2012).
- Wetland Delineation Report (Grette Associates 2013).

3.2.2 Analysis Area

The analysis area includes the alternative pond sites, pipelines (including surface and groundwater), power conduit, intake and discharge sites, access road, and staging area.

3.2.3 Affected Environment

The Natural Resources Conservation Service's (NRCS) Soil Survey of Okanogan County Area, Washington identifies two soil series present within the study area (Figure 3-2): Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes (soil type 392 in Figure 3-2) and Boesel fine sandy loam, 0 to 3 percent slopes (soil type 119 in Figure 3-2) (Harrington and Morris 2008). The proposed project area is circled in red in the figure.

The soil survey (NRCS 2012) shows that both pond locations have Wapal stony ashy coarse sandy loam. This soil type is "somewhat excessively drained" (NRCS 2012), and between a depth of 10 to 20 inches encounters a strong difference in texture. It is not considered prime farmland.

The intake, water supply, and part of the water discharge line would be in Boesel fine sandy loam. This soil type is found in stream terraces; at Eightmile Ranch it generally borders the river. It is a moderately well-drained soil type, with a strongly contrasting textural layer between 20 and 40 inches deep. It is considered prime farmland.

The average slope in the analysis area is 0.6%. The steepest slopes (up to 25%) are at the intake and discharge sites.

3.2.4 Environmental Effects and Mitigation

Excavation for the pond and other project elements, especially the deep excavations for the pond and the surface water supply pipeline, could change soil profiles. Heavy construction equipment could compact soils, including in the staging area and on the portion of the surface water pipeline route that would be used to access construction areas. Compacted soils could reduce soil productivity in those areas that are in pasture.

Table 3-1 shows the volume of soil disturbed or removed for each project element that requires excavation. Except for the pond sites and surface water supply lines, the effects on soils would be the same for both alternatives.

Proposed Action, Location 1

Construction of the acclimation pond in this location would remove hydric soils in the portion of the pond that is wetland, identified as Wetland B in Grette Associates 2013 (see Appendix 3). Soils within Wetland B are mapped by the NRCS Soil Survey of Okanogan County as Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes (392) (Grette Associates 2013). The wetland delineation survey indicated that these soils met the criteria for hydric soils. A total of 2,111 cubic yards of soil, most of which would be wetland soils, would be removed to construct the pond (Table 3-1). Soils from the

wetland would be stockpiled in a berm surrounding the pond and, to the extent possible, used to reclaim the wetland once the pond is no longer needed. An additional 14-15 cubic yards would be permanently removed to construct the intake and outlet structures.

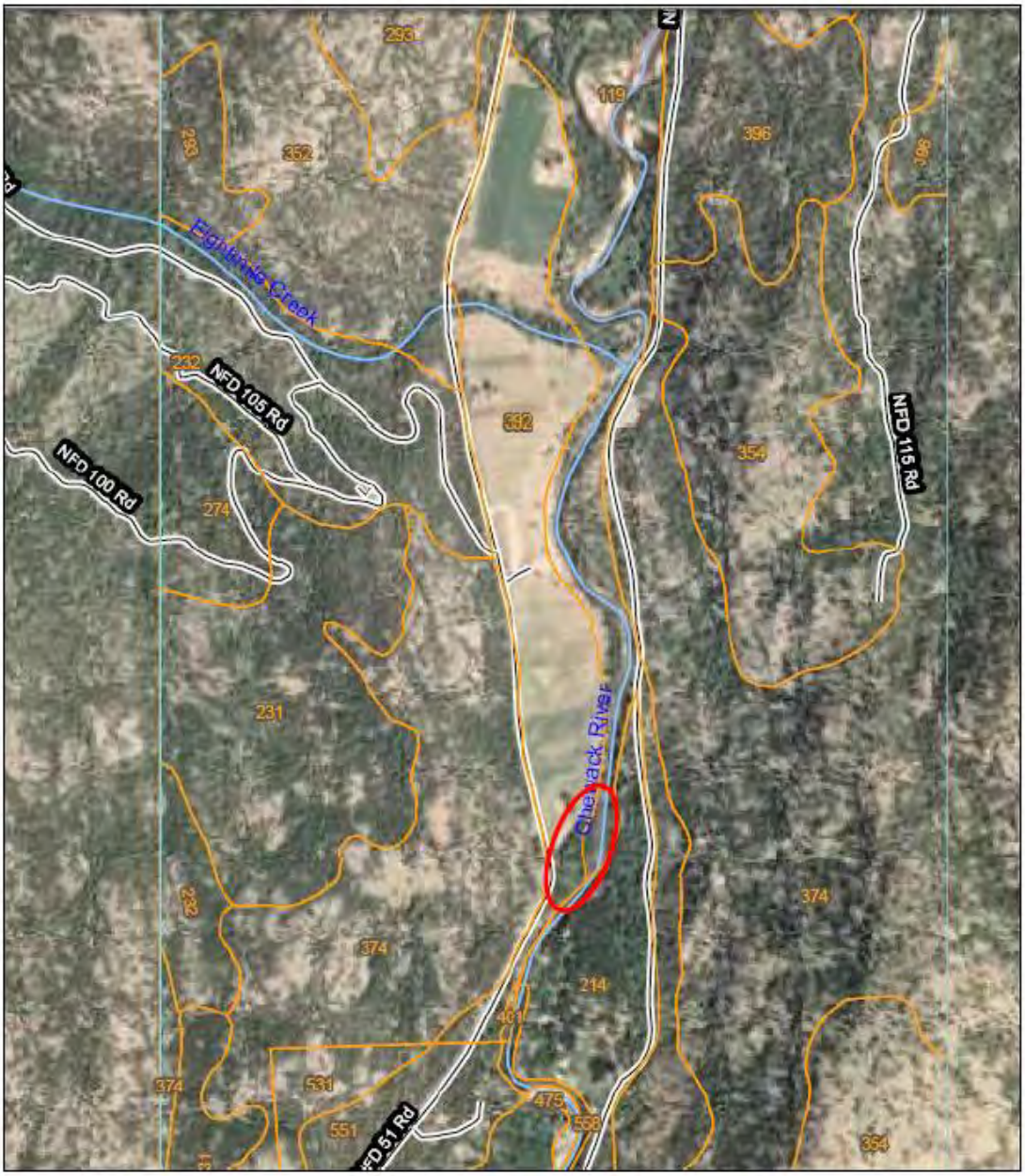


Figure 3-2. Soil Types at Eightmile Ranch

In addition, Table 3-1 shows that 1,999 cubic yards of soil would be temporarily displaced to excavate the water and power lines. Much of this area is in the Boesel fine sandy loam soil type, which is classified as prime farmland. To mitigate any potential loss of productivity, topsoil would be segregated from subsoil during excavation; when back filling the trench, the topsoil would be placed back on top.

Impacts to soil productivity for pasture would be low, because they would be mitigated immediately after construction. While it is expected that the stockpiled wetland soils would retain their capacity to support wetlands once the acclimation pond is removed and the area restored (Grette Associates 2014a [Appendix 1]), impacts to wetland soils would be moderate to high because the restoration would not take place for 15 to 20 years (see Section 3.5).

Mitigation Measures

During excavation, topsoil would be segregated from subsoil; when back filling the trench, the topsoil would be placed back on top, to minimize potential reduction in soil productivity.

Soils from the wetland would be stockpiled in a berm surrounding the pond and are expected to be used to reclaim the wetland once the pond is no longer needed. See Section 3.5 for details.

Regulatory Compliance

Northwest Forest Plan Aquatic Conservation Strategy Objectives

The Proposed Action's consistency with the Aquatic Conservation Strategy is discussed in Section 3.16.2 of this EA.

Farmland Protection Policy Act

The Farmland Protection Policy Act (7 U.S.C. 4201 *et seq.*) directs federal agencies to identify and quantify adverse effects of federal programs on farmlands. The purpose of the act is to minimize the number of programs that unnecessarily contribute to the conversion of agricultural land to non-agricultural purposes. Other than the intake site in the river bank, excavation in soils designated as prime farmland and suitable for farming would be only for buried pipelines. The excavated areas would be replanted and other measures taken to minimize the potential reduction in soil productivity (see "Mitigation Measures" subsection above). Therefore, the Proposed Action would not permanently remove prime farmland from production.

Proposed Action, Location 2

Construction of an acclimation pond at this location would not remove hydric wetland soils. A total of 3,614 cubic yards of soil would be permanently removed for the pond and the intake and outlet structures, and 2,132 cubic yards temporarily displaced for the other project components (see Table 3-1).

Mitigation Measures

Mitigation measures would be the same as for Location 1, except that no soils would be stockpiled because a wetland would not be excavated.

Regulatory Compliance

Regulatory compliance for this location is the same as for Location 1.

No Action Alternative

Because there would be no construction, there would be no impacts to soils at Eightmile Ranch.

3.2.5 Cumulative Effects

No other temporary or permanent soil disturbing activities are proposed on the Ranch. Because productivity of soils used to support pasture is expected to be restored once construction is complete, the Proposed Action would have no cumulative effect on soil productivity on or near the Ranch. Cumulative effects on wetlands are discussed in Section 3.5.5.

3.3 Water Quantity

3.3.1 Information Sources

Eightmile Ranch Coho Acclimation Site Instream Flow Evaluation (Courter et al. 2012).

3.3.2 Analysis Area

The analysis area includes the Chewuch River in the vicinity of Eightmile Ranch and the groundwater well at the Eightmile Ranch site.

3.3.3 Affected Environment

Washington Administrative Code (WAC) 173-548-020 establishes base flows for the Chewuch River from the mouth to the headwaters (including the analysis area). These base flows are shown in Figure 3-3 as "minimum instream flows" along with the 1991 to 2010 average (mean) and the lowest 10% daily flows[5]. Minimum instream flows vary with the season. WDOE establishes minimum instream flows to protect fish, game, birds or other wildlife, recreational or aesthetic values, or water quality.

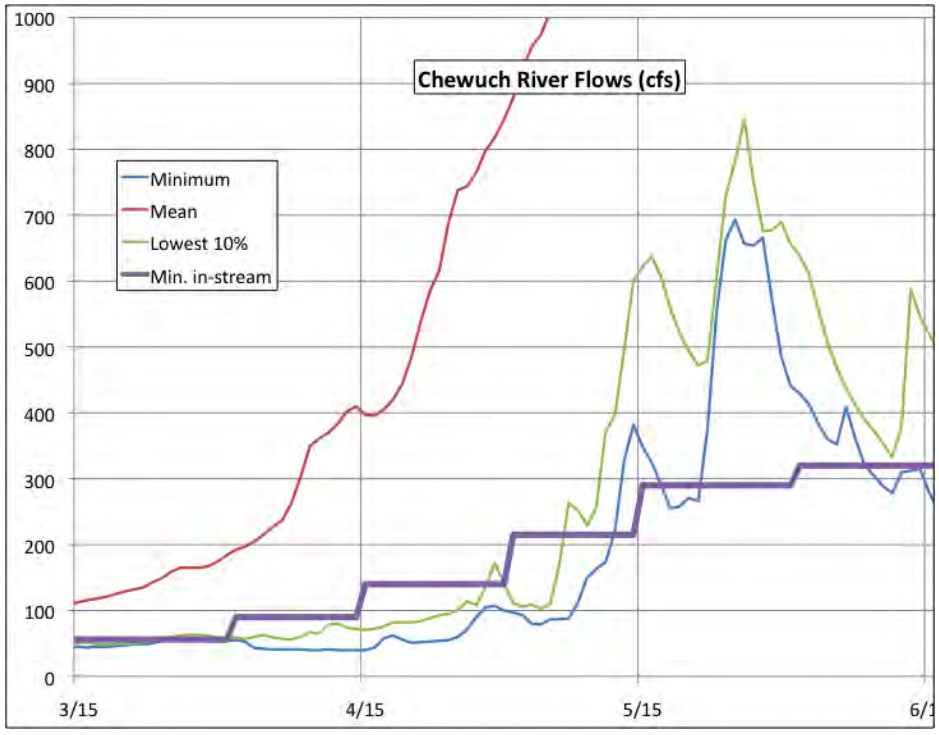


Figure 3-3. Chewuch River Flows

[5] The lowest 10% daily flow is the value that has a 1 in 10 chance of occurring that day. USGS Gage #12448000 Chewuch River at Winthrop, WA.

3.3.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

The proposed acclimation pond would be supplied by gravity flow from the Chewuch River through a screened intake to a concrete manhole, piped to the pond, and then discharged by pipe back to the Chewuch River. The pond would require a minimum withdrawal of 3.1 cfs, but water rights and supply systems would be designed to include a 50% safety factor, or 4.6 cfs.

Water withdrawal for the acclimation pond is considered non-consumptive under Washington state water law because of the short distance between the water intake and outlet, a distance of approximately 1,070 feet for Location 1 and 1,380 feet for Location 2. No other water users withdraw from that reach, and downstream surface water users would not be affected because the water withdrawn would be returned to the river. However, although the withdrawals are considered non-consumptive, the project must still maintain minimum instream flows in the withdrawal reach.

Figure 3-3 shows that during the proposed acclimation period (6 – 8 weeks between March 15 and June 15), a 4.6 cfs withdrawal represents 10% or less of the total average minimum river flow measured during a 20-year period from 1991 to 2010. However, the potential exists for the acclimation period to coincide with extreme low flows; in that case, the 4.6 cfs withdrawal for the pond could reduce the total flow in the Chewuch to below the required minimum instream flow. The minimum instream flow varies throughout the year, but at 56 cfs is the lowest in the early part of the acclimation season (Figure 3-3).

If, during dry years, a 4.6 cfs withdrawal could reduce water quantity to below established minimum instream flows in this reach, Yakama Nation would take measures to avoid such a result. For example, Yakama Nation would delay the start of the acclimation period until river flows increase, reduce water needs by acclimating fewer fish, reduce withdrawals until water flows rise, and/or install temporary equipment such as portable pumps to reuse water. Pumps could be moved to the pond site that would pump water before it is discharged at the pond outlet back to the near the intake. In any event, minimum instream flows would be maintained.

Because groundwater withdrawals, if approved, would be limited to no more than minimal amounts a few days each early spring (see Chapter 2, Section 2.1.4), Forest Service and other groundwater users in the vicinity would not be affected.

Mitigation Measures

To maintain minimum instream flows during extreme low-flow periods, Yakama Nation would take one or more of the following measures:

- Delay the start of acclimation until Chewuch River flows increase to the point where a 4.6 cfs withdrawal would not reduce flows below minimum instream flows.
- Acclimate fewer fish.
- Reduce withdrawals until river flows increase.
- Implement methods to re-use water, including the use of portable pumps to re-circulate the pond water.

Regulatory Compliance

Northwest Forest Plan Aquatic Conservation Strategy Objectives
Section 3.16.2 describes the project's consistency with the Aquatic Conservation Strategy Objectives.

No Action Alternative

Because there would be no new water withdrawals at this site, there would be no reduction in spring flows in the Chewuch River.

3.3.5 Cumulative Effects

The Mid-Columbia Coho Restoration Program EIS evaluated the cumulative effects in the Methow and Wenatchee basins of surface and groundwater withdrawals for all proposed 24 acclimation sites and the new hatchery site. While development of consumptive and non-consumptive uses of surface and groundwater is likely throughout the two basins, because the water used would be returned close to the intakes, the withdrawals are considered water neutral (non-consumptive) and would have no regional impact on stream flows. The EIS concluded that operation of the proposed facilities individually or collectively was not expected to have measurable impacts to stream flows in areas outside the immediate facility locations (USDOE/BPA 2012). Therefore, surface water withdrawals for one acclimation site would not add to the cumulative effects of other water withdrawals in the Methow basin.

If groundwater at the proposed Eightmile acclimation site is used, it would be for no more than a few days, if any, during the acclimation period. Therefore, groundwater use at the proposed facility would not have cumulative effects with other groundwater development throughout the Methow basin.

3.4 Water Quality

3.4.1 Information Sources

- Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012).
- Washington Department of Ecology 303(d) list in "Current Assessment" (https://fortress.wa.gov/ecy/wqamapviewer/).

3.4.2 Analysis Area

The analysis area is the Chewuch River in the vicinity of Eightmile Ranch.

3.4.3 Affected Environment

Washington's water quality standards are the basis for protecting and regulating the quality of the state's surface waters. The standards identify designated and potential uses of water bodies, such as aquatic life, swimming, fishing, domestic and agricultural water supplies, etc.; they set water quality criteria to protect those uses; they contain anti-degradation policies to protect high quality waters; and in many cases they specify how criteria are to be implemented, for example in permits (Washington Dept. of Ecology website: http://www.ecy.wa.gov/water.html).

Under section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters, known as 303(d) lists. The listed impaired waters do not meet water quality standards that regulatory entities have set for them. The Methow River is listed as impaired for temperature, and as waters of concern for pH and dissolved oxygen. Currently, no Total Maximum Daily Loads (TMDLs) have been developed to address temperature impairments. Although a segment of the Chewuch River, beginning approximately 2,500 feet downstream of the proposed project site, is listed for temperature (Current Assessment, https://fortress.wa.gov/ecy/wqamapviewer/), the Chewuch River adjacent to the Eightmile Ranch site likely exceeds the state water quality standards for temperature. Thus, these waters would be protected by the state's Tier II anti-degradation policy. Tier II does not allow degradation of surface waters that are of exceptional quality (that exceed the water quality standards) through new or proposed actions unless such degradation is necessary and in the overriding public interest. Washington State requires a permit applicant to perform a Tier II anti-degradation evaluation if the proposed activity has the potential to cause a measureable change in water quality. The measurable change criterion relevant to this project as defined in the Washington Administrative Code (WAC 2006) is a temperature increase of 0.3 degree Celsius (C) or greater. This means that the proposed action may not cause the water temperature to increase by 0.3 degree C or more.

3.4.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

Impacts to water quality can come from construction activities and from operation of the acclimation facilities.

Construction can increase sediment levels where construction activity is in the stream or in riparian areas, with resulting effects on fish and other aquatic species. See analysis and impact avoidance measures in Section 3.8 Fish.

Construction equipment operating in or near streams can leak petroleum products and other pollutants. Such leakage would be minimized by proper equipment maintenance, use of absorbents, and refueling away from the water body. For a complete list of proposed water quality protection measures, see Design Criteria in Chapter 2, Section 2.5.6.

Water discharged during operation of the proposed acclimation pond would contain various forms of phosphorus. These discharges have the potential to stimulate algal growth and lead to larger daily fluctuations in dissolved oxygen and pH in the receiving waters and, consequently, may exacerbate existing water quality concerns.

Water quality impacts from operation of acclimation facilities were evaluated in the Mid-Columbia Coho EIS (USDOE/BPA 2012). Measurements were made at existing acclimation ponds in the Wenatchee basin, and the results applied to analyses of proposed new sites in both the Wenatchee and Methow basins. The analysis of effects from existing acclimation sites was considered applicable to the proposed sites because the low-phosphorus feed used was the same as that proposed for the new sites, and environmental conditions at the sites were similar throughout the two basins. Potential effects identified included increases in phosphorus/nutrients and temperature and changes

to dissolved oxygen and pH downstream of acclimation sites. Individual sites were evaluated, as well as the cumulative impact of all sites proposed in each subbasin. The EIS concluded that proposed coho acclimation activities would have a negligible impact on surface water quality (USDOE/BPA 2012). The supporting study found no measurable nutrient discharges when the acclimation sites were not in use (USDOE/BPA 2012, Appendices 6 and 7). This indicates that the nutrients remaining on the pond bottom were rapidly assimilated.

These conclusions can be applied to the proposed acclimation site at Eightmile Ranch. Approximately 200,000 smolts would be acclimated at the new pond. Based on measurements at existing acclimation sites in similar environments in the Wenatchee basin, the total phosphorus (TP) loads from this site are estimated to average about 64 grams per day; maximum TP loads would be seen when fish are largest and the greatest amount of feed is being consumed just before they are released to migrate downstream (USDOE/BPA 2012, Appendix 7). The effects on water quality from acclimating 200,000 coho were evaluated at the Heath site in the upper Methow, which has flows and conditions similar to those at Eightmile Ranch; impacts from discharges at that site were determined to be negligible (USDOE/BPA 2012). Another site proposed in the EIS (Methow State Wildlife Area Eightmile) is only a couple of miles upstream from the site at Eightmile Ranch. The following statement is from the EIS analysis:

> The watershed for the Chewuch is similar to the upper portions of the Methow River (predominantly forested with very little human influence). Thus, a similar approach as that used for the upper Methow sites…was used here. The long-term (1991 through 2010) average flow for March through May reported at the USGS Gage in Winthrop is about 700 cfs, which is lower than but comparable to the upper Methow River flows. Given the similarity in the subbasin characteristics, background loads, and acclimation-related nutrient loads, water quality impacts from acclimation activity are expected to be negligible (USDOE/BPA 2012).

The EIS found that effects on temperature of the receiving waters due to discharges from acclimation ponds normally fell below the measurable change criterion for Tier II waters (0.3 degrees Celsius) in the Washington Administrative Code (USDOE/BPA 2012). Although the withdrawals for the acclimation pond at Eightmile constitute a larger proportion of Chewuch flows during the low flow period in early spring (see Section 3.3.4), air temperatures are low then, so that the potential for the pond discharges to measurably warm the river are unlikely. Later in the spring, when air temperatures are warmer, river flows are much higher, so the discharges from the pond would be a much smaller proportion of total river flow and also unlikely to measurably change the river temperature. Therefore, discharges from the proposed acclimation pond are not expected to increase water temperature in the 303(d)-listed segment of the Chewuch downstream from the site (Mugunthan 2014).

Mitigation Measures

Water quality protection measures proposed for construction and maintenance activities are listed in Chapter 2, Section 2.5. To minimize phosphorus levels in the pond discharge, Yakama Nation would use low-phosphorus fish food.

Regulatory Compliance

Northwest Forest Plan Aquatic Conservation Strategy Objectives
Section 3.16.2 describes the consistency of the Proposed Action with the Aquatic Conservation Strategy Objectives.

State and County Permits
Instream construction requires a Hydraulic Project Approval from Washington State, which would specify when in-water work can occur and what measures would be needed to protect channels, riparian zones, and water quality. In addition, a Shoreline Substantial Development Permit might be required from Okanogan County (under authority delegated by Washington Department of Ecology) for working within 200 feet of a waterway. These permits would stipulate conditions for near-water construction activities.

No Action Alternative

Because no acclimation pond would be constructed at this site, there would be no change to water quality in the Chewuch River.

3.4.5 Cumulative Effects

The Mid-Columbia Coho Final EIS evaluated cumulative water quality impacts in the Methow basin from all proposed acclimation sites in combination with other development activities in the basin that could increase phosphorus levels in Methow basin rivers. The analysis included three proposed and two backup coho acclimation sites in the Chewuch subbasin (USDOE/BPA 2012, Section 3.15.1). The conclusion states: "TP [Total Phosphorus] loads from acclimation activity are unlikely to cause a measurable change in DO and pH in the Methow River; thus cumulative effects of the project would be negligible." Given that the proposed acclimation site at Eightmile Ranch would replace at least two of the Chewuch sites evaluated in the EIS, the Proposed Action would have similar low cumulative effects on water quality in the Methow basin.

Due to the time of year acclimation takes place, discharges from the Eightmile acclimation pond are unlikely to contribute cumulative effects on water temperatures in the Chewuch River.

3.5 Wetlands and Floodplains

3.5.1 Information Sources

- Wetland Delineation Report (Grette Associates 2013 [see Appendix 3]).
- U.S. Fish and Wildlife Service National Wetlands Inventory (NWI) (USFWS 2012).

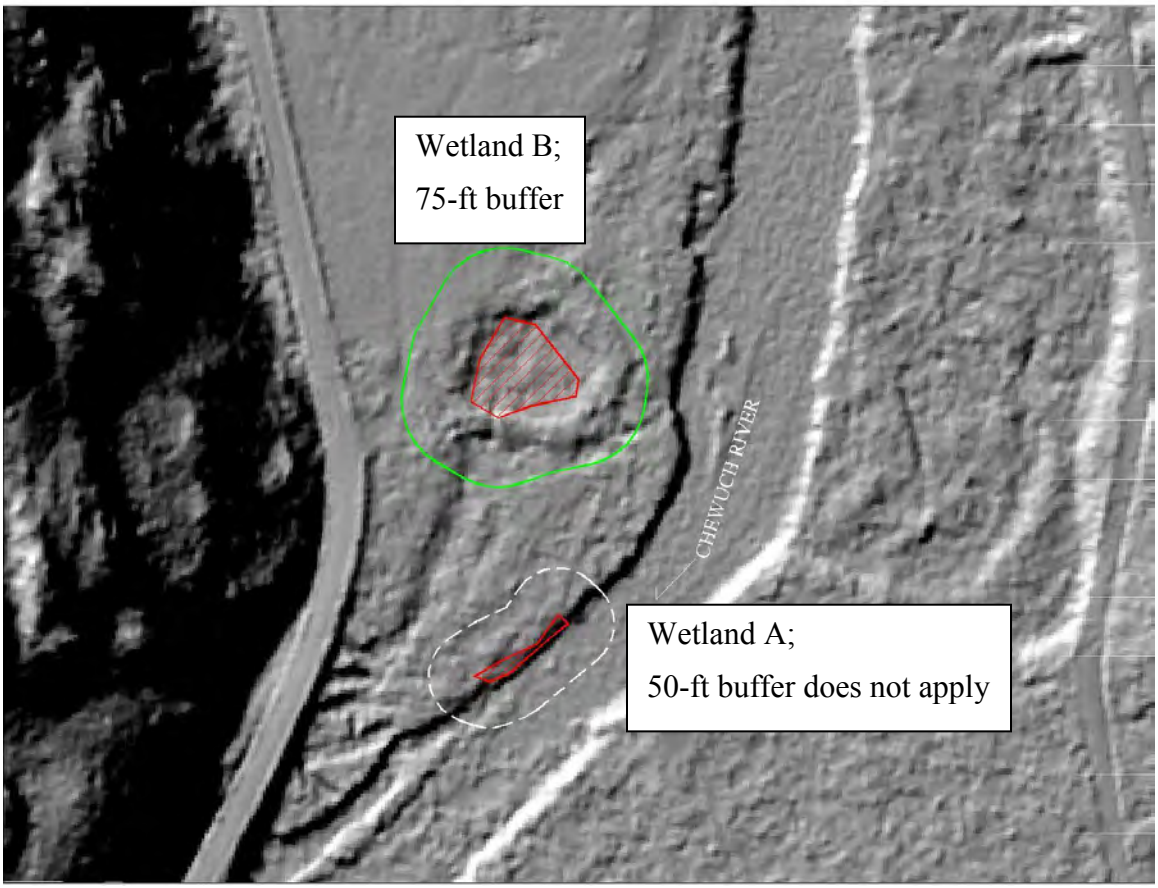
3.5.2 Analysis Area

The analysis area encompasses the land surrounding all potential project construction sites at Eightmile Ranch.

3.5.3 Affected Environment

Floodplains. Flood Insurance Rate Maps do not extend to the proposed site on the Chewuch. However, it is likely that the entire project area is within the 100-year floodplain.

Wetlands: On August 15, 2012, biologists conducted a wetland survey and delineated wetland boundaries in the area being considered for the proposed Eightmile acclimation pond (Grette Associates 2013 [see Appendix 3]). Two wetlands were identified: Wetland A and Wetland B (Figure 3-4).



Source: Grette Associates 2013

Figure 3-4. Wetland Survey Overlaid on Hillshade Survey Data

Wetland A comprises approximately 1,229 square feet; it is located along the bank of the Chewuch River in a relatively narrow strip approximately 113 feet long (Figure 3-4). Wetland A is limited to the lower portion of the river bank by the abrupt change in elevation. It is generally dominated by herbaceous species and is classified under the Cowardin system (Cowardin et al. 1979) as a riverine emergent, temporarily-flooded wetland.

Wetland B comprises approximately 8,068 square feet and is located 230 feet north of Wetland A in a large depression on the property (Figure 3-4). Wetland B is generally dominated by tree and herb stratum vegetation and is classified under the USFWS Cowardin system as a palustrine forested, seasonally-flooded wetland.

To rate the relative functions of a certain wetland in comparison to other wetlands in the region, Washington Department of Ecology has developed the Washington State Wetland Rating System for Eastern Washington (Hruby 2006). This rating system categorizes wetlands using a function-based approach. Wetlands are categorized based on their potential and opportunity to perform certain water quality, hydrologic, and habitat functions. These functions include filtering runoff, reducing flooding and erosion, and providing diverse and undisturbed habitat for a variety of wildlife species. Possible ratings range from Category I (highest quality) to Category IV (lowest quality). Using this rating system, biologists rated Wetland A as a Category III wetland and Wetland B as a Category II wetland (Grette Associates 2013).

Wetland buffer widths and mitigation requirements in Okanogan County are determined based on the wetland rating. Chapter 14.12.640 of the Okanogan County Code (OCC) identifies standard buffer widths for low-intensity development. The standard wetland buffer width for Category II wetlands (i.e., Wetland B) in the vicinity of low-intensity land use is 75 feet; the standard buffer width for Category III wetlands (i.e., Wetland A) is 50 feet. However, per OCC chapter 14.12.570, all Category II and III wetlands under 2,500 square feet are exempt from regulation. Thus, Wetland A, being 1,229 square feet, is not regulated under OCC, and the 50-foot buffer does not apply.

The following paragraphs describe the functionality of the two wetlands found in the vicinity of the Proposed Action.

> Wetlands A and B both score low for hydrologic function. However, as Wetland A and Wetland B are different wetland classes (riverine and depressional respectively) the reasons for the low scores associated with hydrologic function are different. Wetland A scores low on hydrologic function because it provides minimal overbank storage, and as such has limited opportunity to reduce flooding and stream degradation. Wetland B scores as having low hydrologic function as a result of limited opportunity to reduce flooding and erosion due to its position in the landscape as well as minimal water storage during wet periods as evidenced by limited ponding marks.
>
> Wetlands A and B both score high for habitat function. As the habitat questions are the same for all hydrogeomorphic classes, Wetland A and Wetland B obtained high scores for habitat for similar reasons, including: interspersion of habitat, special habitat features found within the wetland such as snags and large woody debris, the intact nature of the associated buffer area, and the relative proximity of priority habitats.
>
> Wetlands A and B score differently on water quality functionality. Wetland A scores low on water quality functionality. The reason Wetland A scores low is that it has very limited or no opportunity to improve water quality. Conversely, Wetland B scores moderate on water quality functionality because grazing occurs within 150 feet of the wetland. Thus, Wetland B has the opportunity to improve water quality (Grette Associates 2013).

Table 3-2 summarizes the characteristics of the two wetlands identified in the analysis area.

Table 3-2. Eightmile study area wetland summary

Wetland	Area (square feet)	Cowardin Classification	Preliminary Washington State Rating	Regulated by Okanogan County?
A	1,229	Riverine Emergent Seasonally Flooded (RES)	III	No
B	8,068	Palustrine Forested Seasonally Flooded (PFOS)	II	Yes

3.5.4. Environmental Effects and Mitigation

Proposed Action, Location 1

Floodplains: The construction of a pond would likely lower flood elevations a small amount due the removal of excavated soils from the floodplain. Unless stockpiled for wetland restoration, soils excavated for the pond or installation of buried water pipes would be disposed of outside the 100-year floodplain. Consequently, changes in grades that could direct or divert flood flows affecting properties either upstream or downstream of the project site are unlikely. Overall impacts on the floodplain would be low.

Wetlands: Figure 3-1 in Section 3.1.3 shows that the acclimation pond in this location would almost entirely replace Wetland B, and would require construction of portions of the water supply and discharge lines within the 75-foot wetland buffer. Although mitigation measures (see below) would be implemented to restore similar plant communities to the extent possible, the existing functional values of this wetland for habitat and water quality improvement would be altered for the duration of the project, a moderate to high effect.

Stockpiling of wetland soils for 20+ years would likely change some of their hydric characteristics. Due to a lack of seasonal saturation/inundation, anaerobic conditions would no longer be present. The change to aerobic soil would likely reduce the amount of organic matter accumulated in the soil due to increased microbial use of organic carbon. Other hydric soil characteristics such as iron reduction and translocation and/or concentration of reduced iron would be likely to remain present in the soil for many years. This has been identified in areas that have been artificially drained or protected by dikes (R. Walker, Senior Biologist, Grette Associates, pers. comm., 11/27/2013).

If the soil characteristics change to that of non-hydric soils over time, it would not make them incompatible with re-developing hydric characteristics once anaerobic conditions are reintroduced in the future. Organic accumulation would increase due to a diminished rate of decomposition, and iron in the soil would again be reduced, translocated, or accumulated depending on the hydrologic regime and associated inundation/saturation of the soil (R. Walker, pers. comm., 11/27/2013).

Mitigation Measures

Appendix 1 presents a plan to restore vegetation to the affected area immediately after construction and to restore the site to its original pre-project condition once the acclimation pond is no longer needed. In summary, during construction, the project

would salvage wetland soils from the site and incorporate them into a berm at the pond margin. After the completion of construction, the area would be planted to stabilize the site and minimize erosion. The acclimation pond would be planted with a transitional vegetative boundary that includes an area of emergent species closest to the open water portion of the pond, transitioning to forested vegetation.

Once the pond is no longer needed and project equipment is removed, the soils in the berm would be used to fill in the pond. Soil amendments might be added to support plant survivability and help re-establish the wetland. The area would be planted with native species identified during the wetland delineation; invasive species identified within the pre-project boundaries of the wetland, such as reed canary grass, would not be used (Appendix 1).

Regulatory Compliance

Federal Executive Order 11988, Floodplain Management and Executive Order 11990, Protection of Wetlands.

Impacts to floodplains and wetlands must be assessed and alternatives for protection of these resources evaluated in accordance with these executive orders and with U.S. Department of Energy's Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12). The analysis in this section describes the effects of the proposed program on wetlands and floodplains and evaluates alternatives.

An alternative to removing a wetland to meet the project need exists at Location 2.

Clean Water Act

Non-isolated wetlands are regulated by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. A Section 404 permit from the Corps would be required because Wetland B would be replaced by a pond.

Washington State Clean Water Act

Because development of an acclimation pond in Wetland B would require a federal permit, it would also require an Individual 401 Water Quality Certification and Coastal Zone Management Consistency determination from Washington Department of Ecology. Ecology regulates all wetlands under the State Clean Water Act (RCW 90.48).

Northwest Forest Plan Aquatic Conservation Strategy Objectives

Section 3.16.2 discusses this location's consistency with the Aquatic Conservation Strategy Objectives.

Floodplain Development Permit

Okanogan County might require an approval to allow construction within a designated floodplain, to ensure that appropriate design measures are included.

Proposed Action, Location 2

Floodplains: Effects on the floodplain at this location would be similar to those for Location 1.

Wetlands: An acclimation pond and associated facilities at this location would not adversely affect either wetland; all project elements would be located outside the wetland boundaries. A small section (approximately 50 feet) of the pond's security fence might

encroach a few feet into the wetland buffer surrounding Wetland B, but would occupy too small an area to change the protective qualities of the buffer.

Mitigation Measures

Because this alternative location would not affect wetlands or wetland buffers, no wetland mitigation measures are proposed. The re-vegetation and reclamation programs as described in Grette Associates 2014b (Appendix 2) and in Section 3.6 below would be implemented.

Regulatory Compliance

Northwest Forest Plan Aquatic Conservation Strategy Objectives
Section 3.16.2 discusses this location's consistency with the Aquatic Conservation Strategy Objectives.

Floodplain Development Permit
Okanogan County might require an approval to allow construction within a designated floodplain, to ensure that appropriate design measures are included.

No Action Alternative

The No Action Alternative would not affect wetlands or floodplains because there would be no development in the wetland or floodplain.

3.5.5 Cumulative Effects

The Mid-Columbia Coho Final EIS identified development projects that were anticipated to occur in the Methow basin over the next several years (USDOE/BPA 2012, Section 3.15, Table 3-44). Some projects likely would add to regional wetland impacts; impacts could be either positive (e.g., habitat restoration projects, including some funded by BPA), or negative (e.g., diking, commercial/residential development). The conclusion in the EIS was that the Mid-Columbia Coho Restoration Program as a whole would not contribute to the cumulative loss of wetlands in the two basins in which project activities were proposed. However, the Proposed Action, as discussed in this EA, would replace acclimation sites in the Chewuch subbasin that would not have affected wetlands. Therefore, the Proposed Action, Location 1, would contribute to cumulative localized loss of wetland habitat, at least for many years until the wetland is restored, but Location 2 would not. Because the affected wetland is small and would be restored in the long term, the cumulative effect on wetlands would be low to moderate.

The EIS concluded that the coho restoration project as a whole would not contribute significant cumulative effects on floodplains "[b]ecause construction activities associated with the project are anticipated to result in very minor conversion of forested lands compared to the watershed as a whole, because some acclimation sites would provide additional floodplain storage, and because new construction would be in accordance with floodplain development codes..." (USDOE/BPA 2012). Therefore, because impacts of the proposed replacement acclimation site are consistent with those analyzed in the EIS, the cumulative effect on floodplains would be low.

3.6 Botany

3.6.1 Information sources

- USFWS: Listed and proposed endangered and threatened species and critical habitat; candidate species; and species of concern in Okanogan county, as prepared by the U.S. Fish and Wildlife Service, Central Washington Field Office. Available online at: http://www.fws.gov/wafwo/speciesmap/OkanoganCounty0312.pdf. Accessed on April 23, 2013.
- Washington Natural Heritage Program Information System: List of Known Occurrences of Rare Plants in Washington. August 2012. Okanogan County. Available on line at http://www1.dnr.wa.gov/nhp/refdesk/lists/plantsxco/countyindex.html. Accessed on April 29, 2013.
- WNHP GIS data set: Locations of rare plant species in Washington State. Last update: February 14, 2013.
- USFS: List of special-status plants known to occur in the Okanogan portion of the Okanogan-Wenatchee National Forest (federal threatened and endangered species and Survey and Manage species).
- USFS: *Region 6 Special Status Species List Eightmile Ranch Acclimation Site Botanical Resource Report*, prepared by Kelly Baraibar, District Botanist, Methow Valley Ranger District, May 15, 2013.
- USFS: Region 6 2011 Regional Forester's Lists of Sensitive and Strategic Plant Species provided under the Interagency Special Status and Sensitive Species Program (ISSSP). This list includes species with federal and/or state status.
- USFS: Natural Resource Information System (NRIS) database of documented occurrences of special-status plants.

3.6.2 Analysis Area

The analysis area consists of all areas that would be disturbed by excavation or by the operation of large equipment. This includes the footprint of the pond, pipelines, new electrical power connection, on-site disposal areas, equipment access routes, and equipment staging areas.

3.6.3 Affected Environment

The analysis addresses effects on riparian and forest vegetation and on priority plants. Effects on wetland vegetation are discussed in Section 3.5. Priority plants include:

- Plants listed under the Endangered Species Act (ESA)
- Plants tracked by the Washington Natural Heritage Program (WNHP) (including state-listed plants)
- USFS Region 6 Sensitive plants
- USFS Survey and Manage plants

The Endangered Species Act of 1973 and its amendments (16 USC 1531 *et seq.*) require federal agencies to ensure that their actions do not jeopardize endangered or threatened

species or adversely modify or destroy designated critical habitat. USFWS is responsible for the listing status of plants.

The WNHP manages site-specific and species/ecosystem-specific information on priority plant species and ecosystems that are rare or have very limited distribution in the state of Washington. The WNHP identifies which species and ecosystems are priorities for conservation efforts, and it designates the status for each species (for example, endangered, threatened, or sensitive) on the Rare Plant list. All ESA-listed and state-listed plant species are included in the WNHP Rare Plant list.

USFS Region 6 sensitive species policy is identified in Section 2670 of the Forest Service Manual (USDA/FS 2005b). Sensitive Species are defined as "those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density and habitat capability that would reduce a species' existing distribution." (USDA/FS 2005b, 2670.5).

The 2001 Northwest Forest Plan Record of Decision (USDA/FS and USDI/BLM 2001) identifies numerous "Survey and Manage" species that are closely associated with late-successional and old-growth forest and that are not likely to persist under other regulatory mechanisms.

As fish-bearing streams, the Chewuch River and Eightmile Creek are protected by Riparian Reserves where they flow adjacent to National Forest lands. These reserves are approximately 300 feet wide (Figure 3-1). Parts of the ranch are in a Riparian Reserve, but the ranch consists mostly of cleared fields and active pastures with a few residences and/or outbuildings scattered throughout the property. The fields and pastures contain mostly grasses such as Idaho fescue, blue wildrye, and "Secar" Bluebunch wheatgrass. The proposed pond and outlet pipe locations are forested with mainly deciduous trees such as cottonwood and willow, with mountain alder, Douglas hawthorn, and red osier dogwood interspersed. Ponderosa pine is also present. Some palustrine forested wetlands occur in this forested area. (See Section 3.5, Wetlands and Floodplains). From the Chewuch River, the intake pipeline passes through an actively grazed pasture and plant communities similar to the pond and outlet pipe locations.

Table 3-3 lists the plants found in the analysis area during a plant survey conducted in May 2013 by the District botanist (Baraibar 2013). Only one of these plants (mountain lady's slipper) is a special-status species.

Mountain lady's slipper is listed in the Northwest Forest Plan ROD (USDA/FS and USDI/BLM 2001) as a Category C species, which means that it is uncommon but that not all sites warrant protection. The population in the analysis area consists of four stems, located in the forested part of the ranch approximately 40 feet west of the Location 1 pond and south of an existing access road. Because this population is in a Riparian Reserve, it is considered high priority, meaning that the Forest Service will manage the site to provide for reasonable assurance of species persistence (USDA/FS and USDI/BLM 2001).

WNHP GIS data indicate that a rare plant called common northern sweet grass (*Anthoxanthum hirtum*) is found within about 0.14 mile of the site. Additionally, about

four populations of black snake root (*Sanicula marlandica*) are documented within about 1.8 miles of the project area. However, neither of these plant species were found during the plant survey and are assumed not to exist in the analysis area.

Table 3-3. Plant species found in the Eightmile Ranch project area

Scientific Name	Common Name	Origin Status
Aster conspicuus	showy aster	Native
Berberis aquifolium	Tall Oregon grape	Native
Berberis nervosa	Cascade Oregon grape	Native
Ceanothus velutinus	snowbrush	Native
Cypripedium montanum	mountain lady's slipper	Native
Equisetum arvense	field horsetail	Native
Galium aparine	cleavers	Introduced
Osmorhiza chilensis	mountain sweet-cicely	Native
Pinus ponderosa	ponderosa pine	Native
Poa spp.	bluegrass	Native
Populus trichocarpa	black cottonwood	Native
Rosa gymnocarpa	baldhip rose	Native
Rubus idaeus	red raspberry	Native
Rubus parviflorus	thimbleberry	Native
Salix scouleriana	Scouler's willow	Native
Shepherdia canadensis	buffaloberry, soopolallie	Native
Smilacina stellata	star-flowered Solomon's seal	Native
Symphoricarpos albus	common snowberry	Native
Thalictrum occidentale	western meadow rue	Native

3.6.4 Environmental Effects and Mitigation

Proposed Action, Location 1

Construction for Location 1 would remove vegetation from approximately 47,200 square feet of pasture and 19,200 square feet of forest; of this amount, 8,020 square feet is palustrine forested wetland. All areas except the 15,000 square feet of pond would be replanted immediately after construction. The planting scheme would follow a detailed plan specified in Appendix 1 and summarized under "Mitigation Measures" below.

Approximately 13 trees would be removed—several cottonwoods and a few ponderosa pines.

Adherence to the mitigation measures listed below would prevent Location 1 from affecting mountain lady's slipper.

Mitigation Measures

The project would adhere to Forest Service management recommendations[6] to protect mountain lady's slipper, the one special-status plant that was detected in the analysis area. The management recommendations are summarized below.

[6] From *Management Recommendations in IM-OR-99-027 - Vascular Plants for Cypripedium montanum*

- Current microclimate conditions of the habitat would be maintained by ensuring that the overstory canopy coverage is at 60 percent or more to prevent increased sunlight to the site.
- Direct mechanical damage to plants, or changes in soil moisture and temperature or the nature of the duff layer would be avoided.
- Before equipment access and earth disturbance begin, a 20-foot buffer (or other distance as specified by the Forest Service botanist) would be placed around the mountain-lady's slipper plants identified during the on-site survey, using a barrier such as high-visibility construction fencing or similar material.

Chapter 2, Section 2.5, also specifies general measures to protect or restore vegetation, including the following:

- Forest Service botanists would be involved before and during project implementation to ensure management recommendations are being met.
- Any disturbed areas would be seeded or replanted with native seed and vegetation to limit establishment and spread of invasive species. See Appendix 1 and the summary below.
- Ground-disturbing machinery would avoid known invasive species populations and will be cleaned before entering the Eightmile Ranch site.

In addition, Yakama Nation has prepared a plan to restore vegetation to the affected area immediately after construction and to restore the site to its original pre-project condition once the acclimation pond is no longer needed. This plan (Grette Associates 2014a) is in Appendix 1. In summary, after the completion of construction, the project area would be planted to stabilize the site and minimize erosion. The acclimation pond would be planted with a transitional vegetative boundary that includes an area of emergent species closest to the open water portion of the pond, transitioning to forested vegetation. All other areas disturbed as a result of this project would be planted with species that mimic the pre-project plant community to the greatest extent possible.

For the duration of operations, most of the pond would be un-vegetated open water, while the margin of the pond would be planted with native emergent vegetation such as dagger leaf rush, inflated sedge, and small fruited bull rush. The upland area immediately surrounding the pond would be wooded to provide shade for acclimating fish and to create a natural visual screen. The proposed woody species include mountain alder, water birch, red osier dogwood, Mackenzie's willow, and Sitka willow. A small vehicle access area next to the pond would be planted with "Durar" hard fescue, "Covar" sheep fescue, Sandberg bluegrass, Idaho fescue, and yarrow.

The area excavated for the pipeline within the pasture would be replanted with "Secar" bluebunch wheatgrass, mountain brome, blue wildrye, Idaho fescue, and yarrow. The area excavated for pipelines within the forest would be replanted with native woody species, including red-osier dogwood, mountain alder, water birch, Mackenzie's willow, and Sitka willow.

After the pond is no longer needed, it would be decommissioned, and the upland and wetland areas would be restored to their pre-project contours. Hydric soils that were used to create the berm would be returned to the restored wetland area. This area would be

planted with plant species that were found in the wetland before construction: small fruited bulrush, Kentucky bluegrass, black cottonwood, star-flowered false Solomon's seal, and Pacific willow. The restored upland areas would be planted to match the adjacent forested area (that is, with red-osier dogwood, mountain alder, water birch, Mackenzie's willow, and Sitka willow).

Regulatory Compliance

Endangered Species Act (ESA)

The project would comply with the provisions of the ESA as described at the beginning of this section because there are no known populations of ESA-listed plant species on the Okanogan portion of the Forest, and the project area contains no suitable habitat for these species.

Forest Service Manual

This alternative complies with Chapter 2670 of the Forest Service Manual (USDA/FS 2005b) because the District has reviewed the program as part of the NEPA process and has identified species of concern at the site and mitigation measures that will prevent harm to the mountain lady's slipper. In addition, as required by the manual, the project would:

- Manage "habitats for all existing native and desired nonnative plants, fish, and wildlife species in order to maintain at least viable populations of such species."
- Avoid actions "which may cause a species to become threatened or endangered." (USDA/FS 2005b, 2670.12)

Northwest Forest Plan

This alternative complies with the Northwest Forest Plan because Forest Service staff surveyed for Survey and Manage species and identified measures to protect the one species found at the project site.

This alternative also complies with Northwest Forest Plan standards and guidelines for Riparian Reserves because the project would be implemented in cooperation with federal, tribal, and state fish management agencies to identify and eliminate impacts (FW-4) (USDA/FS and USDI/BLM 2001, Attachment A).

Okanogan Forest Plan

This alternative complies with Forest-wide Standards and Guidelines in the Okanogan Forest Plan because sensitive plants would be protected.[7] Impacts to sensitive plants would be avoided by performing plant surveys during the flowering season in advance of construction and by creating a no-work buffer zone around the one sensitive plant species (mountain lady's slipper) found in the project vicinity.

This alternative complies with Forest-wide Standards and Guidelines pertaining to riparian areas, because riparian areas would be maintained or restored to natural conditions.[8]

The site is in Management Area 5, which has no specific Standards and Guidelines for threatened, endangered, or sensitive species or habitat.

[7] Forest-wide Standards and Guideline 6-19.

[8] Forest-wide Standards and Guidelines 2-1 through 2-14.

Proposed Action, Location 2

The construction for Location 2 would remove vegetation from approximately 49,000 square feet of pasture and 19,300 square feet of forest. These areas would all be replanted immediately after construction, with the exception of the 15,000 square feet of pond. The planting scheme would follow a detailed plan specified in Appendix 2 and summarized below.

This alternative would have no effect on mountain lady's slipper because work would occur approximately 60 feet from the documented population, and a 20-foot no-work buffer (or other distance as specified by the Forest botanist) would be marked around the population.

Approximately 26 large trees, primarily ponderosa pine and cottonwood trees taller than 20 feet, would be removed. The trees range from 4 to 36 inches in diameter. This is considered a low effect because the project would maintain 60% canopy cover near known populations of mountain lady's slipper to maintain habitat standards for the plant.

Mitigation Measures

The general mitigation measures as summarized for Location 1 would be used at Location 2.

A 20-foot no-work buffer (or other distance as specified by the Forest botanist) would be marked around the population of mountain lady's slipper, although work on this alternative is not expected to be closer than 60 feet from the population.

The re-vegetation plan for Location 2 is somewhat different from Location 1 because no wetland vegetation is affected. The site re-vegetation plan (Grette Associates 2014b) is in Appendix 2. In summary, after the completion of construction, the project area would be planted to stabilize the site and minimize erosion. The area excavated for the pipeline in the pasture and for the pipelines in the forest and the pond margin would be replanted with native grasses and woody species as approved by the Forest botanist. Species could include "Secar" Bluebunch wheatgrass, mountain brome, blue wildrye, Idaho fescue, yarrow, red-osier dogwood, mountain alder, water birch, Mackenzie's willow, and Pacific willow.

After the pond is no longer needed, it would be decommissioned and restored to its pre-project contours. The disturbed area would then be replanted as described above (Grette Associates 2014b).

Regulatory Compliance

The project would comply with relevant regulations as for Location 1.

No Action Alternative

Yakama Nation would not build an acclimation site at Eightmile Ranch, so there would be no construction impacts to federally listed or state priority plant habitats and species, or to riparian or forest vegetation.

3.6.5 Cumulative Effects

As discussed in the Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012), residential development is anticipated in the Methow basin over the next several years,

and would likely contribute to cumulative impacts on native vegetation communities. The EIS concluded that this development is expected to have significant cumulative impacts on native vegetation, unlike the coho restoration program. Therefore, given that native species would be used to restore disturbed vegetation after development of the replacement acclimation site discussed in this EA, the Proposed Action is not expected to contribute to cumulative impacts on vegetation in the Methow basin.

3.7 Invasive Plants

3.7.1 Information Sources

- Desired Future Condition pertinent to Eightmile Acclimation Pond project. Prepared by Kelly Baraibar, district botanist, using guidelines from the 2005 Record of Decision of the Final Environmental Impact Statement for the Pacific Northwest Invasive Plant Program (USDA/FS 2005a).
- *Region 6 Special Status Species List Eightmile Ranch Acclimation Site Botanical Resource Report*, prepared by Kelly Baraibar, District Botanist, Methow Valley Ranger District, May 15, 2013.
- Forest Service weeds database.

3.7.2 Analysis Area

The analysis area consists of the entire ranch site, especially areas that would be disturbed by excavation or by the operation of large equipment. This includes the footprint of the pond, pipelines, new electrical power connection, on-site disposal areas, equipment access routes, and equipment staging areas.

3.7.3 Affected Environment

Invasive plants are introduced species that can thrive in areas beyond their natural range of dispersal. These plants are characteristically adaptable, aggressive, and have a high reproductive capacity (USDA, National Invasive Species Information Center). Many are considered weeds.

Forest Service staff queried the Forest Service weeds database; no documented occurrences of invasive plants were found in the analysis area. However, during a May 2013 plant survey, the District botanist reported populations of diffuse knapweed (*Centaurea diffusa*) along the pasture to the north of the analysis area and to the west of the analysis area along Forest Service Road 51. The District botanist also reported populations of diffuse knapweed along the fence of the lower horse pasture and along West Chewuch Road. The populations in the lower pasture have been treated. From pond Location 1, populations exist approximately 50 feet to the north and 150 feet to the west. Populations exist approximately 600 feet north and 205 feet west of pond Location 2.

3.7.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

Both alternative pond locations have low potential for introduction or spread of invasive plants to the project area. Both weed populations identified by the District botanist are

outside the project area, so they are unlikely to be affected by construction or operations. Although diffuse knapweed is easily spread, including by the wind and by being carried in the fur and hair of wildlife and domestic animals, implementation of the mitigation measures listed below would minimize the potential for project activities to introduce weeds from off site.

Mitigation Measures

Yakama Nation will follow the standards for invasive plants as outlined in USDA/FS 2005a and the district botanist's recommendations outlined in the botanical resources report (Baraibar 2013).

- All heavy equipment (bulldozers, skidders, graders, backhoes, dump trucks, etc.) used for project construction and operation would be cleaned before entering the Eightmile acclimation site.
- Machinery entering the work site would not drive through the population of diffuse knapweed identified to the north and west of the project area.
- Weed-free straw and mulch certified by the state of Washington or using the North American Weed Free Forage Program standards or similar certification process would be used for re-vegetation and erosion control activities.
- To prevent the establishment of invasive plant species, Yakama Nation would re-vegetate the site immediately after construction and also at the end of the project period when the pond is decommissioned, as outlined in Appendices 1 and 2.

Regulatory Compliance

The 2005 Record of Decision of the Final Environmental Impact Statement for the Pacific Northwest Invasive Plant Program (USDA/FS 2005a) outlines goals and objectives for the management of invasive plant species on National Forests. The Forest Service is required to ensure that actions occurring on National Forest lands actively prevent the spread of invasive plants, treat established invasive plant populations in a timely manner, and minimize the conditions that favor the introduction of invasive plants. The standards and guidelines are presented as an attachment to the ROD.

The proposed project at either location would incorporate the standards and guidelines for prevention of the spread of invasive plant species specified in USDA/FS 2005a (see "Mitigation Measures" above). Therefore, the Proposed Action would comply with the provisions of the Okanogan Forest Plan.

No Action Alternative

If the acclimation facility is not constructed, there would be no potential for Yakama Nation coho acclimation activities to introduce invasive plants to the Eightmile Ranch site.

3.7.5 Cumulative Effects

Invasive plants, including invasive weeds such as diffuse knapweed, are spread by many human activities that disturb native vegetation, as well as by wind and other natural means. Use of the mitigation measures discussed above would result in a low contribution to the numerous activities in the Methow basin that cause the spread of invasive weed populations.

3.8 Fish

3.8.1 Information Sources

In addition to data collected during an on-site survey on June 6, 2012, the following data sources were used in this analysis:

- U.S. Fish and Wildlife Service lists of special-status species under ESA (USFWS 2013).
- WDFW data on Priority Habitats and Species (PHS) and other special status species (WDFW 2013a and 2013b).
- Stream surveys by the Forest Service (USDA/FS 2009c) and Bureau of Reclamation (USDI/BOR 2008).
- Forest Service lists of special status species.

3.8.2 Analysis Area

For the purpose of analyzing impacts to fish, the affected area was considered to be in the Chewuch River and along its banks between the intake and a point 300 feet downstream of the outlet (discharge) (see Figure 3-1 for intake and outlet locations). The 300-foot analysis area is based on the Washington State water quality standards for construction projects, which state: "For waters above 100 cfs flow at the time of construction, the point of compliance shall be three hundred feet downstream of the activity causing the turbidity exceedance." (WAC 173-201A-200). The base flow for the Chewuch River is 100 cfs (see Section 3.3, Figure 3-3).

3.8.3 Affected Environment

This section identifies fish species in the affected area, focusing on fish listed under ESA and ESA-designated Critical Habitat, WDFW's Priority Habitats and Species (PHS) Program, areas designated as Essential Fish Habitat (EFH) under the Magnuson-Stevens Act, USFS Region 6 Sensitive Species, and USFS Management Indicator Species. These species and habitats are the focus of the effects analysis in Section 3.8.4 due to low numbers, greater vulnerability, or special importance.

Under the ESA, National Marine Fisheries Service (NMFS) identifies marine wildlife and anadromous fish determined to be at risk; USFWS is responsible for the listing status of non-marine fish and wildlife and of plants.

Under the ESA, a species is endangered when it is at risk of extinction throughout all or a significant portion of its range. A threatened species is likely to become endangered in the foreseeable future throughout all or a significant portion of its range.

ESA-listed species that are likely to be present near the proposed Eightmile Ranch coho acclimation site include spring Chinook (*Oncorhynchus tshawytscha)*, summer steelhead (*O. mykiss)*, and bull trout (*Salvelinus confluentus*).

- NMFS listed the Upper Columbia River spring-run Chinook salmon Evolutionary Significant Unit (ESU) as endangered on March 24, 1999 (64 FR 14308), and its status was reaffirmed on June 28, 2005 (70 FR 37160). The ESU includes all naturally spawned populations of spring-run Chinook salmon in Columbia River tributaries upstream of the Rock Island Dam as well as six artificial propagation programs.

- NMFS originally listed the Upper Columbia River steelhead distinct population segment (DPS) as endangered on August 18, 1997 (62 FR 43937) and subsequently upgraded it to threatened status in 2009 (74 FR 42605). The DPS includes all naturally spawned anadromous *O. mykiss* (steelhead) populations below natural and man-made impassable barriers in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border, as well as six artificial propagation programs.
- USFWS listed Columbia River bull trout as threatened on June 10, 1998 (63 FR 31647).
- Critical Habitat was designated in the Methow basin for both spring Chinook and steelhead in 2005 (70 FR 52630). In the project area, the Chewuch River is designated Critical Habitat for spring chinook and steelhead.
- The Methow River has been identified as core bull trout habitat for the Upper Columbia Recovery Unit and was designated as Critical Habitat on October 18, 2010 (75 FR 63898). In the project area, the Chewuch River is designated Critical Habitat for bull trout.

Under the PHS Program, WDFW catalogs habitats and species that are a priority for conservation, preservation, and management. Priority species require protective measures for their survival due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. PHS status is defined under the following criteria:

> **Criterion 1. State-Listed and Candidate Species:** State-listed species are native fish and wildlife species legally designated as Endangered, Threatened, or Sensitive. State Candidate species are fish and wildlife species that will be reviewed by WDFW for possible listing as Endangered, Threatened, or Sensitive.
>
> **Criterion 2. Vulnerable Aggregations:** Vulnerable aggregations include species or groups of animals susceptible to significant population declines, within a specific area or statewide, by virtue of their inclination to aggregate. Examples include heron rookeries, waterfowl concentrations, and fish spawning and rearing areas.
>
> **Criterion 3. Species of Recreational, Commercial, and/or Tribal Importance:** Native and non-native fish and wildlife species of recreational or commercial importance, and recognized species used for tribal ceremonial and subsistence purposes, whose biological or ecological characteristics make them vulnerable to decline in Washington or that are dependent on habitats that are highly vulnerable or are in limited availability.

USFS Region 6 sensitive species policy is identified in Section 2670 of the Forest Service Manual. Sensitive Species are defined as "those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density and habitat capability that would reduce a species' existing distribution (FSM 2670.5)."

USFS Management Indicator Species (MIS) are animals identified in the Okanogan National Forest Land and Resource Management Plan. Forest Service guidance directs resource managers to analyze the effects of a proposed project on the habitat of each MIS at the project scale and to monitor population and habitat trends at the bioregional scale.

Table 3-4 shows which special-status fish species could be present in the analysis area. Table 3-5 shows the life-stages of the species that could be present in the analysis area.

Table 3-4. Special-status fish species and proximity to project

Species	Species Presence								
	Federal Status	State Status	PHS Criteria	USFS R6 Sensitive	MIS	EFH	Lower Chewuch	Chewuch River	Adjacent to project?
Westslope cutthroat	-	-	3	-	Yes	-	Yes	Yes	Yes
Rainbow / redband trout	-	-	1, 3	-	Yes	-	Yes	Yes	Yes
Steelhead	T	C	1, 3	Yes	Yes	-	Yes	Yes	Yes
Spring Chinook	E	C	1, 2, 3	Yes	Yes	Yes	Yes	Yes	Yes
Summer/fall Chinook	-	-	-	-	Yes	Yes	No	No	No
Bull trout	T	C	1, 2, 3	Yes	Yes	-	Yes	Yes	Yes
Brook trout	-	-	-	-	Yes	-	Yes	Yes	Yes
Coho	-	-	-	-	Yes	Yes	Yes	Yes	Yes
Pacific lamprey[2]							Yes	Yes	Yes
River lamprey	-	C	1	Yes	Yes	-	No	No	No
Umatilla dace	-	C	1	Yes	Yes	-	Likely	Likely	Likely
Pygmy whitefish	-	S	1, 2	Yes	Yes	-	No	No	No

[1] ESA – Endangered Species Act; PHS – Priority Habitats and Species; EFH – Magnuson-Stevens Act Essential Fish Habitat; MIS – USFS Management Indicator Species; T – Threatened; E – Endangered; C – Candidate

[2] Pacific lamprey are a federal Species of Concern and are monitored by WDFW, but do not fall into any of the categories listed under 1) above. Species of Concern is an informal term referring to a species that might be in need of conservation action. Such species receive no legal protection and use of the term does not necessarily imply that a species will eventually be proposed for listing (USFWS Endangered Species Glossary. http://www.fws.gov/nc-es/es/glossary.pdf)

Table 3-5. Life stages of special-status fish potentially present in the analysis area

Species	Habitat use in Project Area			
	Spawning	Feeding and Rearing	Overwintering	Migration and Adult holding
Westslope cutthroat	-	X	X	X
Rainbow/redband trout	-	X	X	X
Steelhead	X	X	X	X
Spring Chinook	X	X	X	X
Summer/fall Chinook	-	-	-	-
Bull trout	-	X	X	X
Brook trout	-	X	X	X
Coho	X	X	X	X
Pacific lamprey	?	X	?	?
River lamprey	Not present in Methow watershed			
Umatilla dace	Presence probable – habitat use unknown			
Pygmy whitefish	Not present in Methow subbasin			

About 25% of spring Chinook spawning in the Methow watershed occurs in the Chewuch River. Spring Chinook salmon spawn in the Chewuch River from river mile (RM) 2 to just above the confluence with Coleman Creek (to about RM 36), including the project area. High redd densities are also found between RM 3.3 and RM 7.7 (USDA/FS 2009c), just downstream of the analysis area.

About 8% to 9% of the total observed steelhead redds in the Methow River basin were found in the Chewuch River during redd surveys conducted by WDFW from 2003 to 2007 (USDA/FS 2009c). Steelhead are known to spawn in the reach of the Chewuch River that contains the project area (Streamnet 2012).

Bull trout use the analysis area as a migration corridor to upriver spawning and rearing habitat and as foraging and overwintering habitat (Streamnet 2012). The nearest documented spawning location is in Eightmile Creek, about 1.5 miles upstream of the mouth and about 2.0 miles upstream of the analysis area. Spawning is also documented in the Chewuch mainstem in the 2.5 miles of the river below Chewuch Falls, about 20 stream miles upstream of the project area. The only other location in the Chewuch basin with documented bull trout spawning is the uppermost reach of Lake Creek, located about 19 river miles upstream of the project area (USDA/FS 2009c).

Planted eastern brook trout, which can out-compete native trout species, are found in the Chewuch River and in all the fish-bearing tributaries downstream. However, population size is very small. Of 1,702 fish observed during a 2000 snorkeling survey in the lowest 10 miles of the Chewuch River, only 21 (1%) were brook trout (USDA/FS 2009b).

All lamprey are considered culturally important to a number of Native American tribes; WDFW monitors their status and distribution to prevent them from becoming listed as endangered, threatened, or sensitive. Initial data from a Methow subbasin-wide survey indicate that the Pacific lamprey is the only lamprey species in the Methow and Lower Chewuch Watershed. Lamprey are present within the Chewuch River from the mouth to beyond the upper boundary of the Lower Chewuch Watershed, which includes the analysis area. The life stage observed was ammocoetes (juveniles). They were found in sand and silt habitat throughout the river. Approximately 90 ammocoetes were counted in the Lower Chewuch Watershed, but researchers estimated that there were several thousands in the river (USDA/FS 2009b).

Other fish species found in the analysis area of the Chewuch River include rainbow trout, westslope cutthroat trout, sculpin, long-nosed dace, suckers, and mountain whitefish (USDA/FS 2009b).

3.8.4 Environmental Effects

The impact analysis focuses on effects to ESA-listed fish, and on Pacific lamprey due to their cultural importance to tribes in the region. ESA-listed fish are considered the most vulnerable due to their low numbers. The analysis assumes that project effects on ESA-listed fish represent the worst-case potential for effects on all fish species. Therefore, effects on other fish species are addressed only if impacts have come into question in the past as being different from those to ESA-listed fish.

Types of Impacts

Potential impacts to fish from construction and operation of acclimation facilities are:

- **Construction.** Construction activities can increase sediment in waterways, thus causing fish to avoid the area or temporarily stop feeding or causing mortality of eggs and alevins in spawning gravel.
- **Surface water withdrawals.** Withdrawing water during low-flow periods could slow or prevent fish migration and could reduce the availability and quantity of habitat. Withdrawing water during high-flow periods can improve habitat by reducing depth and velocities that are greater than optimal for fish.
- **Water quality during operations.** Discharges from the acclimation pond could contain nutrients (phosphorus and nitrogen) from fish feed and fish waste. If nutrient levels in water are too high, they can promote growth of algae. Algal photosynthesis and respiration cycles can induce changes in pH and dissolved oxygen beyond the ranges found under natural conditions, thus reducing the quality of fish habitat for sensitive species.
- **Fish entrainment in water intake facilities**. If allowed to pass through the intake screens, juvenile fish of a small enough size could be subject to predation by coho in the acclimation ponds, and all entrained fish could have free migration delayed by the pond discharge fish screens. NOAA Fisheries screening guidelines (NMFS 2008) would be used for the intake; therefore, entrainment of ESA-listed and other species is not expected and will not be discussed further.
- **Interspecies effects.** The effects listed below were analyzed in the Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012).
    - Predation. Natural-origin coho juveniles could prey on smaller fish during rearing or during their downstream migration.
    - Competition. Naturally produced coho smolts could compete with other fish species for habitat and food.
    - Redd disturbance. Coho could disturb or destroy other species' redds when spawning in the natural environment.

The potential for the project to have adverse interspecies effects on ESA-listed species was determined to be low (USDOE/BPA 2012). BPA has consulted with NMFS and USFWS on the entire coho restoration program. In its Biological Opinion dated February 28, 2014, USFWS found that "the proposed action is not likely to jeopardize the continued existence of the bull trout or destroy or adversely modify…critical habitat for the bull trout" (USFWS 2014). A Biological Opinion from NMFS for effects on steelhead and spring Chinook has not been received as of this writing but is expected to make similar findings. BPA and Yakama Nation will adhere to the terms and conditions of these agencies' Biological Opinions to ensure that the project minimizes adverse effects on listed fish, including monitoring of interspecies effects and annual meetings to discuss findings. Therefore, these effects will not be discussed further in this EA.

- **Beneficial effects.** Reintroducing coho to the Methow and other Mid-Columbia basins could help restore the ecological balance of the system. The importance of marine-derived nutrients to ecological function has been documented in numerous studies, both as a direct food source for juvenile salmon and the contribution of nutrients to nutrient cycles in riverine and adjacent upland habitats (Bilby et al. 1998; Cederholm et al. 1999; Chaloner et al. 2002, 2007; Chaloner and Wipfli 2002; Heintz et al. 2004; Kohler et al. 2012, 2013; Naimen et al. 2002; Wipfli et al. 2004; Zhang et al. 2003). Carcasses from spawned coho could add ocean-derived nutrients to the system at a critical period—the onset of winter. Carcasses could provide an important winter food resource, and coho in freshwater residence could be prey for several fish and wildlife species. These basin-wide effects were analyzed in the Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012) and are not quantifiable on a site-specific basis. They will not be discussed further in this EA.

Proposed Action, Location 1

Construction

The physical impacts from construction would be low for all fish species. In-water work is limited to construction of the water supply intake and discharge structures. Excavation to install these structures could create turbidity in the Chewuch River, a fish-bearing water. However, fish would be exposed to minimal turbidity above baseline levels because in-water work would be restricted to a low-flow period (most likely in July through October) when the least vulnerable life stages of fish are present, and because all excavation below the water line would be done behind a coffer dam. In addition, any sediment plume resulting from construction would be limited in accordance with the language in the permits but would not extend more than 300 feet downstream. Because of these measures, fish would not be trapped in turbid water, but they might temporarily avoid the mixing zone. Due to the short duration and limited spatial extent, turbidity is not likely to damage spawning gravels or delay migration.

The potential for impacts to ESA-listed fish and their critical habitat is expected to be greatest when flow is initially provided to the site after construction. A light plume of suspended fine sediments could be discharged into the river and dispersed downstream. These events are rarely lethal to fish, but their response can range from avoidance to temporary cessation of feeding activities (Hicks et al. 1991). Sediments could smother existing redds. However, the project would avoid impacts to redds because Yakama Nation would do one of the following: 1) Yakama Nation would not perform work if redds are present within 300 feet of in-water work, as determined by WDFW redd survey data; or 2) Yakama Nation would install protection (such as a turbidity curtain) around an active redd to prevent smothering.

Construction of the new surface water intake and discharge would remove less than 1,000 square feet of streamside (riparian) vegetation. Vegetation along waterways provides a number of benefits to fish habitat, including shade (temperature control), bank stability (erosion control), woody debris (flow control and refuge), nutrients that provide a basis for the aquatic food chain (e.g., from decaying leaves and grasses), and sources of prey (e.g., insects and benthic invertebrates). The area affected by these activities would be

very small (30 linear feet), would be replanted after construction is complete, and the number of individual fish adversely affected would be few, if any.

As listed in Chapter 2, Section 2.5, best management practices for erosion and sedimentation control would be followed during construction to prevent discharging suspended sediments into the stream. Additionally, the project would use standard measures to minimize impacts to larval Pacific lamprey, including electrofishing with settings specific to lamprey, performing a slow de-watering of the in-water work area to allow lamprey to escape, and salvaging juvenile lamprey from dredged river sediments before they dry out. For these reasons, construction impacts to any fish, including ESA-listed fish and their critical habitat, are expected to be low.

Surface Water Withdrawals

Water withdrawals from the river to supply the pond would have no effect on flows in the Chewuch River, except in the withdrawal reach, a distance of about 1,070 linear feet. The impacts to ESA-listed fish and their critical habitat would be limited to that portion of the stream and would vary depending on stream flow, species and life-stage. The project would maintain instream flows established by Washington Department of Ecology (Section 3.3).

In the fall of 2011, a Physical Habitat Simulation (PHABSIM) analysis was carried out for the Eightmile Ranch acclimation site along the Chewuch River (Courter et al. 2012). At the time of the field survey and analysis, there was one acclimation pond site proposed for the area. To supply the pond, 4.6 cfs of water would be withdrawn from the river and returned to the river 1,070 feet downstream of the withdrawal area. Water velocity, depth, substrate, and cover data were collected at three transects within the withdrawal reach for use in the PHABSIM model. These three transects, when taken together, were assumed to be representative of the hydraulic conditions in the reach. Results of the analysis were presented as Weighted Usable Area (WUA), which is a relative index of habitat suitability. WUA is calculated for a standardized length of stream (1,000 linear feet). The withdrawal reach was relatively short, which gave the researchers confidence that the model results were representative of conditions in the reach and that the results would apply to the additional pond location proposed after the study was completed.

Table 3-6 shows the percent of the reach that contains suitable habitat for each species with and without withdrawals for the pond, and in average low-water and extreme low-water conditions during the acclimation period (see Figure 3-3 in Section 3.3).

Table 3-6. Estimated percent of weighted usable area (WUA) for ESA-listed species in the Chewuch River study reach under low-flow and extreme low-flow conditions (Location 1)

Species	Life Stage	Life-Stage Timing	Flow Type[1]	Flow (cfs) Mar-Jun	% WUA in study reach Mar-Jun (no withdrawal)	% WUA in study reach Mar-Jun (4.6 cfs withdrawal)
Chinook	Spawning	Aug-Sep	Extreme low	48	18.5	16.1[2]
			Mean low	113	51.2	49.0[2]
	Rearing	All year	Extreme low	48	35.5	32.1
			Mean low	113	69.9	67.9
Steelhead	Spawning	Mar-May	Extreme low	48	15.3	12.2
			Mean low	113	46.5	44.8
	Rearing	All year	Extreme low	48	16.3	14.8
			Mean low	113	37.6	35.9
Bull trout	Spawning	Aug-Oct	Extreme low	48	100.0	98.9[3]
			Mean low	113	78.9	79.8[3]
	Rearing	All year	Extreme low	48	34.8	32.7
			Mean low	113	63.4	62.4

Source: Courter et al. 2012

1. Mean low and extreme low flows for the study reach were calculated as the lowest average daily flow and lowest daily 10th percentile flows, March 15-June 15 for the period of record (1991-2010, USGS stream gauge 12448000).
2. Withdrawals to the pond would not be made during the spring Chinook spawning period, and fry will have emerged by the time withdrawals are made in the spring.
3. The closest documented bull trout spawning is 2 miles upstream of the analysis area.

Data in the table above demonstrate the potential worst case impact on fish habitat (WUA) of the maximum withdrawal (4.6 cfs) for the acclimation pond during the most extreme low flows. The largest potential reduction in WUA would be a 20% reduction in steelhead spawning habitat at the extreme low-flow condition of 48 cfs.

However, withdrawals for the acclimation pond during the March 15 to June 15 acclimation period are expected to have low effects on the amount of available habitat as simulated for spring Chinook, steelhead, and bull trout for the following reasons.

- The project water right would require that withdrawals not reduce flows below minimum instream values. The minimum instream flow during the early part of the acclimation period, before March 31, is 56 cfs. A 4.6 cfs withdrawal would not be made if river flows are only 48 cfs. For example, if instream flows on March 15 were at 60.6 cfs (56 cfs minimum instream flow plus 4.6 cfs maximum acclimation pond withdrawal) or lower, the project would take one or more actions to reduce or delay withdrawals as described in Section 3.3.4. Similar monitoring and calculations would take place as minimum instream flows increase during the acclimation period.
- Records show that flows lower than 56 cfs during the acclimation period are rare. The lowest recorded flow during the period 1992 to 2010 was 48 cfs and the lowest mean flow during the acclimation period was 113 cfs. At this minimum average flow of 113 cfs, impacts to WUA would be less than 5%.
- The water use is non-consumptive except in the withdrawal reach. The WUA impacts occur only over a section of the river that is short relative to the total available habitat.

For these reasons, the withdrawal would also have low effects on designated critical habitat for spring Chinook, summer steelhead, and bull trout in the Chewuch River (Courter et al. 2012).

Water Quality During Operations

Operation of the acclimation sites is likely to have low effects on water quality in fish-bearing streams. The volume of nutrient discharge to surface waters would increase slightly due to fish food and waste. This effect would be limited to the 6-week spring acclimation period, for a period of 20 years. The impact of nutrient loading is expected to be low due to the high dilution volume that likely would be present during the spring high-flow season, the small amounts of nutrients, the use of low-phosphorus feed, the speed with which the nutrients leave the watershed during this time of year, the limited bioavailability of the form of phosphorous being discharged,[9] and the relatively low water temperatures during acclimation. See Section 3.4 in this EA for a more detailed summary of the water quality analysis in the EIS.

Proposed Action, Location 2

Direct effects are the same as for Location 1, except for the effects of surface water withdrawals, which might be slightly different as discussed below.

A pond at Location 2 was proposed after the water withdrawals analysis was done by Courter et al. (2012). This withdrawal reach would be 1,380 feet long, extending an additional 310 feet downstream of the study reach analyzed for Location 1. This would slightly increase the total amount of fish habitat affected by the withdrawal, but it is unlikely to change the relative suitability index for the study reach. Therefore, the PHABSIM model results reported from surveys in 2011 are assumed to be representative of flow effects in the withdrawal reach, regardless of which pond location is chosen. Although this approach extends inferences from the PHABSIM analysis to un-surveyed areas, both the un-surveyed portion of the stream and proposed flow withdrawal are small, suggesting that the change in PHABSIM results would also be small if additional survey data were collected (I. Courter, pers. comm., January 2014).

The data in Table 3-6 indicate that a 4.6 cfs withdrawal during low and extreme low flows in the Chewuch River would have low effects on habitat as simulated for spring Chinook, steelhead, and bull trout. Likewise, the withdrawal would have low effects on designated critical habitat for spring Chinook, summer steelhead, and bull trout in the Chewuch River.

No Action Alternative

The No Action Alternative would require no construction or water withdrawals at this site, so there would be no effect on fish in the vicinity of Eightmile Ranch.

[9] Phosphorus is an essential nutrient for algal growth. However, not all forms of phosphorus can be taken up by algae. Any form of phosphorus that is readily available for biological uptake is said to be bioavailable (i.e., available for ready assimilation by algae).

3.8.5 Mitigation Measures

The project would implement timing restrictions, erosion control measures, and special in-water work methods to avoid or mitigate construction impacts to fish. These measures are detailed in several subsections of Section 2.5 (Design Criteria) in Chapter 2. Permitting agencies such as USFWS or NMFS could require additional measures, which would be implemented. Mitigation measures are the same for both pond locations.

3.8.6 Regulatory Compliance

This section reviews compliance with federal, state, and local regulatory requirements related to the conservation and protection of fish. Regulatory compliance would be the same for both pond locations.

The Endangered Species Act

The Endangered Species Act of 1973 and its amendments (16 USC 1531 *et seq.*) require federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. The effects analysis in this document and Biological Assessments that BPA will prepare and submit to NMFS and USFWS address the potential impacts of the Proposed Action to ESA-listed anadromous fish and bull trout.

Fish and Wildlife Conservation Act

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 *et seq*.), encourages federal agencies to conserve and promote conservation of game and non-game species and their habitats. This project is designed to promote the restoration of coho salmon in areas from which it was extirpated. It would also contribute to the ecological balance of the Methow basin by providing a source of nutrients to other species at the onset of the critical winter period as described in the Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012) and summarized under "Types of Impacts" above.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 (16 USC 661 *et seq*.) also requires federal agencies to consult with the USFWS and state fish and wildlife agencies when "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted…or otherwise controlled or modified" by permit or license.

The proposed action will impound fewer than ten acres and thus, falls under the minimum impounded acreage exception of the Fish and Wildlife Coordination Act. Under 16 USC 662(h), "the provisions of section 661 to 666c of this title shall not be applicable to those projects for the impoundment of water where the maximum surface area of such impoundments is less than ten acres, nor to activities for or in connection with programs primarily for land management and use carried out by Federal agencies with respect to Federal lands under their jurisdiction."

Magnuson-Stevens Fishery Conservation Management Act of 1976

NOAA Fisheries is responsible for ensuring compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (16 USC 1801 *et seq.*). Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Act to

establish requirements for evaluating and consulting on adverse effects to essential fish habitat (EFH).

The proposed Eightmile Ranch coho acclimation site is within EFH for Pacific salmonids (coho and Chinook salmon). As discussed in this effects analysis, impacts to Chinook habitat would be temporary and would not adversely modify Chinook EFH.

Okanogan Forest Plan – Fisheries Standards and Guidelines

Pages 4-31 and 4-32 of the Okanogan Forest Plan (USFS 1989) outline eight standards and guidelines related specifically to fisheries. Of these, the following apply to the Eightmile Ranch coho acclimation site:

3-1 Maintain or enhance biological, chemical, and physical qualities of Forest fish habitats.

The project would have low, short-term effects to chemical and physical qualities of Forest fish habitats (see Section 3.4.4, Water Quality). Existing conditions would be maintained.

3-2 Rehabilitate fish habitats where past management activities have adversely affected their ability to support fish populations.

The project would have no direct impacts on the quantity of existing fish habitat; rehabilitation of habitat at this site was done under a separate BPA program. Design criteria would ensure that the project would have only low, short-term impacts on the quality of fish habitat. See Chapter 2, Section 2.5.

3-3 Sediment in fishery streams shall be maintained at levels low enough to support good reproductive success of fish populations as well as adequate instream food production by indigenous aquatic communities to support those populations.

The project would implement measures to ensure that sediment increases in the Chewuch River would be low and short-term during the two-week in-water construction period (see Section 2.5.3 in Chapter 2). Following the design criteria would ensure that minor, temporary increases in sediment in the river would not adversely affect spawning success.

3-4 Manage streams for high quality pool habitat consistent with the potential for the stream to provide it through natural or artificial means.

The project would not create or impact any pool habitat.

3-5 Provide an average of at least 20 pieces of large wood per 1,000 lineal feet of stream channel on fish bearing streams to provide for aquatic needs

The project would not remove large wood from the stream channel. At Location 1, no trees would be removed within 100 feet of the stream channel; therefore, there would be no effect on the availability of in-stream wood. At Location 2, only three alder trees would be removed from within 100 feet of the stream channel. The area adjacent to the stream bank is well-forested with a mixture of sub-mature ponderosa pine and pole-sized deciduous trees. Therefore, effects on the availability of in-stream wood are expected to be low at this location.

3-6 Manage riparian vegetation to provide sufficient trees near the stream channel to act as a source of large woody debris for future in-stream fish habitat needs. (This standard describes a minimum average forest-wide condition.)

Location 1 would remove up to 13 trees in the Riparian Reserve, and Location 2 would remove 26 trees in the Reserve, but this effect is not large enough to change the average condition of riparian areas forest wide. In any event, as stated above, only 3 of the trees removed for Location 2 would be within 100 feet of the stream channel. "Vegetation removal beyond about 100 feet from the channel has negligible effects to recruitment [of large woody debris]" (FEMAT 1993). Trees removed during construction would be the property of the Forest Service and could be sold for aquatic habitat restoration purposes or left on site.

3-7 Channel disturbing activities should be conducted at minimum flow, or outside of critical spawning and incubation periods.

Work below the OHWM would be conducted during the July 1-31 in-water work window, or during a time period specified in environmental permits, in order to avoid impacts to spawning and incubating fish. In-water work that might be needed outside this period would be coordinated with WDFW.

Standard and Guideline 9-4 currently states that new diversions should not be authorized in rivers eligible for scenic designation under the Wild and Scenic Rivers Act. The Forest Service proposes to amend Standard and Guideline to read: "*A new diversion from the Chewuch River may be authorized for the purpose of supporting an acclimation pond at the Eightmile Ranch."* Based on the direction found in Forest Service Manual 1926.51, this is a non-significant amendment to the Forest Plan for the following reasons:

- The amendment would make a minor change to standards and guidelines and would not significantly alter the multiple-use goals and objectives for long-term land and resource management.
- The Forest Plan anticipated potential pond development in this area. At the time the Forest Plan was written, a possible fish rearing pond was identified near Eightmile Creek, the same section of the river as the current Eightmile Acclimation Pond proposal. The Final EIS indicated that Wild and Scenic River designations should not affect that proposal (USDA/FS 1989, p. G-19).

Fish habitat is identified in the Forest Plan as an Outstandingly Remarkable Value of the Chewuch River. Amending the Forest Plan to allow for development of the pond would allow for an activity that would contribute to achievement of the management prescription. Effects of the proposed project on the Chewuch's potential for listing under the Wild and Scenic River Act is discussed in Section 3.10.

Northwest Forest Plan Aquatic Conservation Strategy Objectives

Section 3.16.2 describes the Proposed Action's consistency with the Aquatic Conservation Strategy Objectives.

3.8.7 Cumulative Effects

The Mid-Columbia Coho Restoration Program Final EIS evaluated the cumulative effects on fish of the overall coho restoration program in combination with past and future

activities in the Methow basin that have affected or could affect fish (USDOE/BPA 2012, Section 3.15.3). The EIS found that the small temporary or long-term reductions in available habitat caused by the program as a whole would be balanced by the benefits of habitat improvement projects currently underway and proposed in the basins that are funded by BPA and other agencies and entities, several of which are in the Chewuch subbasin. It also found that, for the entire program, "[c]onstruction is not expected to result in conditions that cause chronic increases in sediment loads. Therefore, although the project could add to the cumulative effects of basin-wide sources of sediment in streams, the contribution would be small, localized, and would not persist past construction." Therefore, replacement of Chewuch subbasin sites evaluated in the EIS by the Eightmile site proposed in this EA would have a similar low contribution to basin-wide cumulative impacts on other fish or their habitat.

3.9 Wildlife

3.9.1 Information Sources

In addition to data collected during an on-site survey on June 6, 2012, the following data sources were used in the analysis:

- USFWS lists of special status species under ESA (USFWS 2013).
- WDFW data on PHS species and other special status species (WDFW 2013a and 2013b).
- List of USFS Region 6 Sensitive Species occurring on the Wenatchee-Okanogan National Forest, sensitive Management Indicator Species (MIS), and priority habitats and focal species identified in *Conservation Strategy for Landbirds of the East Slope of the Cascade*s (PIF 2001).
- GIS shapefile of Okanogan-Wenatchee National Forest Land Management Plan administrative boundaries.
- Terrestrial wildlife report for a habitat improvement project at the ranch (USDA/FS 2011b).

3.9.2 Analysis Area

The analysis area encompasses all lands within 1,000 feet of the construction activities to account for noise and visual disturbance.

3.9.3 Affected Environment

For this EA, priority wildlife includes animals and habitats with federal or state protected status, species and habitats identified under the WDFW Priority Habitat and Species (PHS) Program, USFS Region 6 Sensitive Species, USFS Management Indicator Species, USFS Survey and Manage Species, and priority habitats and species identified by the *Conservation Strategy for Landbirds of the East Slope of the Cascades* (PIF 2001). All but the last two categories are defined in Section 3.8.3. There is no designated critical habitat for ESA-listed wildlife species in the analysis area.

The 2001 Northwest Forest Plan Record of Decision (USDA/FS and USDI/BLM 2001) identifies numerous Survey and Manage species that are closely associated with

late-successional and old-growth forest that are not likely to persist under other regulatory mechanisms.

The Partners in Flight *Conservation Strategy for Landbirds of the East-Slope of the Cascades Mountains in Oregon and Washington* (PIF 2001) identifies priority habitats, habitat attributes, focal species, and management considerations for the conservation of birds in the region. The Forest Service is one of the partners in the program and has voluntarily agreed to adopt the PIF 2001 management considerations.

Species with ESA, State, or USFS Region 6 Sensitive Status

Based on the information sources listed in Section 3.9.1, Table 3-7 shows the likelihood of ESA-listed, state-listed, WDFW PHS, and USFS Region 6 Sensitive vertebrate wildlife species being present in the analysis area.

Table 3-7. ESA-listed, state-listed or USFS Region 6 sensitive wildlife

Species	Federal Status	State Status	PHS	USFS Region 6 Sensitive	Presence in Affected Area
Bald Eagle	Species of Concern	Sensitive	Yes	Yes	Documented
Harlequin duck	None	None	Yes	Yes	Documented
Gray wolf	Endangered	Endangered	Yes	No	Suspected
Grizzly bear	Threatened	Endangered	Yes	No	Suspected
Lewis' woodpecker	None	Candidate	Yes	Yes	Suspected
Mule deer	None	None	Yes	No	Documented
Northern spotted owl	Threatened	Endangered	Yes	No	Unlikely
Western gray squirrel	Species of Concern	Threatened	Yes	Yes	Potential
White-headed woodpecker	None	Candidate	Yes	Yes	Potential

WDFW documents the following habitat within 1,000 feet of the analysis area (WDFW 2013b).

- The project is located in "winter range for mule deer, significantly higher concentration than in the summer. Important during all but the mildest winters, 500 to 200 deer per square mile."
- The project area is located entirely within a mule deer migration corridor.
- The project area intersects an area denoted as: "bald eagle winter use sites, concentration area, Chewuch River riparian area. Regular concentration."
- The project area intersects an area denoted as: "harlequin ducks during breeding season – regular concentration."

The text below describes the potential for "documented," "suspected," or "potential" species to be present in the analysis area.

Bald eagle

Bald eagles are documented along the lower 6 to 7 miles of the Chewuch River, although not directly in the analysis area. Forest Service data indicate that bald eagle nesting, roosting, and perching sites are not known or suspected near the Eightmile Ranch site. Suitable summer habitat is present in the area, but summer use has not been observed (USDA/FS 2011b).

In winter, bald eagles may congregate in open water bodies that are fish bearing. As such, the Chewuch River, located in the analysis area, may be suitable bald eagle wintering habitat. WDFW documents winter roosting areas within 1,000 feet of the analysis area (WDFW 2013b).

Gray wolf

Gray wolves are known to occur on the Methow Valley Ranger District, but confirmed sightings are not common. Wolves may persist in a wide range of habitat types, provided that wild ungulates, such as mule deer and moose, are present in sufficient numbers. The Eightmile Ranch area may support wolves during spring, summer, and fall when mule deer are present and in winter if moose are present (USDA/FS 2011b).

Grizzly bear

The project area is located within the North Cascades Grizzly Bear Recovery Zone. There have been 5 confirmed reports of grizzly bears on the Methow Valley Ranger District: two in the Pasayten Wilderness and three in non-wilderness areas of the district (USDA/FS 2011b). Grizzly bears could range in the vicinity of Eightmile Ranch at various times of the year. During the summer construction period, grizzly bears could use the site to feed on the seasonally available native berry crop. Although Eightmile Ranch is not adjacent to areas that are lush with berry shrubs, scattered service berry, elderberry, chokecherry and other forage shrubs are found in the general area (USDA/FS 2011b) and could draw grizzly bears to the site.

Harlequin duck

The harlequin duck spends winters in marine areas but breeds in cold, shallow, rapidly flowing mountain streams in forested areas. Breeding generally occurs from May through September. WDFW documents a regular concentration of harlequin ducks in the Chewuch River during the breeding season (WDFW 2013b). Although ducklings were seen on the Chewuch River during harlequin surveys in 2013 (A. Sprague, USFS, pers. comm., 1/7/2014), USFS data note that nest sites have not been identified (USDA/FS 2011b). The site is unlikely to be used for nesting because harlequin ducks seek out remote areas free of human disturbance for nesting. No harlequin ducks were observed during a survey of the Chewuch River adjacent to Eightmile Ranch in June 2011 (USDA/FS 2011b).

Mule deer

Mule deer winter range and migration corridors are located in the analysis area (WDFW 2013b). According to digital data for PHS species (WDFW 2013b), mule deer winter range occurs throughout the lower Chewuch River watershed, including at the proposed project site. WDFW identifies this site as key winter range, containing one to 200 mule deer per square mile.

Northern spotted owl

The Eightmile Ranch does not contain suitable habitat for northern spotted owls. The irrigated pasture and adjacent forest type are not suitable habitat because they do not have mature or old-growth habitat characteristics (USDA/FS 2011b).

Western gray squirrel

In Okanogan County, western gray squirrels use stands of ponderosa pine, Douglas-fir and adjacent riparian areas dominated by black cottonwoods (Linders and Stinson 2007). Western gray squirrels have been documented in the Methow Valley Ranger District, but not in the Eightmile Ranch project area (USDA/FS 2011b, WDFW 2013b). However, suitable habitat exists in the forested portion of the analysis area.

White-headed woodpecker

The white-headed woodpecker is strongly associated with dead and defective tree[10] habitat in open ponderosa pine stands, but it may also use firs and deciduous trees. Suitable habitat occurs in the forested portion of the analysis area.

Survey and Manage Species

Table 3-8 lists the Survey and Manage Species found on the Okanogan-Wenatchee National Forest. Of these, Larch Mountain salamander, Chelan mountain snail, blue-grey taildropper (a mollusk), and masked dusky snail are found only in the former Wenatchee portion of the Okanogan-Wenatchee National Forest, more than 40 miles from the project area. The Puget Oregonian (a mollusk) occurs chiefly on the west side of the Cascade Range and in the Puget Trough (Burke 2005), with a few isolated detections on the east side in Chelan County (BC Invertebrates Recovery Team 2008), at least 40 miles from the affected area.

Table 3-8. Survey and Manage Species on Okanogan-Wenatchee N.F.

Species	Range within Analysis Area	Documented Presence in Analysis Area
Great gray owl	Yes	None
Larch Mountain salamander	No	None
Puget Oregonian	No	None
Chelan mountain snail	No	None
Blue-gray taildropper	No	None
Masked dusky snail	No	None

Source: Personal communication, Anne Sprague, USFS Wildlife Biologist, 1/7/2014.

Great gray owls prefer to nest in mature or old-growth stands, with a fairly open understory and dense overstory (60% or greater canopy closure). In the eastern Washington Cascades, great gray owls use mixed conifer stands dominated by pine, selecting 23- to 31-inch conifers as nest trees. Forest understory is open, dominated by grass and forbs, to support small mammal prey species (Quintana et al. 2004). Nest sites are typically immediately adjacent to large clearings such as meadows or selective harvest areas greater than 10 acres in size. The analysis area does not contain suitable habitat; it is mixed conifer and deciduous riparian forest, rather than mature mixed-conifer forest. Therefore, the project will not affect the great gray owl.

Management Indicator Species

Table 3-9 shows the USFS Management Indicator Species (MIS) found on the Okanogan National Forest that could be present in the analysis area.

[10] Defective trees are diseased, rotten, and/or contain several cavities.

Table 3-9. Management Indicator Species potentially present on the Okanogan National Forest

Management Indicator Species		Habitat Description	Habitat Present in Project Area?	Species Present in Project Area?
Northern spotted owl		Mature and old-growth conifer	No	Unlikely
Barred owl		Mature and old-growth conifer	No	Unlikely
Pileated woodpecker		Mature and old-growth conifer	No	Suspected
Three-toed woodpecker		Mature and old-growth lodgepole pine and subalpine fir	No	Unlikely
American marten		Mature and old-growth conifer	No	Unlikely
Mule deer		Winter range	Yes	Documented
Ruffed grouse		Riparian and deciduous	Yes	Suspected
Primary Cavity Excavators	Pileated woodpecker	Dead and defective trees	Yes	Suspected
	Three-toed woodpecker	Dead and defective trees	Yes	Suspected
	Black-backed woodpecker	Dead and defective trees	Yes	Suspected
	Downy woodpecker	Dead and defective trees	Yes	Suspected
	Hairy woodpecker	Dead and defective trees	Yes	Suspected
	Lewis' woodpecker	Dead and defective trees	Yes	Suspected
	White-headed woodpecker	Dead and defective trees	Yes	Suspected
	Williamson's sapsucker	Dead and defective trees	Yes	Suspected
	Red-naped sapsucker	Dead and defective trees	Yes	Suspected
	Northern flicker	Dead and defective trees	Yes	Suspected

As noted above, the Eightmile Ranch does not contain suitable old growth habitat for northern spotted owls (USDA/FS 2011b). The barred owl, pileated woodpecker, three-toed woodpecker, and marten are management indicator species for mature or old growth habitats. All inhabit old growth, with habitat requirements differing only in the tree species composition. Because old growth forest does not exist on or near the site, none of these species is likely to occur within the analysis area, with the exception of the pileated woodpecker, which may forage in large cottonwoods at the site but is unlikely to nest there (A. Sprague, USFS, pers. comm., 1/7/2014).

As noted above, mule deer winter range and migration corridors are located in the analysis area (WDFW 2013b).

According to a Forest Service wildlife report for a nearby habitat project, ruffed grouse chiefly use stands that contain aspen trees (USDA/FS 2011a). The project area does not contain an abundance of aspen, but it is likely that ruffed grouse use the riparian zone alongside the Chewuch River.

All ten primary cavity excavators listed in Table 3-9 could be present in the analysis area. All inhabit forests with dead and defective trees. Such habitat occurs in and immediately adjacent to the analysis area.

Landbirds

Landbird habitats in the Eightmile Ranch project area include sub-mature ponderosa pine and sub-mature mixed conifer. Table 3-10 shows which landbird species could be present in the analysis area based on habitat presence.

Table 3-10. Landbirds potentially present in the analysis area

Focal Species	Habitat	Habitat Attribute
white-headed woodpecker	Ponderosa pine	old forest - large patches
pygmy nuthatch	Ponderosa pine	large trees
Lewis' woodpecker	Ponderosa pine	burned old forest
brown creeper	Mixed conifer	large trees
Williamson's sapsucker	Mixed conifer	large snags
flammulated owl	Mixed conifer	grassy openings, dense thickets
hermit thrush	Mixed conifer	multi-layered, structural diverse
Lewis' woodpecker	Oak-pine woodland	large pine trees/snags
black-backed woodpecker	Lodgepole pine	mature/old-growth
red-naped sapsucker	Aspen	large trees/snags, regeneration

3.9.4 Environmental Effects

Proposed Action, Location 1

Bald eagle

Construction is not likely to affect bald eagles because it would occur during the summer months, when bald eagles have not been observed in the analysis area. Additionally, the project is unlikely to remove suitable nesting trees, as none were observed within the project footprint. Operation of the site is also unlikely to affect bald eagles. Although site operation overlaps with the bald eagle nesting period, bald eagles are not likely to nest in the analysis area. In any case, operations would not produce enough noise or visual disturbance to deter bald eagle nesting.

Gray wolf

Noise and visual disturbance during construction and operations have the potential to temporarily displace wolves from the affected area. Noise and visual disturbance could also temporarily displace deer and other prey animals, causing wolves to follow. This displacement is likely a low impact, as abundant similar habitat for both the gray wolf and its prey occurs for miles in all directions from the site. In addition, the disturbance would not reduce the amount of prey available to the gray wolf.

Grizzly bear

Noise and visual disturbance during construction and operations have the potential to temporarily displace grizzly bears from the affected area, as well as their prey. This displacement is expected to be a low impact, as abundant similar habitat for both the grizzly bear and its prey exists for miles in all directions; therefore, the amount of prey available to the grizzly bear would not be reduced. The project meets management standards for the North Cascades Grizzly Bear Recovery Zone, as it would not reduce core habitat. The project proposes measures to manage garbage and food on the site to minimize the potential for human/bear interactions.

Harlequin duck

Construction would begin in early June in areas outside of the Ordinary High Water Mark. Work below the OHWM would not occur until July, after nesting is complete and ducklings are on the water. Construction work in or near the riparian area in June could

disturb harlequins if they are present, but their presence is unlikely due to the existing levels of human disturbance in the analysis area.

The acclimation site would be operated in early spring when harlequin ducks are not present. Therefore, operations would have no effect on the harlequin duck.

Mule deer

Construction associated with this location would affect approximately 0.96 acre of mule deer migration habitat and 0.55 acre of mule deer winter range habitat.

Effects would be low because abundant similar habitat occurs for miles in all directions. With the exception of the 0.34 acre of pond and fenced area, most of the effects to habitat would be temporary because the disturbed areas would be replanted with similar species once construction is completed.

Western gray squirrel

Construction at this location would remove approximately 0.13 acre of suitable habitat for the western gray squirrel, including 13 trees, but would not disturb any documented sites. Effects would be low because abundant similar habitat occurs for miles in all directions. Although all of the disturbed suitable habitat would be replanted with similar species, any effects of the loss of 13 trees would be long-term until the new trees reach a similar size.

Ruffed grouse, primary excavators including white-headed woodpecker, and landbirds

Construction of this alternative would remove approximately 0.13 acre of suitable habitat for the ruffed grouse, primary excavators including the white-headed woodpecker, and other landbirds. Construction would remove 13 trees but no snags, and would not disturb any documented sites. Effects would be low because abundant similar habitat occurs for miles in all directions. As for the squirrel, any effects of the loss of 13 trees would be long-term until the new trees planted after construction reach a similar size.

Proposed Action, Location 2

Direct effects are the same as for Location 1, except for the amount of vegetation removed, resulting in the following effects:

- Mule deer: temporarily disturb about 1.09 acres of mule deer migration corridor and 0.50 acre of winter habitat.
- Western gray squirrel: remove 0.5 acre of suitable habitat, including 26 trees.
- Ruffed grouse, white-headed woodpecker, other primary excavators, and landbirds: remove 0.5 acre of suitable habitat, including 26 trees but no snags.

Effects would be low because abundant similar habitat occurs for miles in all directions. Effects to mule deer habitat would be largely temporary because the disturbed areas would be replanted with similar species, with the exception of the 0.34 acre of pond and fenced area. Effects to the squirrel and the birds would be similar to those described for Location 1.

No Action Alternative

Yakama Nation would not build an acclimation site at Eightmile Ranch, so there would be no construction impacts to ESA-listed, Forest Service sensitive, or state priority wildlife habitats and species at this site.

3.9.5 Mitigation Measures

Mitigation measures for both pond locations would be the same.

- To avoid interactions between bears and humans, the contractor would not store food, garbage, or other bear attractants. Food and garbage would be attended during the day and hauled off the site at the end of each day.
- Only non-lethal predator hazing would occur on the site.
- Fish food would not be stored onsite.

3.9.6 Regulatory Compliance

This section reviews compliance with federal, state, and local regulatory requirements related to the conservation and protection of wildlife. Regulatory compliance for both pond locations would be the same.

Endangered Species Act

The Endangered Species Act of 1973 and its amendments (16 USC 1531 *et seq*.) require federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. The effects on species listed under ESA are discussed in Section 3.9.4. Additionally, BPA is preparing a Biological Assessment for submission to USFWS to address the potential impacts of the Proposed Action to ESA-listed wildlife.

Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 *et seq*.), encourages federal agencies to conserve and promote conservation of game and non-game species and their habitats. The Fish and Wildlife Coordination Act of 1934 (16 USC 661 *et seq*.) also requires federal agencies to consult with the USFWS and state fish and wildlife agencies when "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted…or otherwise controlled or modified" by permit or license.

The proposed action will impound fewer than ten acres and thus, falls under the minimum impounded acreage exception of the Fish and Wildlife Coordination Act. Under 16 USC 662(h), "the provisions of section 661 to 666c of this title shall not be applicable to those projects for the impoundment of water where the maximum surface area of such impoundments is less than ten acres, nor to activities for or in connection with programs primarily for land management and use carried out by Federal agencies with respect to Federal lands under their jurisdiction."

Migratory Bird Treaty Act and Federal Memorandum of Understanding

The Migratory Bird Treaty Act (16 USC 703-711) prohibits the taking, killing, or possession of migratory birds except as allowed by the Secretary of the Interior. The list of migratory birds is found in 50 CFR 10, and permit regulations are found in 50 CFR 21. This project would not result in the take, kill, or possession of migratory birds.

BPA (through USDOE) and USFWS have a memorandum of understanding (MOU) to address migratory bird conservation in accordance with Executive Order 13186 (Responsibilities to Federal Agencies to Protect Migratory Birds), which directs each federal agency that is taking actions possibly negatively affecting migratory bird

populations to work with the USFWS to develop an agreement to conserve those birds (DOE and USFWS 2013). The MOU addresses how both agencies can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

In addition, Executive Order 13186, 66 Fed. Reg. 3853 (2001) *Responsibilities of Federal Agencies to Protect Migratory Birds* and the *Memorandum of Understanding between the USDA Forest Service and the US Fish & Wildlife Service to Promote the Conservation of Migratory Birds* (USDA/FS and USDI/FWS 2008) require proposed federal actions to be evaluated for effects on migratory birds.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 CFR 668-668d) prohibits the taking, possession, purchase, sale, barter, transport, export, or import of any bald or golden eagle or any part, nest, or egg of a bald or golden eagle, except for certain scientific, exhibition, and religious purposes. Eagle permit regulations are found in 50 CFR 22.

Washington state wildlife law is contained in Title 77, Revised Code of Washington (RCW). This title contains several sections generally applicable to the NEPA process. Bald eagles and protection of their habitat are addressed in RCW 77.12.650 and 77.12.655. Taking protected wildlife and destroying eggs, including removal of raptor nest trees, are prohibited under RCW 77.16.120.

Bald eagles would not be taken or otherwise harmed by this project. The most likely effect would be beneficial, by increasing a source of food—coho salmon.

Okanogan-Wenatchee National Forest – Wildlife Standards and Guidelines

The Okanogan Forest Plan (USDA/FS 1989) mandates the protection of sensitive species, including threatened and endangered wildlife, management indicator species, landbirds, and other sensitive species. The Okanogan Forest Plan identifies management indicator species for mature and old growth forest habitat, dead and defective tree habitat, deciduous and riparian habitat, lodgepole pine forest habitat, and winter range habitat (USDA/FS 1989, page III-77).

The *Landbird Strategic Plan* (USDA/FS 2000) sets forth goals to provide habitat to sustain populations of landbirds. Region 6 Forest Service actions must consider the guidance provided in the 2000 Plan. In addition, Executive Order 13186, 66 Fed. Reg. 3853 (2001) *Responsibilities of Federal Agencies to Protect Migratory Birds* and the *Memorandum of Understanding between the USDA Forest Service and the US Fish & Wildlife Service to Promote the Conservation of Migratory Birds* (2008) require proposed federal actions to be evaluated for effects on migratory birds.

Forest Service Manual 2670 (USDA/FS 2005b) provides management guidance for threatened and endangered species and their habitat. A biological assessment (BA) is required for all projects planned, funded, executed, or permitted by the Forest Service (FSM 2672.4, USDA/FS 2005b), if the action is likely to affect ESA-listed species. The manual also provides guidance for the management of other sensitive wildlife species and their habitats.

The proposed action would comply with all these executive orders, plans and guidelines. Potential effects to ESA-listed wildlife are addressed in Section 3.9.4. In addition, BPA will produce a Biological Assessment for submission to USFWS to address the potential impacts of this project to ESA-listed wildlife and their critical habitat.

3.9.7 Cumulative Effects

The Mid-Columbia Coho Restoration Program EIS evaluated the cumulative effects of the entire program on sensitive wildlife species. Residential development anticipated in the Wenatchee and Methow basins over the next several years likely would contribute to cumulative impacts to native vegetation communities, which could disturb ESA-listed and sensitive wildlife species. The EIS concluded that while clearing and construction at project sites would contribute in minor ways to cumulative regional fragmentation and net loss of habitats, impacts from continued growth in the region is likely to contribute to loss of habitat in significant ways (USDOE/BPA 2012). Therefore, when combined with the impacts from continued growth in the region, the cumulative effects of the proposed project would be low.

Operation of the project would increase human activity at the site during two months in spring. However the site already experiences human activity and vehicle traffic. Also, the human disturbance impacts associated with the Proposed Action would end when the site is no longer needed. The EIS concluded that no significant cumulative impacts on wildlife would be associated with operation of the program as a whole (USDOE/BPA 2012); therefore, construction and operation of one site would have a low cumulative impact on wildlife.

3.10 Wild and Scenic Rivers

The Wild and Scenic Rivers Act of 1968 (16 USC 1271 – 1287) declared "that certain selected rivers of the Nation which, with their immediate environments possess outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in a free flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations." The stretch of the Chewuch River along which the proposed acclimation facility is located is considered eligible for inclusion in the Wild and Scenic River system (USDA/FS 1989).

3.10.1 Information Sources

Okanogan National Forest Plan (USDA/FS 1989).

3.10.2 Analysis Area

The analysis area includes the segment of the Chewuch River from 100 yards upstream of the proposed intake to 100 yards downstream of Location 2.

3.10.3 Affected Environment

The Okanogan Forest Plan identified the segment of the Chewuch River in which the proposed project is located as eligible for inclusion in the Wild and Scenic River system,

with the classification "Scenic."[11] The project area falls within Segment 3 of the river as defined in the plan. Its outstanding values are scenic, wildlife, fish, and recreation. This portion of the river runs through a natural-appearing forest setting and is considered high-value spring Chinook and steelhead spawning habitat. The river, including this segment, is popular for tubing and rafting (USDA/FS 1989).

In addition, the entire mainstem of the Methow River from its source to the slack waters of Lake Pateros, and its major tributary, the Chewuch River, are included in the "Nationwide Inventory of Wild and Scenic Rivers" (USDI 1982 *in* USDA/FS 1989). The Chewuch is also considered a "River of Statewide Significance" (WAC 173-18-280).

3.10.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

The intake and discharge structures are project elements common to both alternatives that have the potential to be visible from the Chewuch River. Chapter 2, Section 2.1 details the designs proposed for these structures that would minimize their visibility.

Parts of the fence would be visible from the river at both locations. The fence would be a dark earth-toned color to minimize visual impacts during all seasons of the year. Native vegetation would be planted around the pond once construction is completed to screen the fence from river users. It also would be an irregular shape with boulders and other natural materials around the edge to provide a more natural appearance.

Two existing electrical power lines cross the river to power poles on the Eightmile Ranch site (Figure 3-1). For both Location 1 and Location 2, the power poles are along the West Chewuch Road. The northern poles are 230 feet from the river and the southern poles are 330 feet from the river. The poles are currently visible from the river along the power line easements because all large trees from the road to the river have been removed from the easements. Pond and discharge pipeline construction would not make the poles or the conductors more visible.

No project elements at either pond location would adversely affect the qualities that make the Chewuch River eligible for Wild and Scenic River status.

Mitigation Measures

The following measures are proposed for either pond location to prevent the Proposed Action from changing the qualities that make this portion of the Chewuch River eligible for inclusion in the Wild and Scenic River system. See Chapter 2, Sections 2.1 and 2.5, for design details.

- The intake would be submerged below the low-water line to minimize its visibility from oblique angles.
- During the nine months of the year that fish are not being acclimated (June through February), the fish screens would be pulled and replaced with steel sheets that would be painted with camouflage colors.

[11] Scenic under the Act is defined as "Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads." (16 USC 1273(b)(2).

- The intake would be partially obscured by a log jam at the site that is one of several installed as part of a separate Yakama Nation habitat improvement project (BPA Fish and Wildlife Project 2009-003-00) and by vegetation planted along the stream bank.
- The fence surrounding the pond would be coated with a dark earth-toned vinyl so that it would be less visible from the river during all seasons of the year.
- Native vegetation would be planted around the pond to screen views of the fence and pond from the river.
- The pond would be irregularly shaped, with boulders and other natural materials used to give it a natural appearance.

Regulatory Compliance

The Okanogan Forest Plan Standard and Guideline 9-3 designates the segment of the Chewuch where the project area is located as eligible for potential scenic classification under the Wild and Scenic Rivers Act. It states:

> *The potential scenic classification attributes within a one-fourth-mile-wide corridor on each side of the…eligible river segments shall be protected pending Congressional action on river designation.*

Implementing the proposed design criteria and mitigation measures for the pond and the intake and discharge structures ensures that the Proposed Action at either pond location would comply with the Okanogan Forest Plan Standard and Guideline 9-3.

Standard and Guideline 9-4 currently states that new diversions should not be authorized in rivers eligible for scenic designation under the Wild and Scenic Rivers Act. Implementing the proposed design criteria would ensure that the amendment to the Forest Plan that would be required to allow the diversion for the intake would be consistent with the requirement to maintain the eligibility of the Chewuch River for scenic classification under the Wild and Scenic Rivers Act.

No Action Alternative

If BPA decides not to fund the proposed project and the Forest Service decides not to grant a Special Use Permit, there would be no potential to change the qualities making the Chewuch River eligible for Wild and Scenic River status.

3.10.5 Cumulative Effects

Because the Proposed Action would not change the characteristics that make the Chewuch River eligible for scenic status under the Wild and Scenic Rivers Act, the project would have no cumulative effect on the river's scenic qualities or eligibility.

3.11 Visual Quality and Recreation

3.11.1 Information Sources

- Okanogan Forest Plan (USDA/FS 1989).
- U.S. Forest Service landscape and scenery management handbooks (USDA/FS 1974; USDA/FS 1995).
- Landscape character types for National Forests in Oregon and Washington (USDA/FS 1982).

3.11.2 Analysis Area

The analysis area for these resources is the entire Eightmile Ranch site plus the portions of West Chewuch Road and the Chewuch River that border the ranch.

3.11.3 Affected Environment

The project area is located in Management Area 5 as designated in the Okanogan Forest Plan. The goal of management activities in this area is to "provide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective (VQO) of retention or partial retention" (USDA/FS 1989, page 4-65). In the analysis area, the VQO is Retention as viewed from Chewuch Forest Road 5100 (West Chewuch Road), the Eightmile Ranch Administrative Site, and the Chewuch River corridor.

In areas designated as Retention, visitors should perceive all foreground landscapes (areas within a half mile) as natural-appearing, with high scenic integrity. High scenic integrity refers to landscapes where the valued landscape characteristics appear intact. New elements must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident (USDA/FS 1995).

The portion of the Chewuch River below the Pasayten Wilderness Boundary supports a wide variety of recreation activities, including rafting and tubing.

There are no standards and guidelines that pertain specifically to fish production projects; however, the standards and guidelines pertaining to the visual quality objective would apply in this case. The visual quality objective is assigned based on the view from the West Chewuch Road. The project area is within an area of High Visual Significance; therefore the visual quality objective is "foreground retention," which means that the quality of the foreground view when the plan was written should be retained. Management actions must be unnoticeable to the casual observer in order to meet this objective.

The visual quality objectives of foreground retention should also be applied to views from the river to ensure that project elements do not affect its eligibility for Wild and Scenic River designation (see Section 3.10).

3.11.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

At times during the 5-month construction season, recreational users of the river, West Chewuch Road, or the ranch site likely would notice the construction equipment and activity and an increased level of noise and dust above normal conditions. Efforts would

be made to minimize noise and dust during this period (see Section 3.13 Air Quality and Noise). Increased dust is not expected to obscure views from the road or the river. The construction noise would be intermittent during this period.

Construction activity and noise is likely to be more visible and audible to river users and users of the ranch than to visitors on the road. The severity of the impact would depend on the amount of time the affected person is in the vicinity of the work and their sensitivity to noise and the non-natural elements in the landscape. Construction would take place close to the river for either pond location, and some construction would take place on the river bank. Because sound carries well over water, construction noise could be audible for some distance up- or downstream of the site well before the work area is visible, depending on wind speed and direction. However, depending on flow levels, the sound of the river itself could mask some construction noise. Since recreationists use the river during the day and construction must be done during daylight hours, effects to some river users during this 5-month period likely are unavoidable. These effects would be temporary, occurring only during the construction period.

Once construction is complete, the only project element potentially visible from West Chewuch Road would be the fence around the pond. Both alternative pond sites would be partially screened from view by trees and other vegetation, but might be more visible during winter after leaves have dropped and when snow is on the ground. With the proposed measures to naturalize the pond area, travelers using the road are unlikely to see a noticeable difference from current conditions that would affect their perception of the visual quality of the site.

Users of the administrative site would be able to see the pond and fencing at either location if they are in the paddock area, but once the vegetation is established, the pond would conform to the existing landscape elements at the ranch.

Project elements with the potential to be visible to recreational users of the river include the intake and outlet structures and the fencing surrounding the pond. As noted in Section 3.10 (Wild and Scenic Rivers), the Proposed Action includes measures to minimize visibility of these elements; thus, they are not expected to adversely affect the aesthetic experience of river users.

While design criteria would ensure little change to aesthetic and visual qualities as viewed from West Chewuch Road (F.R. 5100), Eightmile Ranch Administrative Site, and the Chewuch River corridor, the pond at Location 1 would be more noticeable from the road and the administrative site because it would be in an existing open area adjacent to the access road to Eightmile Ranch. Although both locations meet the Retention VQO, Location 1 would not meet Retention VQO as well as Location 2 from these two viewing areas, but it would meet Retention from the Chewuch River corridor. At Location 2, the facilities would blend into the landscape better than Location 1 because the area is more secluded and screened with existing vegetation and would meet Retention VQO from all established viewpoints. Impacts on visual quality at either pond location would be low.

During the acclimation period (March through May), approximately 4.6 cfs of water would be withdrawn from the river to supply the acclimation pond. Figure 3-3 in Section 3.3 (Water Quantity) shows this withdrawal amount in comparison to total river flows measured during the acclimation months. People using water craft might be on the river,

particularly during the latter part of this period. However, given the small percentage of total river flow represented by the withdrawal, the intake flow during the acclimation period would not be sufficient to endanger recreational boaters on the river. The intake would include a system that uses compressed air to move debris off the screen surface. Therefore, recreational boaters and other river users would not be affected by project structures.

Mitigation Measures

- Project elements would be designed and sited to minimize views of the facility from the West Chewuch Road (F.R. 5100), Eightmile Ranch Administrative Site, and the Chewuch River corridor. Specific measures outlined in Section 3.10.5 above to protect the scenic qualities of the Chewuch River would also minimize impacts to the natural landscape characteristics as seen from the road and the administrative site.
- Dust abatement measures as described in Section 3.13.5 would minimize effects on visitors' views of the site during the construction period.

Regulatory Compliance

Both alternative pond locations and associated facilities, along with the proposed mitigation measures, would comply with the goal in the Okanogan Forest Plan for Management Area 5 to "provide opportunities for recreation and viewing scenery in a roaded natural setting with a visual quality objective of retention or partial retention." Visual quality as viewed from both West Chewuch Road and from the Chewuch River would be maintained once construction is complete.

No Action Alternative

Because there would be no construction and no new facilities, there would be no effect on visual quality or recreational users of the area.

3.11.5 Cumulative Effects

Because the Proposed Action would not adversely affect the scenic qualities at the site and would not affect recreational users of the Chewuch River; and because no other projects are planned in the vicinity that could cumulatively impact visual quality and recreation in the foreseeable future, there would be no-to-low cumulative impacts on visual quality and recreation.

3.12 Cultural Resources

3.12.1 Information Sources

Cultural resources report by U.S. Forest Service (Gadd 2013).

3.12.2 Analysis Area

The analysis area for this resource encompasses all project areas requiring excavation, plus a 30-foot buffer around each pond and a 15-foot buffer around the centerline of each discharge pipe.

3.12.3 Affected Environment

Cultural resources are resources that chronicle the history of people traversing and utilizing the natural landscape. They are prehistoric and historic artifacts, archaeological sites, historic structures, and traditional cultural properties, including properties of traditional religious and cultural importance to an Indian tribe. Cultural resources also include properties that have been evaluated under the National Historic Preservation Act (NHPA) (16 U.S.C. 470 *et seq*.) and determined eligible for listing on the National Register of Historic Places.[12]

Cultural resource identification efforts in the Eightmile Ranch coho acclimation project area included a field survey, a literature review, Geographic Information Systems (GIS) analysis, and consultation with American Indian tribes (Gadd 2013).

The field survey was conducted by a Forest Service cultural resource specialist in 2013. The analysis area[13] was defined as follows:

- Groundwater pipeline route along the south pasture fences: 30-foot-wide corridor 3 to 10 feet deep between the pasture and the fence.
- Manhole location to Chewuch River intake: 60-foot-wide wide corridor 3 to 10 feet deep.
- River water supply pipeline, electrical conduit, and site access road.
- Construction staging area: 90- to 120-foot-wide area on the east side of the West Chewuch Road at the south end of the south pasture.
- Two alternative pond locations: the dimensions of each pond plus a buffer of 30 feet.
- Discharge pipelines: the length of each pipeline route plus a 30-foot buffer (15 feet either side of centerline).

The field inventory included previously surveyed portions of the Eightmile Ranch and a Civilian Conservation Corps (CCC) camp which was documented as a cultural resource site in 2001 (Gadd 2001).

The ranch (1911-present) was the original headquarters for the Winthrop Ranger District when that district was part of the Chelan National Forest. In 1920 it became part of the Okanogan National Forest, and today it is part of the administratively combined Okanogan-Wenatchee National Forest. In addition to 50 irrigated acres of livestock pasture and alfalfa, the site once included two residences and an office. In 1957 the residential structures were sold and removed from the site, and a barn and other outbuildings were constructed. Corrals, loading chutes, and fences have changed over time. The Boulder Creek CCC camp relocated to the south pasture of the administrative site in 1940-41 and closed in 1942. All that remains visually of the CCC camp are five concrete slabs and a concrete foundation, likely a remnant of a bathroom or bathhouse (Gadd 2013). During the 2013 survey, a single irrigation box was documented within the

[12] Criteria for eligibility are found at 36 CFR 60.4.

[13] Note that under the NHPA the analysis area is generally referred to as the "area of potential effects" or "APE". In this document it is referred to as the "analysis area" for consistency with other sections of the document.

corridor of the proposed groundwater supply pipeline in the south pasture of Eightmile Ranch. No other cultural resources were found.

Pending formal evaluation of the site in accordance with the NHPA (36 CFR 800), the site is managed as eligible for the National Register of Historic Places.

3.12.4 Environmental Effects and Mitigation

Proposed Action, Locations 1 and 2

The groundwater pipeline and electrical conduit, a manhole, the surface water intake, and the construction staging areas all would lie within the boundary of the historic site. Neither location under the Proposed Action is likely to adversely affect cultural resources because the historic features associated with Eightmile Ranch and the CCC camp would be avoided. Locations for the surface water and groundwater pipelines were identified in consultation with the Forest Service's Cultural Resource Specialist to avoid visible remnants of the CCC camp and irrigation features associated with Eightmile Ranch; however, dense vegetation prevented some areas from being surveyed or shovel-tested for the presence of cultural resources.

Both pond locations and associated discharge pipelines to the Chewuch River are outside and south of the historic site. Field surveys were not done in this area of the APE due to dense vegetation. Additionally, shovel tests were not done because they would not have been deep enough to determine the nature or extent of any cultural resource present. In lieu of a field survey, a cultural resource specialist would monitor the project as described in "Mitigation Measures" below.

In accordance with Section 106 of the NHPA, the agencies prepared a cultural resource report documenting the field inventory (Gadd 2013). BPA and the Forest Service shared the report with the the Confederated Tribes of the Colville Indian Reservation, the Yakama Nation, and the Washington State Historic Preservation Officer (SHPO). In a letter dated May 5, 2014, the SHPO concurred with the finding of no adverse effect, "with the stipulation for professional archaeological monitoring."

Mitigation Measures

Construction would be monitored by a cultural resources specialist to ensure that if any undocumented cultural resources are unearthed, work would be stopped until their significance is determined. This would be done in consultation with the Forest Service (which would follow its Cultural Resource Inadvertent Discovery Plan), BPA, Washington SHPO, the Yakama Nation, and the Confederated Tribes of the Colville Indian Reservation.

Specifically, a cultural resources specialist would monitor all subsurface project work within the boundary of Eightmile Ranch and the CCC camp where the potential remains high for subsurface historic debris and/or pre-contact cultural resources. A cultural resource specialist would also monitor construction at the selected pond location and along any associated electrical conduit and discharge pipeline corridors associated with the pond. Monitoring would involve inspection of backdirt and trench profiles as the excavator works and again prior to backfilling. During construction of the pond, all spoils and surface area would be inspected as vegetation is scraped away and removed;

inspection would continue to the depth of the excavation or until sterile glacial deposits are exposed, whichever comes first.

Regulatory Compliance

The National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470) as amended requires federal agencies to take into account the effects of their undertakings on cultural resources that are listed or eligible for listing on the National Register of Historic Places. The act is the foremost legislation that governs the identification and management of significant artifacts, archaeological and historic sites, traditional cultural properties and landscapes. Implementing regulations that clarify and expand upon the NHPA include 36 CFR 800 (Protection of Historic Properties), 36 CFR 63 (Determination of Eligibility to the National Register of Historic Places), and 36 CFR 296 (Protection of Archaeological Resources).

Consultation must occur with the State Historic Preservation Office, Indian tribes that attach religious and cultural significance to historic properties that may be affected by an undertaking, and additional consulting parties, regarding the inventory and evaluation of properties potentially eligible for National Register nomination, to determine whether the project would adversely affect them. The Washington SHPO, the Yakama Nation, and the Confederated Tribes of the Colville Indian Reservation were consulted at the initiation of the EA process; government-to-government discussions are ongoing with the Colville Tribes.

As discussed under "Environmental Effects" above, results of the cultural resource survey conducted at the proposed project site were shared with the above-named parties, and the SHPO concurred with the finding of no adverse effect, with the stipulation for "professional archaeological monitoring."

Archaeological Resource Protection Act

The proposed project is on U.S. Forest Service land and must follow the requirements of the Archaeological Resource Protection Act (ARPA) (16 U.S.C. 470aa-mm). ARPA sets requirements that must be satisfied prior to issuance of a permit by a federal agency which allows for the excavation and/or removal of archaeological resources from federal or Indian lands. The requirements generally pertain to the qualifications of the archaeologist(s) proposed to carry out the study, the proposed methodology to be employed, and the proposed treatment of any recovered cultural resources. Because the survey for the proposed project was conducted by a Forest Service cultural resource specialist, a permit was not required.

The Archaeological and Historic Preservation Act

The Archaeological and Historic Preservation Act (16 U.S.C. 469 - 469c) directs federal agencies to notify the Secretary of the Interior if they find that a federal action might cause the destruction of significant scientific, prehistoric, or archaeological data. As stated above, the cultural resource survey for the proposed project identified a historic irrigation box within the corridor of the proposed ground water supply pipeline in the south pasture of Eightmile Ranch. No other cultural resources were found. All visible features associated with the Eightmile Ranch and CCC camp site would be avoided. A cultural

resource specialist would monitor project work as it occurs, and would guide actions should additional resources be found.

Executive Order 13175, Consultation and Coordination with Indian Tribes

Executive Order 13175, Consultation and Coordination with Indian Tribes, states that the U. S. government will continue to work with Indian tribes on a government-to-government basis to address issues concerning tribal self-government, trust resources, and Indian tribal treaty and other rights. As mentioned above, government-to-government consultation is ongoing on this project and related issues in the Methow basin. The proposed Eightmile Ranch coho acclimation site, as a part of the Yakama Nation's Mid-Columbia Coho Restoration Program, would contribute to the spirit of intergovernmental cooperation and would help enhance the culturally significant tribal ceremonial and subsistence fishery for coho salmon in the Methow River basin and in the Columbia River below Wells Dam.

Okanogan Forest Plan (USDA/FS 1989), Forest Service Handbook, and Forest Service Manual

Pertinent forest-wide management standards include:

- Conduct a professionally supervised cultural resource survey on National Forest lands to identify cultural resource properties.
- Evaluate the significance of sites by applying the criteria for eligibility to the National Register of Historic Places (36 CFR 60).
- Consider the effects of all Forest Service undertakings on cultural resources. Coordinate the formulation and evaluation of alternatives with State and Federal agencies, and with Tribal Historic Preservation Officers (THPO) of American Indian tribes with historic ties to the project planning area.

As discussed in Sections 3.12.3 and 3.12.4, a professionally supervised cultural resource survey was conducted, the significance of the properties was evaluated, and the effects on the properties were considered during siting of the proposed project.

Programmatic Agreement 1997: U.S. Forest Service, Pacific Northwest Region (R6); Advisory Council on Historic Preservation (ACHP); and Washington State Historic Preservation Officer (SHPO)

This programmatic agreement establishes procedures for the management of cultural resources on National Forest system lands. It outlines specific procedures for the identification, evaluation, and protection of cultural resources during projects conducted on Forest Service lands. It also establishes the process that the SHPO uses to review Forest Service undertakings for NHPA compliance for every federally assisted, permitted, or approved undertaking.

In compliance with the agreement, cultural resource identification efforts in the project area included a field survey, a literature review, Geographic Information Systems (GIS) analysis, and consultation with American Indian tribes (Gadd 2013).

No Action Alternative

If the proposed project is not constructed, there would be no potential to adversely affect cultural resources at this site.

3.12.5 Cumulative Effects

Past and future Forest Service land management projects have the potential to cumulatively affect cultural resources within the proposed project area. Typical resource management activities can cause surface disturbance that could affect the integrity of National Register listed, eligible or potentially eligible cultural resources. However, because the Proposed Action is not expected to disturb cultural resources, it would not contribute to the cumulative impacts on cultural resources by other Forest Service land management activities at the site.

3.13 Air Quality and Noise

3.13.1 Information Sources

- Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012).
- EPA National Ambient Air Quality Standards.
- State of Washington Noise and Air Quality standards.

3.13.2 Analysis Area

The analysis area for air quality and noise effects includes the Eightmile Ranch site, West Chewuch Road, and the Chewuch River adjacent to the ranch.

3.13.3 Affected Environment

Air Quality

The Environmental Protection Agency (EPA) and the Washington Department of Ecology (WDOE) both have responsibility for air quality in the State of Washington. The EPA has established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution (42 U.S.C. 7401 *et seq.*). The NAAQS focus on "criteria pollutants," which are pollutants of particular concern for human health. The criteria pollutants include carbon monoxide, lead, ozone, nitrogen dioxide, sulfur dioxide, and particulates.

In addition to the NAAQS, the WDOE has established State Ambient Air Quality Standards (SAAQS) that are at least as stringent as the NAAQS. The proposed project is in an area that is in attainment with the NAAQS (EPA 2010). This means that the concentrations of criteria pollutants in the area are historically below (in attainment with) the thresholds described in the NAAQS.

Noise

The Washington State Administrative Code defines categories of properties based on their sensitivity to noise. "EDNA" means the environmental designation for noise abatement: an area or zone (environment) within which maximum permissible noise levels are established (WAC 173-60-020). Table 3-11 shows permissible noise levels for the three classes of property defined in the code. Classes of property are defined below (not all examples from the code are listed) (WAC 173-60-030).

Table 3-11. Maximum permissible noise levels measured as A-weighted decibels (dBA) at three classes of property [14]

EDNA of Noise Source	EDNA of Receiving Property		
	Class A	Class B	Class C
Class A	55 dBA	57 dBA	60 dBA
Class B	57 dBA	60 dBA	65 dBA
Class C	60 dBA	65 dBA	70 dBA

Class A EDNAs are lands where human beings reside and sleep. Typically, Class A properties include single- and multiple-family residences, and recreational and entertainment properties where people sleep, such as camps, parks, camping facilities, and resorts.

Class B EDNAs have uses requiring protection against noise interference with speech—generally commercial establishments such as office buildings, restaurants, and entertainment facilities not designed for human habitation, fairgrounds and amusement parks, or community services property not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).

Class C EDNAs are lands involving economic activities for which higher noise levels than experienced in other areas would normally be expected, including warehouses and distribution centers, agricultural lands raising crops or livestock, and manufacturing facilities.

The noise limits shown in Table 3-11 have a few modifications or exceptions that are relevant to this project:

- In general, between the hours of 10:00 p.m. and 7:00 a.m. the noise limitations shown in the table must be reduced by 10 dBA for receiving properties within Class A EDNAs.
- Noise limits may be exceeded at any time during the day or night for brief periods of from 1.5 to 15 minutes, depending on the decibel level.
- Construction noise from temporary construction sites may exceed noise limits except between the hours of 10 p.m. and 7 a.m. at Class A EDNAs.

The Eightmile Ranch site is difficult to classify under these definitions. Although it could be considered agricultural land raising crops or livestock, it is not at the industrial level implied in the state code. Although the site is not a campground (which would make it a Class A EDNA), it is in a recreational area where many users would be sensitive to noise.

[14] "dBA" means the sound pressure level in decibels measured using the "A" weighting network on a sound level meter. Decibels are usually measured with a filter that emphasizes sounds in certain frequencies. The "A" filter (dBA) is the one most frequently used. The "C" filter (dBC) puts more weight on low-frequency sounds such as the bass in amplified music.

3.13.4 Environmental Effects

Proposed Action, Locations 1 and 2

Construction

Air Quality: Other than vehicle emissions, the primary potential air quality impact from construction of project facilities would be dust. Cleared vegetation would not be burned, so smoke and particulate pollution would not be created by the proposed project. Dust abatement measures would be used during construction as necessary (see Section 3.13.5).

Noise: The sound produced by conventional construction equipment typically ranges from about 75 to 90 decibels (dB): 78 dB for a dump truck, 80 dB for an excavator, 85 dB for a backhoe, and 87 dB for a bulldozer (LHSFNA 2009).

The intensity of sound attenuates, or diminishes, by about 7.5 dB as distance doubles, where vegetation is present to absorb noise. Atmospheric conditions and topography also strongly influence attenuation. The zone of effect is considered to extend from the source of the noise to the point at which the noise attenuates to ambient levels. Ambient noise levels at the project site are unknown; however, rural areas typically have an ambient noise level of 35 to 40 dB (WSDOT 2007). A variety of site conditions would contribute to noisier than typical background noise for rural areas, such as the presence of roads or highways and streams and rivers located near or adjacent to the sites. In this case, the site has both a road and a river that could contribute to higher ambient noise levels at certain times of the year. Construction noise might be noticeable to recreational users of the Chewuch River, but as discussed in Section 3.11, the severity of the impact would depend on the amount of time the affected person is in the vicinity of the work and their sensitivity to noise in the natural setting. These effects would be temporary, occurring only intermittently during the construction period.

Thus, the impacts on air quality and noise from construction of the Proposed Action likely would be low.

Operations

Air Quality: There would be no effects on air quality at the site during operations. The acclimation site would be operated during spring months when the ground is moist and dust from vehicles on unpaved areas would not be created. In addition, the site would be visited by project staff only once or twice a day during the 2-month acclimation period.

Noise: The primary source of noise during operations would be from a compressor that is part of a system that uses compressed air to move debris off the intake screen. Sensors monitor the difference between water levels in front of and behind the screen. When the difference reaches a predetermined value, an electric valve releases air from an accumulator that is sent to the manifold behind the screen. The air rising out of the manifold moves debris off the screen. The system would operate only when significant amounts of debris clog the screen. Only functional experience will allow an accurate prediction of how often this would occur; however, it is estimated that equipment normally would operate once a day, but more frequently during high flow events. The compressor would run for about 15 minutes per operation. It would be mounted inside the manifold, which would reduce noise. It is expected that noise associated with facility

operations would be within state-approved environmental noise regulations for Class A EDNAs (Table 3-11).

Thus, the impacts on noise and air quality from operation of the Proposed Action likely would be low.

No Action Alternative

If the acclimation facilities are not constructed, there would be no change to existing air quality and noise at Eightmile Ranch.

3.13.5 Mitigation Measures

Air Quality

Dust abatement measures would be used as necessary during construction to minimize the effects of dust on users of West Chewuch Road and the Chewuch River and on operations at the ranch site. They would be implemented considering soil type, equipment used, prevailing wind direction, and the effects of other erosion and sediment control measures. Specific measures include the following:

- Work would be sequenced and scheduled to reduce the amount of bare soil exposed to wind erosion.
- Dust-abatement additives and stabilization chemicals (typically magnesium chloride, calcium chloride salts, or ligninsulfonate) would not be applied within at least 25 feet of the river channel (distances might be greater where vegetation is sparse) and would be applied so as to minimize the likelihood that they would enter the river.
- Petroleum-based products would not be used for dust abatement.
- Application of dust abatement chemicals would be avoided during or just before wet weather, and in areas that could result in unfiltered delivery of the dust abatement materials to the river.
- Spill containment equipment would be available during application of dust abatement chemicals.
- Motorized equipment used for construction and operation would be maintained to minimize emissions.

Noise

- To avoid or minimize noise during construction, all activity would be limited to normal workday hours of 8:00 a.m. to 5:00 p.m., Monday through Friday.

3.13.6 Regulatory Compliance

Clean Air Act

Emissions produced by construction and operation of the proposed project facilities must meet standards of the Clean Air Act and the amendments of 1970 (42 U.S.C. 7401 *et seq.*). In Washington, the authority for ensuring compliance with this act is delegated to WDOE. The Proposed Action would not violate current clean air standards, as described in Section 3.13.2.

Noise Control Act of 1972

The Noise Control Act of 1972 (42 U.S.C. 4901 *et seq.*) promotes an environment free from noise that jeopardizes human health and welfare. Federal and state regulations establish guidelines that implement the intent of the act. No local noise standards exist for the area affected by the Proposed Action, although county comprehensive plans have policies related to noise. No noise in excess of state or federal standards is expected from this project. Temporary construction noise during daylight hours is exempt from state and federal standards.

3.13.7 Cumulative Effects

For the Mid-Columbia Coho Restoration Program as a whole, the Final EIS concluded that the largely minor and short-term increases in dust and construction noise would not add to the cumulative long-term impacts to air quality and noise from increased development and population levels in the two basins. Therefore, one acclimation site of the 24 proposed for the program as a whole would not add cumulative effects on noise and air quality.

3.14 Socioeconomics

The benefits and adverse effects of the overall coho restoration program on population levels, employment, infrastructure, and cultural values were assessed in the Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012). Other than the cultural benefits derived from restored coho populations in the Wenatchee and Methow basins, the benefits and adverse impacts of the entire program, which included a new hatchery and 24 acclimation sites, were found to be low. Therefore, the direct, indirect, and cumulative impacts and benefits of construction and operation of one acclimation site would similarly be low for both locations under the Proposed Action and are not analyzed further in this EA.

3.15 Climate Change

The impacts of the entire coho restoration program on climate change were found to be minimal (USDOE/BPA 2012); therefore, the direct, indirect, and cumulative effects of construction and operation of one acclimation site among 24 would similarly be minimal and therefore are not analyzed further in this EA.

3.16 Other Consultation/Compliance Issues

This section addresses other consultation and compliance issues that are not discussed under the specific resource analyses in the previous part of this chapter.

3.16.1 National Environmental Policy Act

The National Environmental Policy Act of 1969 as amended (42 U.S.C. 4321 *et seq.*) requires federal agencies to assess and disclose the effects of proposed actions on the environment before making a decision to proceed. This EA has been compiled to meet NEPA requirements.

BPA and the Forest Service wrote to interested and potentially affected parties, who identified issues to be considered in the environmental analysis (see Chapter 1, Section 1.6). This draft EA is being sent to regulatory agencies and other interested organizations

and individuals for review and comment (see Chapter 5) for a 30-day review. BPA and the Forest Service will consider all comments and make additions, corrections, or clarifications to the analysis, if necessary, in the final EA. BPA and the Forest Service will document their final decisions in separate decision documents. The timing of these decisions would vary based on each agency's NEPA regulations.

3.16.2 Northwest Forest Plan, Aquatic Conservation Strategy

The Aquatic Conservation Strategy (ACS) is an integral part of the Northwest Forest Plan (USDA/FS and USDI/BLM 1994) that was developed to restore and/or maintain the ecological health of watersheds and aquatic ecosystems within public lands. The ACS has nine objectives (USDA/FS and USDI/BLM 2001: B-11) toward meeting the goal of healthy ecosystems and watersheds. This section addresses the ability of the Proposed Action to meet ACS objectives.

(1) Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

On a watershed level and landscape level, the proposed project would not substantially or permanently alter the aquatic or riparian habitats on which species, populations, and communities depend. However, Location 1 would convert an 8,000-square-foot wetland to an open pond for at least 20 years. See Section 3.5.

(2) Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

The Proposed Action would not disturb the spatial or temporal connectivity within the Chewuch watershed. Water withdrawals from the Chewuch River would not reduce migration rates in the affected reach because the project would use mitigating measures to maintain the minimum instream flows required for fish passage.

(3) Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

The water intake and outlet for the proposed acclimation pond would not alter the river bed and would permanently remove only 160 square feet of river bank (Table 3-1), which would not affect the physical integrity of the Chewuch River system.

(4) Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

Water quality would be maintained by using best management practices during construction to limit erosion and increased sediment in the river, as described in Section 2.5. Discharges from the acclimation pond would be limited to a 2-3 month period in spring when river flows are high and would not adversely affect water quality in the river. See Section 3.4. Any riparian vegetation disturbed during construction of the intake

would be replanted. Grette Associates (2013) rated Wetland B as having a moderate water quality value based on the *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004). While Location 1 would remove that wetland and its water quality functions, for either location alternative, water quality in the river would remain within the range that maintains the characteristics that benefit aquatic and riparian communities.

(5) Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Any minor impairment to water quality due to sediment from construction or operation of the Proposed Action would be temporary; no significant or permanent change to the sediment regime would be caused by the Proposed Action at either location. See Section 2.5.

(6) Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

The withdrawal of 4.6 cfs of water from the Chewuch River to supply the proposed acclimation pond would take place for a period of 2-3 months during spring flows, and represents less than 10% of the river's average spring flows recorded within the last 10 years. State of Washington minimum instream flows are defined in Washington Administrative Code (WAC) 173-548-020. Mitigation measures applied during low-flow periods would ensure that minimum instream flows are maintained. See Section 3.3.

(7) Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

The Proposed Action would not adversely affect these functions. See Section 3.5.

(8) Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

The Proposed Action at Location 1 would not meet this objective locally. A small wetland would be turned into a pond for at least the next 20 years, although the primary effect would be loss of species composition and structural diversity of plant communities in a small corner of the Eightmile Ranch site. The loss of the values provided by this wetland is unlikely to be significant on a regional basis.

Location 2 would be consistent with this objective because wetlands would not be affected.

(*9) Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species.*

The acclimation pond would help enhance the distribution of coho salmon in the Chewuch basin.

3.16.3 State Environmental Policy Act

The State Environmental Policy Act (SEPA), Washington State's most fundamental environmental decision-making law, was enacted in 1971 as chapter 43.21C Revised Code of Washington. Much like the federal National Environmental Policy Act, SEPA is designed to provide decision-makers and the public with impartial information about a project and analyze alternatives to the proposal, including ways to avoid or minimize adverse impacts or to enhance environmental quality. Information provided during the SEPA review process helps decision-makers understand how a proposal would affect the environment and identify measures to reduce likely effects, or deny a proposal when adverse effects are identified. As Washington State's lead agency to implement SEPA for the Mid-Columbia Coho Restoration Program, Okanogan County participated in development and review of the program's EIS (USDOE/BPA 2012), and adopted the EIS in a document dated June 27, 2012, in fulfillment of SEPA requirements.

Okanogan County has discussed the scope and impacts of the Proposed Action as presented in this EA with BPA and the Forest Service, and is expected to continue to do so. The county might adopt this EA to fulfill SEPA requirements.

3.16.4 State, Area-wide, and Local Plans and Permits

Methow Subbasin Plan

Early in this century, plans addressing use and preservation of natural resources in all Columbia River subbasins were prepared under the auspices of the Northwest Power and Conservation Council. Preparation of these plans was done by federal, state, and local agencies, including county planning departments, and by Indian tribes. Restoring extirpated fish and wildlife is a specific goal of the Methow Subbasin Plan: "The goal for coho salmon includes re-establishment of run sizes that provide for species recovery, mitigation of hydro-system losses, and harvestable surpluses." (NPCC 2004) The proposed project would contribute to meeting the goals of the Methow Subbasin Plan.

Okanogan County Comprehensive Plan

The Okanogan County Comprehensive Plan is currently being amended, with adoption of amendments by the Okanogan County Planning Commission pending. The Eightmile site is in the Methow Review Unit and designated Rural. While fish acclimation sites are not a specifically permitted activity in either High or Low Density Rural Lands, they are not a prohibited use (http://www.okanogancounty.org/planning/index.html).

This EA will be submitted to Okanogan County for review, consistent with the comprehensive plan's Policy #4, which recognizes that federal agencies must coordinate their proposed actions with local governments, and in the county's role as the lead agency for review under SEPA.

Permitting Issues

Various federal, state, and local permits and approvals would be required to construct and operate the proposed acclimation facility. Because the acclimation pond is a water-dependent use, water rights and in-water work permits are required.

Instream construction requires a Hydraulic Project Approval from Washington State, which would specify when in-water work can occur and what measures would be needed to protect fish and fish habitat.

A Shoreline Substantial Development Permit may be required from Okanogan County and Chelan County (under authority delegated by WDOE) for working within 200 feet of a waterway. These permits would stipulate conditions for near-water construction activities. Okanogan County may also require an approval to allow construction within a designated floodplain to assure that appropriate design measures are included.

3.16.5 Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act (TSCA) and Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)

The Resource Conservation and Recovery Act (42 U.S.C. 6901 *et seq.*) regulates the disposal of hazardous wastes. The Toxic Substances Control Act (15 U.S.C. 2601-2692) gives authority to the EPA to regulate substances that present unreasonable risks to public health and the environment. The Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. 136 (a-y)) authorizes the EPA to prescribe conditions for use of pesticides.

Construction, operation, and maintenance of the proposed facilities would meet the guidelines for use, handling, storage, and disposal of hazardous substances. Regulated pesticide products would not be used.

3.16.6 Environmental Justice

Executive Order 12898 directs federal agencies to consider the effects of their programs, policies and activities on minority and low-income populations, which are protected under the executive order from disproportionate adverse effects of federal projects. Federal agencies are required to assess environmental justice concerns in the NEPA analysis.

The Mid-Columbia Coho Restoration Program EIS (USDOE/BPA 2012) evaluated compliance with this executive order and concluded that the entire program would have no disproportionate adverse effect on minority or low-income populations, so the Proposed Action, as a subset of the full program, would likewise not have such effects.

3.16.7 Energy Conservation at Federal Facilities

Executive Order 13514 states that federal agencies should "*[identify] and [analyze] impacts from energy usage and alternative energy sources in all Environmental Impact Statements and Environmental Assessments for proposals for new or expanded Federal facilities under the National Environmental Policy Act of 1969, as amended (*42 U.S.C. 4321 *et seq.)."*

No new buildings or major energy-consuming equipment are part of the Proposed Action, so opportunities to conserve energy would be limited. The Yakama Nation would own and operate the facilities, so the Tribe would ultimately make final decisions for the facility designs and operations. However, BPA could use contractual mechanisms through its funding agreement with Yakama Nation to encourage design and operation practices in the manner described in EO 13514.

3.16.8 Inventoried Roadless Areas and Potential Wilderness

The project not located within an Inventoried Roadless Area or an area identified as potential wilderness.

3.16.9 Intentional Destructive Acts

According to Department of Energy NEPA implementing procedures, environmental assessments must explicitly address the potential environmental consequences of intentionally destructive acts (such as acts of sabotage or terrorism). This applies to all Department of Energy proposed actions, including both nuclear and non-nuclear proposals.

There is an extremely low risk that the Eightmile Ranch coho acclimation site would become the target of sabotage or terrorism, because the action is not of a highly sensitive, political, or controversial nature. Additionally, the site would not be highly visible, because it would be screened from both the road and the river.

However, if intentional destructive acts were to occur, these acts would probably be limited to vandalism of the site's hardware, such as the PIT-tag array, electrical power supply, aerator, surface-water intake, or discharge pipe. There is no risk that hazardous materials would be stolen or released, as such materials would not be present at the site. Environmental effects would be limited to minor earth disturbance or limited turbidity in the Chewuch River until the time that any vandalized hardware could be repaired.

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CHAPTER 5. AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED TO RECEIVE EA

Federal Agencies

National Marine Fisheries Service

U.S. Fish and Wildlife Service

Environmental Protection Agency Region 10, Env. Review; Seattle, WA (Christine Reichgott)

U.S. Army Corps of Engineers

State Agencies

Washington Dept. of Nat. Resources/For. Health Policy, Olympia, WA (Aaron Everett)

Washington Dept. of Natural Resources, Colville, WA (Chuck Johnson)

Washington Dept. Fish & Wildlife, Twisp, WA (Lynda Hoffman)

Washington Dept. of Ecology, Yakima, WA (Sean M. Hopkins)

Washington State Department of Archeology and Historic Preservation, Olympia, WA (Dr. Robert Whitlam, State Archaeologist)

Local Government

Brenda Crowell, Okanogan County Commissioners, Okanogan, WA

Tribes

Yakama Nation Environmental Management, Toppenish, WA (Kristina Proszek)

Johnson Meninick, Confederated Tribes and Bands of the Yakama Nation, Toppenish, WA

Guy Moura, Confederated Tribes of the Colville Reservation, Nespelem, WA

Organizations

MV Snowmobile Assoc., Winthrop, WA

N. Cascades Conservation Council, Seattle, WA

Sun Mountain Lodge, Winthrop, WA

The Mountaineers, Seattle, WA

Rendezvous Huts Inc., Winthrop, WA

The Wilderness Society, Seattle, WA (Cynthia Wilkerson)

WA Wilderness Coalition, Seattle, WA

PNW 4 Wheel Dr. Assoc., Auburn, WA (Arlene Brooks)

Pacific Biodiversity Institute, Winthrop, WA (Peter Morrison)

MV Sports Trail Assoc., Winthrop, WA (James DeSalvo)

Conservation NW, Bellingham, WA (Dave Werntz)

Sierra Club Cascade Chapter, Seattle, WA (Mark Lawler)

Loup Loup Ski Ed. Foundation, Okanogan, WA

Methow Valley News

Rendezvous Huts Inc., Winthrop, WA

Maesner Jr. Family Trust, Freeland, WA

Smith, Gwin & Florene Trust; Seattle, WA

Individuals

Allard, Gary; Okanogan, WA
Artley, Dick; Grangeville, ID
Banasky, Mort; Winthrop, WA
Bernheisel, Lee; Carlton, WA
Boesel, Craig; Winthrop, WA
Brannon, Jerry
Breed, Ralph & Linda; Port Orchard, WA
Brewer, Ron and Shari; Darrington, WA
Burgess, Bill; Leavenworth, WA
Burkhart, Aaron L.; Winthrop, WA
Cherrington, Howard; Twisp, WA
Campbell, Steve; Winthrop, WA
Campbell, Joyce; Carlton, WA
Christensen, Greg; Bellingham, WA
Christianson, Chris; Twisp, WA
Crampton, Susan; Twisp, WA
Daniels, Ted; Edmonds, WA
Daussin, Greg; Sandy, UT
Dilley, Charles & Mary; Sedro Woolley, WA
Dittrich, Lucinda Jann & Rick; Twisp, WA
Dorsey, Howard E. Jr.; Stanwood, WA
DuLac, Dalton & Linda; Winthrop, WA
Dunn, Michael; Twisp, WA
Enfield, Linda J.; Ferndale, WA
Ewing, James & Susan; Arlington, WA
Firth, Matt; Twisp, WA
Ford, Bill & Jan; Twisp, WA
Fluharty, David; Seattle, WA
Fuller, Roy & Sue; Twisp, WA
Gebbers, Dan; Brewster, WA
Gildnes, Erik; Sedro Woolley, WA
Gould, Arthur & Martha; Bellingham, WA
Gregg, Jim; Winthrop, WA
Hall, Martha; Anacortes, WA
Haring, Richard & Judith; Marysville, WA
Hays, Jerry & Ruth; Lynnwood, WA
Hebert, Joe & Carol; Twisp, WA
Henry, Ann; Twisp, WA
Houser, Ray; Sedro Woolley, WA
Hudson, Ed & Dorothy; Tacoma, WA
Hutson, Dwain; Twisp, WA
Imes, Hugh; Winthrop, WA
Jennings, Scott; Seattle, WA
Johnson, Donald W.; Carlton, WA
Knott, Greg; Twisp, WA
Larsen, Mary Pat; Concrete, WA
Lester, John; Okanogan, WA
Leuenberger, James & Sherry; Bellingham, WA
Leuenberger, Troy; Mount Vernon, WA
Lindell, Arthur & Sandra; Camano Island, WA
Lloyd, Bob; Twisp, WA
Maples, Jean; Twisp, WA
Mellana, John & Sue; Seattle, WA
Millam, Phil; Winthrop, WA
Miller, Carl & Roxie; Winthrop, WA
Miller, Darrell & Mary; Seattle, WA
Morrison, Bruce; Twisp, WA
Niepoth, Thomas & Linda; Winthrop, WA
Nyman, Fred, Sierra Pacific Industries; Mt. Vernon, WA
O Brien, Francis; Edmonds, WA
O'Callaghan, Dennis; Winthrop, WA
Ohlson, Pete and Therese; Twisp, WA
Pedersen LLC; Sedro Woolley, WA
Portman, Don; Winthrop, WA
Potter, Paul B; Seattle, WA
Prewitt, Dr. Charles; University Place, WA
Remsberg, Theresa; Twisp, WA
Rosenbach, Michael; Stanwood, WA
Ruoss, Shane; Winthrop, WA
Russell, Katie; Twisp, WA
Rust, Ben; Winthrop, WA
Sabold, David; Winthrop, WA
Salisbury, Mark & Kathy; Bellingham, WA
Schneider, Dick; Winthrop, WA
Scott, Michael; Seattle, WA
Sill, Rick A.; Stanwood, WA

Snover, Kurt; Winthrop, WA
Solie, Raymond & Lilah; Lynnwood, WA
Sorom; Terry A.; Wenatchee, WA
Spivey, Philip & Tricia; Seattle, WA
Strand, Eddie & Mary; Arlington, WA
Thurlow, Dr. Bernard; Twisp, WA
Tom; tom@wawild.org
Van Winkle, Genevieve; Kennewick, WA
Vande Griend, Kimberly; Edmonds, WA
Vannice, Jim; Twisp, WA
Vogle, Sharon; Bothell; WA
Wagoner, Betty; Carlton, WA
Welch, Ed & Vicki; Twisp, WA
White, Don; Winthrop, WA
White, Fran; Twisp, WA
Whittemore, Deborah & Ted; Twisp, WA
Wooten, George; Twisp, WA
Wrangle, Richard; Carlton, WA

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APPENDIX 1: ACCLIMATION POND—OPTION 1: INSTALLATION AND POST-PROJECT REESTABLISHMENT PLAN

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MID-COLUMBIA COHO RESTORATION PROJECT

ACCLIMATION POND – OPTION 1
INSTALLATION AND POST-PROJECT REESTABLISHMENT PLAN
EIGHTMILE SITE – OKANOGAN COUNTY, WA

PREPARED FOR:

CORY KAMPHAUS
YAKAMA NATION – MID-COLUMBIA COHO RESTORATION PROGRAM
7051 HIGHWAY 97
PESHASTIN, WA 98847

PREPARED BY:

GRETTE ASSOCIATES[LLC]
151 S. WORTHEN STREET, SUITE 101
WENATCHEE, WA 98801
(509) 663-6300

MARCH 2014

Grette Associates[LLC]
ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

1 INTRODUCTION

The Yakama Tribe of Indians is working to establish a locally adapted and self-sustaining population of Coho Salmon (*Oncorhynchus kitsutch*) in the Mid-Columbia basin. These efforts are known as the Methow Natural Production Implementation Phase of the Mid-Columbia Coho Reintroduction Project (MCCRP) and are being conducted throughout the Methow and Wenatchee Basins. The MCCRP includes plans for Coho smolt acclimation and release at approximately 11 locations in the Methow watershed. This document addresses project activities that are proposed at Eightmile Ranch, a United States Forest Service owned property. The Eightmile ranch site is located along the Chewuch River in the Okanogan National Forest in Okanogan County in Section 26, Township 36, Range 21 East, W.M.; latitude 48.592, longitude -120.165 (Sheet 1).

The major project elements associated with the construction and use of the acclimation pond at the Eightmile Ranch site are as follows: grading and excavation of the project area, the installation of a surface water intake and supply pipeline, a ground water supply pipeline, a smolt acclimation pond, and a discharge line down to the river (Sheet 3). Approximately 200,000 smolts would be acclimated within the proposed pond and released from the site, entering the Chewuch River at River Mile (RM) 10.3.

The Yakama Tribe has contracted with Grette Associates^{LLC} to provide an Acclimation Pond Installation Planting Plan and Post-Project Vegetation Community Plan (Plan) for the Eightmile Site Project Area. This plan provides both a project planting design to be installed after construction of the acclimation pond is completed as well as a reestablishment planting design to return the site to pre-construction conditions, i.e. those that currently existing on site, after MCCRP objectives have been met and the acclimation pond has been removed. To facilitate project success and promote the establishment of a cohesive site, both the acclimation pond and post-project reestablishment planting designs utilize plant species that currently exist within and adjacent to the project boundaries as determined during recent plant studies (Grette Associates 2012a) and wetland delineations (Grette Associates 2012b) as well as on-going riparian native plant restoration efforts (Yakima Nation 2012).

2 PROJECT AREA CHARACTERISTICS

The project area is located within an upland terrace area directly adjacent to the Chewuch River. Vegetation within the project area is comprised of two communities, a large herbaceous community and smaller area of forested community (Sheet 2). These communities are separated by an existing dirt road and fence, with the grassy herbaceous community to the northwest and the forested community to the southeast.

The herbaceous community includes multiple grass species such as Idaho fescue (*Festuca idahoensis*), Blue wildrye (Elymus glaucus), and Secar Bluebunch wheatgrass (*Pseudoroegneria spicata*). Black cottonwood (*Populus balsamifera ssp. trichocarpa*) and Ponderosa pine (*Pinus ponderosa*) are the dominant forest community species with

additional tree/shrub species such as mountain alder (*Alnus incana*), Douglas hawthorn (*Crataegus douglasii*), Pacific willow (*Salix lucida var. lasiandra*), Bebb's willow (*S. bebbiana*), and red osier dogwood (*Cornus sericea*) interspersed. The forested community also includes a well-established understory of subshrubs and forbs, which is dominated by snowberry (*Symphoricarpos albus*), showy aster (*Eurybia conspicua*), and various grasses and sedges. No rare plant species as listed by the Washington State Department of Natural Resources were identified in the project area (Grette Associates 2012a).

The project area, as well as land directly adjacent to the project area, has been reviewed for the presence of wetlands. The Eightmile Site-Coho Acclimation Pond Project: Wetland Delineation Report (Grette Associates 2012b) identifies two wetlands, A and B, within the project area boundaries. Wetland A is a riverine emergent temporarily flooded wetland, comprising 1,229 square feet, and is located within the southwestern portion of the study area directly adjacent to the Chewuch River. Wetland B is a depressional, Palustrine Forested, seasonally flooded wetland approximately 8,020 square feet in size. Wetland B is located approximately 230 feet north of Wetland A (Sheet 2).

3 PROJECT DESCRIPTION

The Yakama Tribe proposes to construct a new Coho Acclimation pond adjacent to the Chewuch River and within the boundaries of the Eightmile Ranch property. The pond will serve as a semi-natural rearing and acclimation area for juvenile Coho salmon and is part of a larger effort to reestablish Coho salmon within the Wenatchee and Methow basins. The proposed acclimation pond construction includes the installation of a screened surface water intake and supply pipeline, a groundwater supply pipeline, the smolt acclimation pond and a gated discharge pipe connecting the pond to the Chewuch River (Sheet 3). Total project area is approximately 66,900 square feet (1.54 acres).

Project construction will require grading and excavation within portions of the existing forested and herbaceous communities. The proposed acclimation pond will be constructed within the existing forested community area and within the delineated boundaries of Wetland B (Sheet 3). Soils excavated to place the intake and dispersal will be used to backfill the intake and dispersal pipe trenches. Soils removed from the wetland to construct the acclimation pond will be used to created berm around the acclimation pond. Any unused soil will be removed from the project area.

After construction of the pond and associated intake and dispersal pipes is completed, the project area will be planted to stabilize the site, minimize erosion, and support acclimation pond function. The area surrounding the acclimation pond will be planted with forested vegetation. Two- to three-man rocks and large woody debris (LWD) will be interspersed through the planting area around the pond to create a more natural visual appearance to the acclimation pond. The acclimation pond will also be fenced to prevent fish predation. However, the fencing shall be of an earthen brown tone that will be more camouflaged against the planted vegetation than. All other areas disturbed as a result of this project will

be planted with corresponding pre-construction vegetation community species in order to resume site habitat the greatest extent possible.

Juvenile Coho smolts would be placed into the operational pond by the Tribe for acclimation. After the acclimation season is completed, the screen to the discharge pipe would be removed and the fish would be allowed to migrate into the river.

Once the biological objectives and metrics established within the Mid-Columbia Coho Restoration Program Master Plan have been accomplished, the tribe proposes to remove the pond and reestablish pre-construction conditions within the project area. As such, this document also addresses the re-establishment of currently existing site conditions once the acclimation pond is removed (Chapter 5). Current projections indicate that restoration metrics will be accomplished by 2028.

4 POST-CONSTRUCTION PLANTING DESIGN

Approximately 8,020 square feet of wetland, 47,200 square feet of herbaceous community, and 19,200 square feet of forested community will be temporarily disturbed by construction activities. This chapter address how specific elements of the project area will be planted post construction as well as associated project goals, monitoring strategies, contingency planning, and reporting requirements.

4.1 Planting Zones

4.1.1 Acclimation Pond/Forested Community

The Acclimation Pond/Forested Community has a total area of 19,200 square feet and is comprised of two distinct sub-zones. The sub-zones are summarized as follows:

- An open water smolt acclimation area (approximately 15,000 square feet). No planting will occur within this sub-zone;
- A forested perimeter (approximately 4,200 square feet) located around the pond and over the dispersal pipe.

Proposed plantings for the forested perimeter are described in Tables 1 and 2 provided as follows and depicted on Sheets 4 and 5:

Table 1: Herbaceous species

Plant Species	Quantity
"Durar" Hard Fescue (*Festuca trachyphylla*)	50%
"Covar" Sheep Fescue (*Festuca ovina*)	30%
Sandberg Bluegrass (*Poa secunda*)	10%
Idaho Fescue (*Festuca idahoensis*)	10%
Yarrow (*Achillea millefolium*)	0.15 lbs/acre

Table 2: Forested Species

Plant Species	Size	Spacing
Mountain Alder (*Alnus incana*)	1 gallon	5' o.c.
Water Birch (*Betula occidentalis*)	1 gallon	5' o.c.
Red Osier dogwood (*Cornus stolonifera*)	1 gallon	5' o.c.
MacKenzie's Willow (*Salix prolixa*)	Cutting/stakes	3' o.c.
Pacific Willow (*Salix lucida var. lasiandra)*	Cutting /stakes	3' o.c.

As noted in the project description, two- and three-man rocks and large woody debris will be interspersed throughout the forested planting area immediately adjacent to the acclimation pond to provide a more natural appearance to the pond area.

Fencing is required around the pond to prevent fish predation. However, the installed fencing shall be of an earthen brown tone in order to more effectively blend with the natural environment.

4.1.2 Herbaceous Community Reestablishment

After project installation, the remainder of the site not planted pursuant to the forested planting schedule 47,200 square feet will be re-established as herbaceous community. A minimum of four inches of surface soils on the horizontal plane will be decompacted to provide a proper seed bed. Soil amendments, if necessary, may also be added at this time as needed to support plant growth. An herbaceous seed mixture, as described in Table 4, will be dispersed over the area.

Table 3: Acclimation Pond Installation: Herbaceous Community

Plant Species	Quantity
Secar Bluebunch wheatgrass (*Pseudoroegneria spicata*)	30%
Mountain brome (*Bromus carinatus*)	30%
Blue Wildrye (*Elymus glaucus*)	30%
Idaho fescue (*Festuca idahoensis*)	10%
Yarrow (*Achillea millefolium*)	0.15 lbs/acre

This seed mixture will be applied at a rate of 20 pounds per acre. If necessary, seeded areas will be lightly raked to maximize seed-soil contact.

4.2 Goals and Objectives

The primary goals of this Planting Plan are to establish plantings around the acclimation pond to (1) improve the pond's functionality by establishing habitat supporting vegetation around the perimeter of the pond and (2) reestablish the pre-project vegetation communities within all other portions of the project area. These goals will be met through the following project objectives:

- Clear and grade the project area according to the grading plan
- Plant the perimeter of the proposed acclimation pond with emergent and forested vegetation and provide vehicle access.

- Plant the areas disturbed by the project with herbaceous and forested plant species as suitable for the pre-project vegetation community.
- Monitor the establishing vegetation communities within the project boundaries to ensure compliance with performance standards.

4.3 Performance standards

The following performance standards are based on the objectives stated in Section 4.2 of this document:

1. Clear, grade and prepare the project site 66,900 square feet (1.53 acres).
2. Install project components including surface water intake and pipe, acclimation pond and dispersal pipe.
3. Reestablish 4,200 square feet (0.10 acres) of forested community vegetation within the project area.
4. Reestablish 47,200 square feet (1.08 acres) of herbaceous community vegetation within the project area.
5. Provide temporary irrigation to all plant areas for at least one growing season or as deemed necessary.
6. A minimum of 80 percent survival of installed plant species will be present in the pond planting area at the end of years 2 through 5.
7. Volunteer native species will be included as acceptable plants within the planted areas and included for plant success.
8. Areal coverage by invasive species shall not exceed 10 percent at the end of Monitoring Years 2 through 5. In the event that field review results in the determination that 10 percent invasive areal coverage is exceeded, invasive species will be removed mechanically in order to meet this standard.

4.4 Assumptions

Success of the proposed plantings associated with the project is based on several assumptions:

- Temperature and precipitation will be within normal ranges.
- unforeseen natural events, such as floods, earthquakes, and tornadoes, will not impact the site,
- vandalism will not occur,
- animal damage will be minimal, and
- all plant materials will be readily available.

4.5 Post-Construction Inspection

The post-construction inspection will consist of evaluating the plantings immediately after installation to confirm the planting plan was followed and the plants were installed

appropriately. Planting of the project areas shall be completed after construction occurs and by the end of October, before the winter dormancy period begins.

Photo points will also be established during the post-construction inspection and will be marked in the field. These points will be utilized for monitoring and documenting the development of restored vegetation over the course of the long-term monitoring period.

Following completion of the post-construction monitoring, a summary technical memorandum will be prepared demonstrating compliance with this riparian planting plan and verifying that all design features have been correctly implemented. Any changes to the planting plan will also be discussed in the compliance memorandum. This plan will be submitted to regulatory staff for review.

4.6 Long-term monitoring

Long-term monitoring will be conducted over a five year period with monitoring visits to be conducted during years 1, 3, and 5. The purpose of the long-term monitoring program will be to evaluate the establishment and maintenance of the plant community within the project areas to determine if vegetation has been re-established in the impact area and if the performance standards have been met. Photos will be taken at the pre-established photo-points to document the status of the plantings.

Monitoring will be conducted using the techniques and procedures described below to quantify the survival, relative health and growth of plant material. Monitoring will be conducted in late August or early September, with the annual monitoring report describing and quantifying the status of the project actions submitted following each monitoring visit.

Monitoring shall be conducted pursuant to the schedule provided on the following page:

Table 4: Monitoring Schedule

Monitoring Event	Timing
Post Construction Inspection	Late fall after planting – report due by Dec. 15th
Long Term Monitoring	Late summer, first year – report due by Oct. 15th
	Late summer, third year – report due by Oct. 15th
	Late summer, fifth year – report due by Oct. 15th

4.6.1 Vegetation

As the disturbed areas are relatively small, monitoring of the forested community and forested perimeter of the acclimation pond will occur by count to determine percent survival. Areas of herbaceous and emergent plantings will be reviewed visually for estimated surface coverage. In addition, inspection of the planted material within the project areas to determine health and vigor of the installation will occur during each monitoring visit. Analysis results for all planted vegetation communities will be compared against Performance Standards provided in Chapter 4.3. Monitoring reports will be provided pursuant to reporting requirements as identified in Chapter 4.8.

4.6.2 Photographic Documentation

Permanent photo-points will be established at the project site in order to obtain representative photographs of the project. One photo-point will be established for each riparian planting area during the post-construction inspection to document vegetation success. Photographs will be taken from the same locations yearly to document the project's appearance and progress. These photographs will be included within the monitoring reports.

4.7 Contingency Plan

A contingency plan may be implemented if necessary. Contingency plans can include additional plant installation, erosion control, and plant substitutions including type, size, and location.

If the monitoring results indicate that any of the performance standards are not being met, it may be necessary to implement a contingency plan. Careful attention to maintenance is essential in ensuring that problems do not arise. Should any portion of the planting areas not meet the performance standards, a contingency plan will be developed and implemented upon regulatory approval.

Contingency/maintenance activities will be developed to address unique site characteristics and may include, but are not limited to:

1. Replacing all plants lost to vandalism, drought, or disease, as necessary.
2. Replacing any plant species with a 20% or greater mortality rate after two growing seasons with the same species or similar species as approved.
3. Irrigating planting areas only as necessary during dry weather if plants appear to be too dry, with a minimal quantity of water.
4. Reseeding the herbaceous planting areas with an approved seed mixture as necessary if erosion/ sedimentation occur.
5. Removing all trash or undesirable debris from the project area as necessary.

4.8 Reporting

Monitoring reports will be prepared following each site visit conducted (Years 1, 3, and 5); these reports will summarize the results of each monitoring visit. The monitoring reports will document the changes that have occurred within the project planting areas and make recommendations for improvements and/or corrective measures for any problems noted during the monitoring visits.

5 REESTABLISHMENT PLANTING DESIGN

As noted in the project description, the Yakama tribe proposes to reestablish pre-construction conditions (i.e. Wetland B) within the project area once the biological objectives and metrics established within the Mid-Columbia Coho Restoration Program Master Plan have been accomplished. Current projections indicate that restoration metrics will be accomplished by 2028.

Reestablishment of pre-project conditions will begin with the removal of the acclimation pond followed by grading of the pond area to approximate pre-construction topography and subsequent planting to re-establish pre-construction wetland conditions (Sheets 6 and 7).

5.1 Vegetation Community Reestablishment Planting Zones

5.1.1 Wetland

In order to fully reestablish pre-project wetland conditions, a minimum of 8,020 square feet (0.18 acres) of depressional wetland dominated by tree and herb stratum vegetation will be reestablished within the boundaries of the pre-project wetland area. It is anticipated that post-project wetland re-establishment actions will like result in the establishment of a wetland that is the size of the acclimation pond (i.e. 15,000 square feet) After the removal of the acclimation pond and its associated components, the previous boundaries of Wetland B will be identified and marked in the field. The hydric soil that was used to create the berm for the acclimation pond will be re-graded and returned to the wetland area. Additional soil amendments may also be added to support plant survivability and wetland reestablishment.

Once the soil amendment and grading has been completed, the wetland area will be planted utilizing the same species that were identified within the wetland during the delineation process. Invasive plant species, such as reed canary grass, that were identified within the boundaries of the pre-project wetland will not be used. The entire area wetland area will be seeded with the emergent plant species mixture identified in Table 7 (Sheet 7):

Table 5: Wetland B Reestablishment – Emergent Species

Plant Species	Quantity
Small Fruited Bulrush (*Scirpus microcarpus*)	50%
Kentucky Bluegrass (*Poa pratensis*)	50%

Once the area has been seeded, forest and shrub species as identified in Table 8 below will also be planted in small clusters along the fringes of the wetland and more sparsely within the center of the wetland in order to reestablish pre-project conditions (Sheet 7).

Table 6: Wetland B Reestablishment – Forest/Shrub Species

Plant Species	Size	Spacing
Black Cottonwood (*Populus balsamifera ssp. trichocarpa*)	1 gallon	20' o.c.
Star-flowered false Solomon's Seal *(Maianthemum stellatum)*	1 gallon	10' o.c.
Pacific Willow (*Salix lucida var. lasiandra)*	Cutting/stake	10' o.c.

Care will be taken during the re-establishment of Wetland B to maintain as much of the existing mature vegetation as possible. However, some areas outside of the boundaries of the reclaimed acclimation pond area may be disturbed during re-establishment activities. These areas will be hydroseeded with the following seed mixture:

Table 7: Acclimation Pond Installation: Herbaceous Community

Plant Species	Quantity
Secar Bluebunch wheatgrass (*Pseudoroegneria spicata*)	30%
Mountain brome (*Bromus carinatus*)	30%
Blue Wildrye (*Elymus glaucus*)	30%
Idaho fescue (*Festuca idahoensis*)	10%
Yarrow (*Achillea millefolium*)	0.15 lbs/acre

5.2 Goals and Objectives

The goal of this phase of the project is to reestablish the pre-construction vegetation communities in the project area. This goal will be accomplished through the following objectives:

- Remove all project components and grade the disturbed area to reestablish pre-project topography.
- Plant disturbed areas, utilizing the species identified in Section 5.1, to reestablish pre-project wetland, forested, and herbaceous vegetative communities.

5.3 Performance standards

The following performance standards are based on the vegetation community reestablishment objectives stated in Section 5.2 of this document

1. Remove all project components and grade disturbed area to reestablish pre-project topography. This standard includes returning pre-project hydric soils used to create the berm around the acclimation pond to the wetland.
2. Reestablish a minimum of 8,020 square feet (0.18 acres) of wetland by seeding and planting the area with the species listed in Tables 5 and 6.
3. Provide temporary irrigation to all plant areas for at least one growing season or as deemed necessary.

5.4 Reestablishment Monitoring and Contingency Plan

Reestablishment monitoring and contingency planning will be addressed at the time reestablishment planting occurs, and will be submitted with any permitting and/or as built reports as required. Monitoring and contingency planning will be conducted pursuant to the industry standards in place at the time the planting occurs.

6 REFERENCES

Grette Associates, 2012a. Eightmile Site – Coho Acclimation Pond Project: Plant Survey Report, Okanogan County, WA

Grette Associates 2012b. Eightmile Site – Coho Acclimation Pond Project: Wetland Delineation Report, Okanogan County, WA

Sea Springs Co. February 2013. Eightmile Ranch Acclimation Site Project Description Draft.

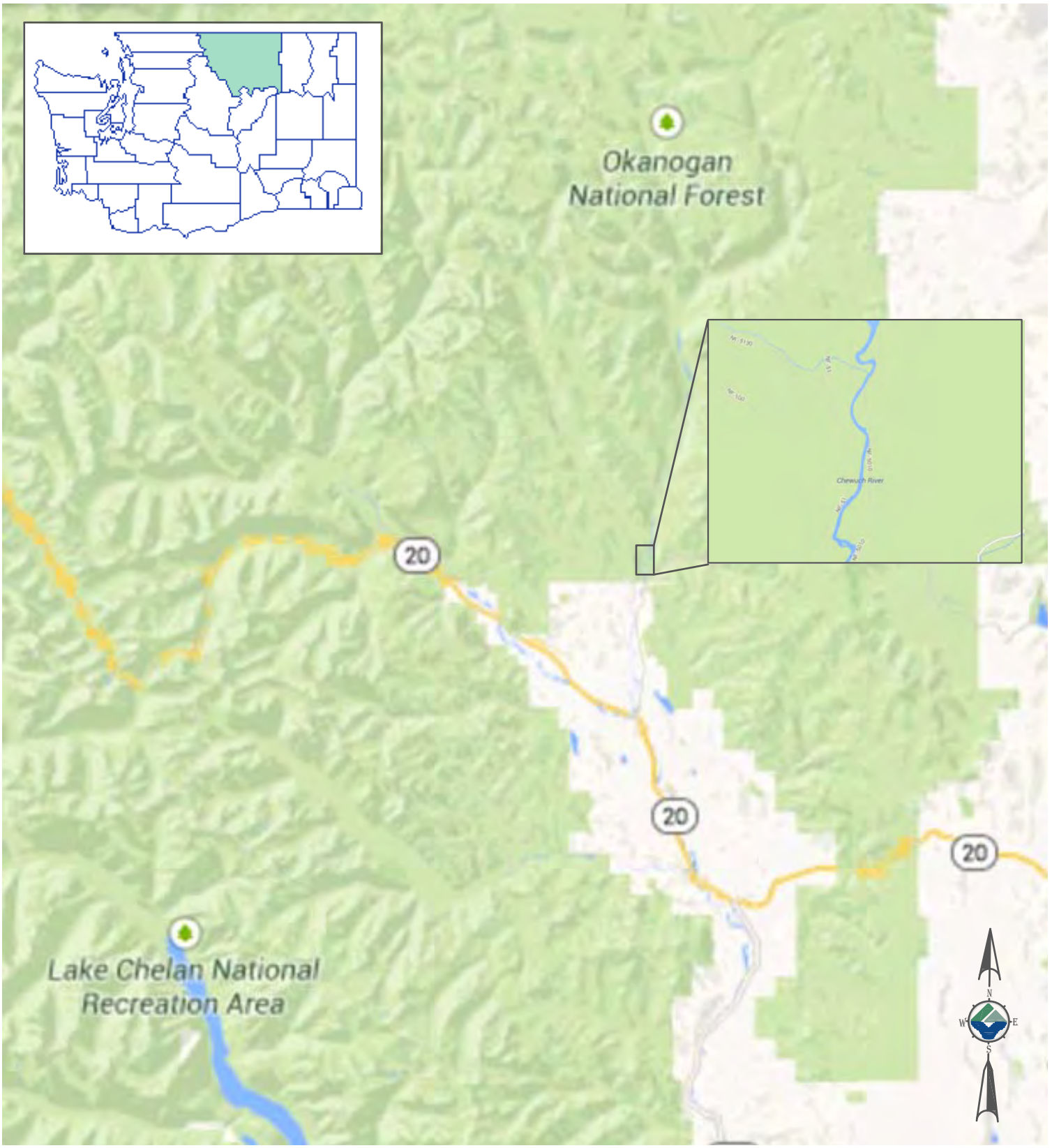
Wildlands, Inc. 2012. Native Plant Restoration Plan – Chewuch River, Eight Mile Ranch.

Yakama Tribe 2013. Yakama Nation UCHRP, Chewuch River – Eightmile Ranch, Fall 2012 Planting.

MID-COLUMBIA COHO RESTORATION PROJECT

APPENDIX A: PROJECT SHEETS

Contents



SHEET 1

Project Area Vicinity Map

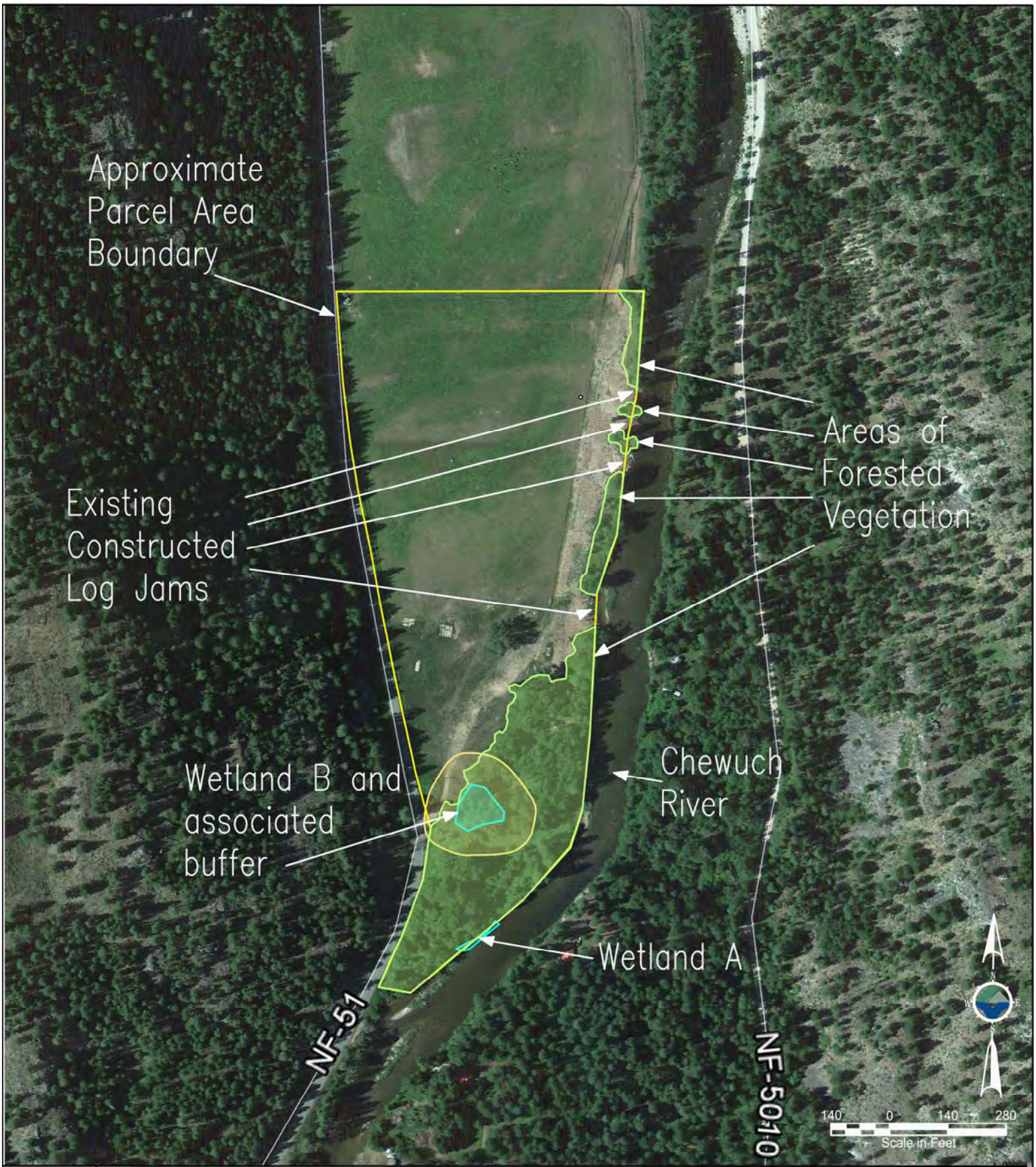
This site is located in the Okanogan National Forest in Okanogan County. To access the site, travel through the City of Winthrop on State Route 20. Once outside the City, take the first right onto Westside Chewuch (NF-51) and continue north 8.7 miles. The project site is located to the east (right).

Mid-Columbia Coho Restoration Project:

Acclimation Pond Installation and Post-Project Reestablishment Plan Eightmile Site - Okanogan County,WA

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS
2102 North 30th Street, Suite A
TACOMA, WA 98403
(253) 573-9300
gretteassociates.com

SITE LOCATION: Okanogan County, WA	DESIGNED BY: CM	DATE:02/25/14
	DRAWN BY: CM	DATE:03/05/14
CLIENT: Yakama Nation	CHECKED BY: RW	DATE:03/07/14
PROJECT #: 9662		



SHEET 2

Existing Vegetation Communities and Delineated Wetland Boundaries

Wetland Boundaries were delineated by Grette Associates. Refer to document entitled EightMile Site - Coho Acclimation Pond Project: Wetland Delineation Report (Grette Associates 2012).

All boundaries are approximate and based upon aerial image.

Mid-Columbia Coho Restoration Project:
Acclimation Pond Installation and Post-Project Reestablishment Plan
Eightmile Site - Okanogan County, WA

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

SITE LOCATION: Okanogan County, WA	
CLIENT: Yakama Nation	PROJECT #: 9662

DESIGNED BY: CM	DATE:02/25/14
DRAWN BY: CM	DATE:02/25/14
CHECKED BY: RW	DATE:02/27/14

SHEET 3

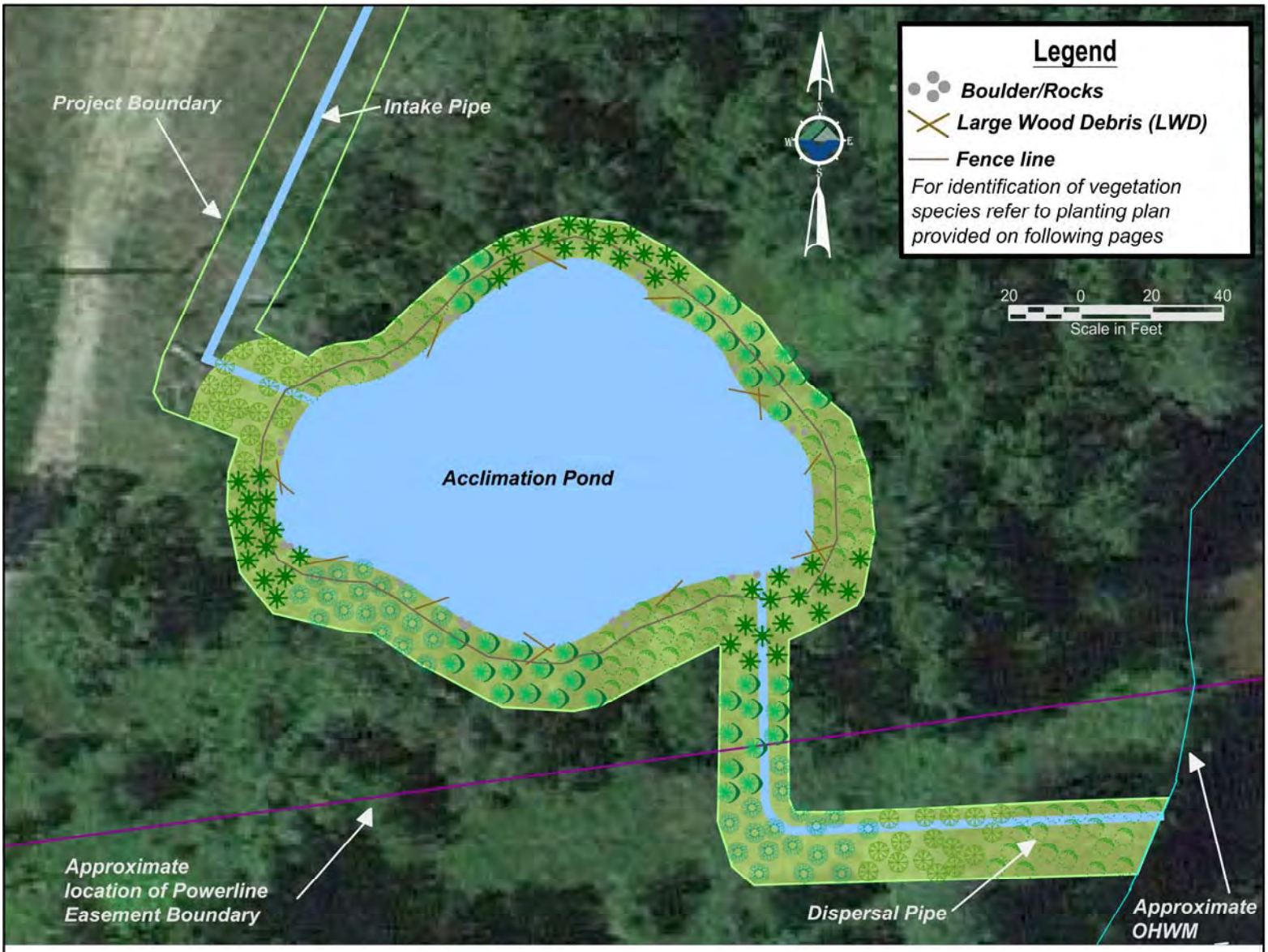
Construction/Project Boundaries

Mid-Columbia Coho Restoration Project:
Acclimation Pond Installation and
Post-Project Reestablishment Plan
Eightmile Site - Okanogan County, WA

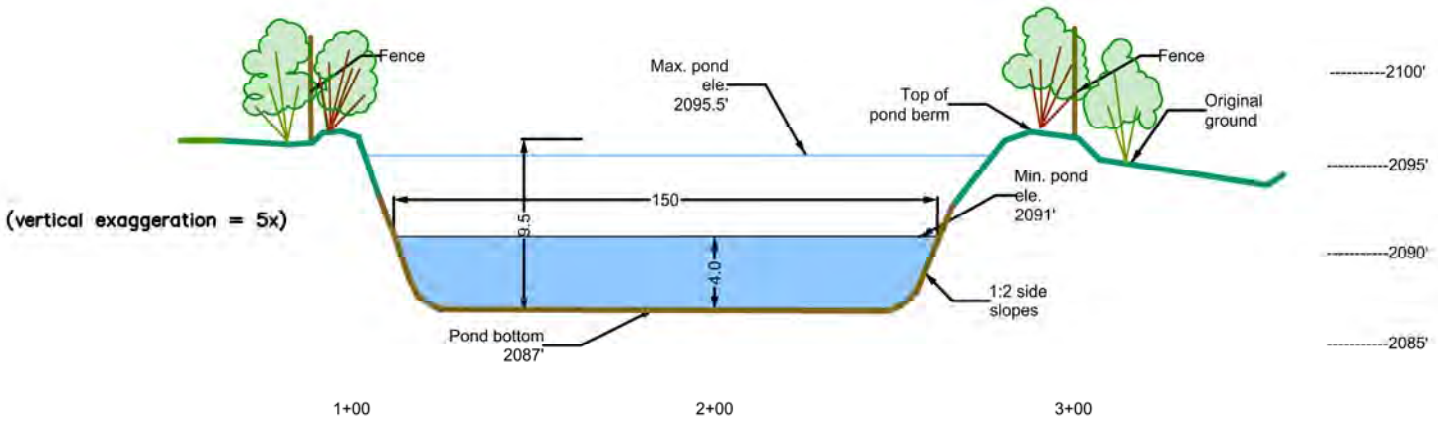
Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

SITE LOCATION: Okanogan County, WA	
CLIENT: Yakama Nation	PROJECT #: 9662

DESIGNED BY: CM	DATE:02/25/14
DRAWN BY: CM	DATE:02/25/14
CHECKED BY: RW	DATE:02/27/14



Acclimation Pond Cross Section Detail (Representative)



SHEET 4	Acclimation Pond and Forested Area Planting Plan	**Mid-Columbia Coho Restoration Project:** Acclimation Pond Installation and Post-Project Reestablishment Plan Eightmile Site - Okanogan County,WA	Grette Associates LLC Environmental Consultants
		SITE LOCATION: Okanogan County, WA	DESIGNED BY: CM DATE:02/25/14
		CLIENT: Yakama Nation PROJECT #: 9662	DRAWN BY: CM DATE:02/25/14
			CHECKED BY: RW DATE:02/27/14

Acclimation Pond and Dispersal Pipe Planting Plan (Forested Community)

Herbaceous Seed Mixture:

The entire area (shaded in green of Sheet 4) is to be seeded with the following herbaceous seed mixture prior to the planting of tree/shrub species:

COMMON NAME	*SCIENTIFIC NAME*	Quantity
"Durar" Hard Fescue	*Festuca trachyphylla*	50%
"Covar" Sheep Fescue	*Festuca ovina*	30%
Sandberg Bluegrass	*Poa secunda*	10%
Idaho Fescue	*Festuca idahoensis*	10%
Yarrow	*Achillea millefolium*	0.15 lbs/acre

Herbaceous Seed Mixture Planting Specifications:

1. Grass seed shall be applied at the rate of 20 lbs per acre.
2. Surface soils shall be decompacted prior to dispersion of seed to provide a proper seed bed.
3. If hydroseeding is utilized to dispense seed, additional seed erosion prevention measures such as straw and/or non-toxic tackifiers may be uses.
4. If necessary, seeded areas should be lightly raked to maximize seed/soil contact.
5. All seed shall be supplied in clearly labeled bags including the name and address of the supplier, lot number, net weight, percent of weed seed content, and guaranteed germination and purity percentages.
6. Industry standard planting and irrigation practices shall be used.

ADVISORY: Seed and seed labels shall conform to all applicable state and federal regulations and may be subject to the testing provisions of the Assoication of Official Seed Analysis.

Forest Planting Area Schedule :

SYMBOL	*SCIENTIFIC NAME*	COMMON NAME	' O/C
	Cornus stonlonifera	red osier dogwood	5' o.c.
	Alnus incana	Mountain Alder	5' o.c.
	Betula occidentalis	Water Birch	5' o.c.
	Salix prolixa	MacKenzie's willow	3' o.c.
	Salix lucida v. lasiandra	sitka willow	3' o.c.

Planting Specifications:

1. Mountain Alder, red osier dogwood, and water birch plants shall be 1 -gallon in size. Willows stakes may be used.
2. Plant species should be clustered in groups of 15 - 25.
3. Industry standard planting and irrigation practices shall be used.

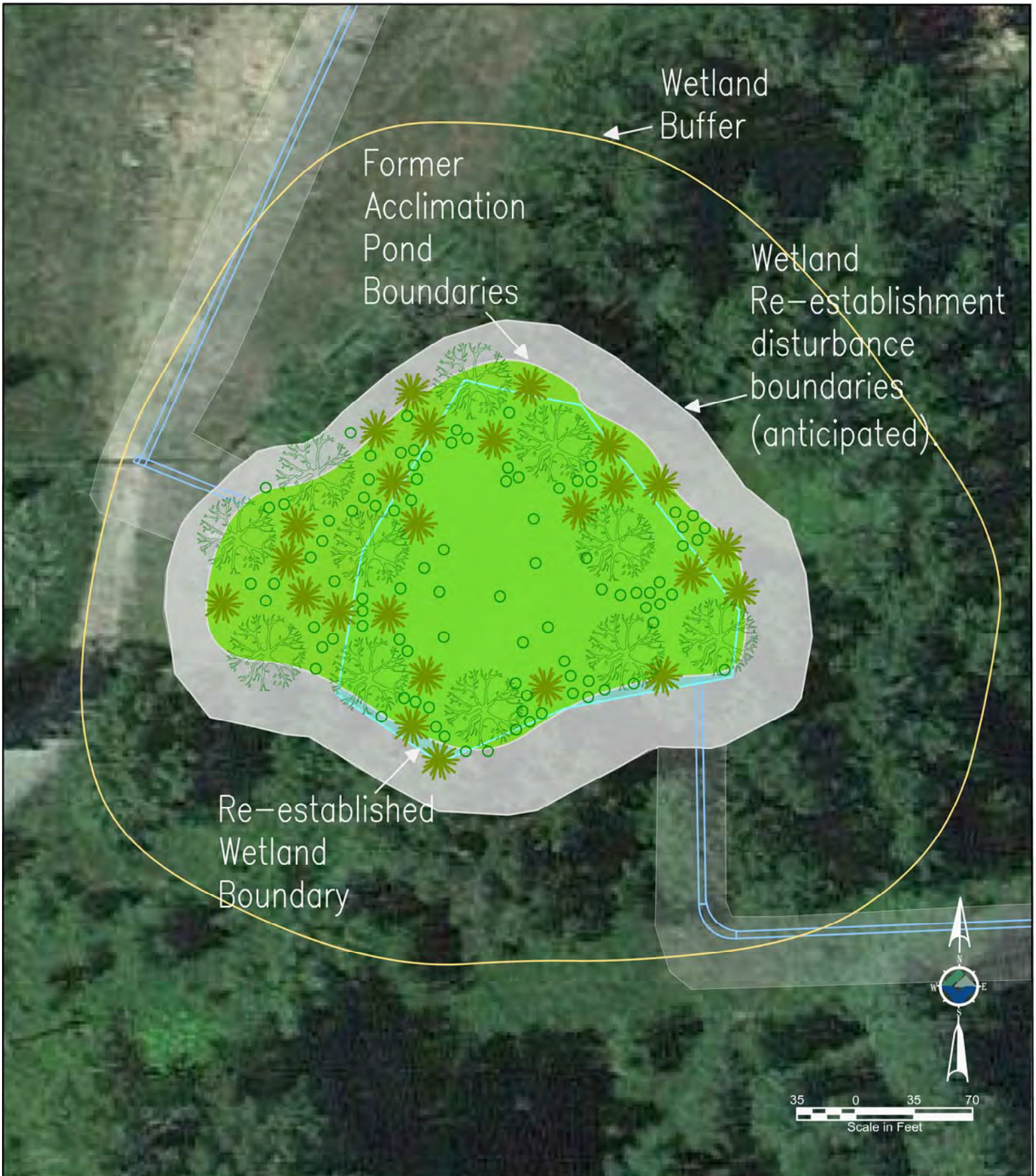
ADVISORY: Portions of the site occur within the boundaries of an overhead electrical easement. Plant species have been selected specifically for their mature plant height. If plant substitutions are necessary, plants with a similar growth structure are advised.

Emergent Community (Remainder of the site)

The remainder of the site (e.g. that area not planted under the forested community specifications) will be seeded with the following seed mixture, utilizing the planting specification identified for the herbaceous community as provided above.

COMMON NAME	*SCIENTIFIC NAME*	Quantity
Secar Bluebunch Wheatgrass	*Pseudoroegneria spicata*	30%
Mountain Brome	*Bromus carinatus*	30%
Blue wildrye	*Elymus glaucus*	30%
Idaho Fescue	*Festuca idahoensis*	10%
Yarrow	*Achillea millefolium*	0.15 lbs/acre

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS
2102 North 30th Street, Suite A
TACOMA, WA 98403
(253) 573-9300
grettleassociates.com



SHEET 6

Post Project Reestablishment of Wetland B - Planting Plan

Mid-Columbia Coho Restoration Project:
Acclimation Pond Installation and
Post-Project Reestablishment Plan
Eightmile Site - Okanogan County, WA

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

SITE LOCATION: Okanogan County, WA		DESIGNED BY: CM	DATE:02/25/14
CLIENT: Yakama Nation	PROJECT #: 9662	DRAWN BY: CM	DATE:02/25/14
		CHECKED BY: RW	DATE:02/27/14

Wetland B - Re-establishment

Herbaceous Seed Mixture:

The entire area within the previously existing boundaries of Wetland B is to be seeded with the following herbaceous seed mixture prior to the planting of tree/shrub species:

COMMON NAME	*SCIENTIFIC NAME*	Quantity
Small Fruited Bulrush	*Scirpus microcarpus*	**50%**
Kentucky Bluegrass	*Poa pratensis*	**50%**

Herbaceous Seed Mixture Planting Specifications:

1. Grass seed shall be applied at the rate of 20 lbs per acre.
2. Surface soils shall be decompacted prior to dispersion of seed to provide a proper seed bed.
3. If hydroseeding is utilized to dispense seed, additional seed erosion prevention measures such as straw and/or non-toxic tackifiers may be uses.
4. If necessary, seeded areas should be lightly raked to maximize seed/soil contact.
5. All seed shall be supplied in clearly labeled bags including the name and address of the supplier, lot number, net weight, percent of weed seed content, and guaranteed germination and purity percentages.
6. Industry standard planting and irrigation practices shall be used.

ADVISORY: Seed and seed labels shall conform to all applicable state and federal regulations and may be subject to the testing provisions of the Assoication of Official Seed Analysis.

Forest/Shrub Species :

SYMBOL	COMMON NAME	*SCIENTIFIC NAME*	Size	Spacing
	Black Cottonwood	*Populus balsamifera ssp. trichocarpa*	1 gallon	20' o.c.
	Star-flowered false Solomon's Seal	*Maianthemum stellatum*	1 gallon	10' o.c.
	Pacific Willow	*Salix lucida var. lasiandra*	cutting/stake	10' o.c.

Planting Specifications:

1. Industry standard planting and irrigation practices shall be used.

ADVISORY: Portions of the site occur within the boundaries of an overhead electrical easement. Plant species have been selected specifically for their mature plant height. If plant substitutions are necessary, plants with a similar growth structure are advised.

Other Disturbed Areas

Care will be taken during the re-establishment of Wetland B to maintain as much of the existing, mature vegetation as possible. However, some areas outside of the boundaries of the acclimation pond may be disturbed by re-establishment activities. These areas will be hydroseeded with the following seed mixture:

COMMON NAME	*SCIENTIFIC NAME*	Quantity
Secar Bluebunch Wheatgrass	*Pseudoroegneria spicata*	**30%**
Mountain Brome	*Bromus carinatus*	**30%**
Blue wildrye	*Elymus glaucus*	**30%**
Idaho Fescue	*Festuca idahoensis*	**10%**
Yarrow	*Achillea millefolium*	**0.15 lbs/acre**

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APPENDIX 2: ACCLIMATION POND—OPTION 2: INSTALLATION AND POST-PROJECT REESTABLISHMENT PLAN

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MID-COLUMBIA COHO RESTORATION PROJECT

ACCLIMATION POND – OPTION 2
INSTALLATION AND POST-PROJECT
REESTABLISHMENT PLAN
EIGHTMILE SITE – OKANOGAN COUNTY, WA

PREPARED FOR:

CORY KAMPHAUS
YAKAMA NATION – MID-COLUMBIA COHO RESTORATION PROGRAM
7051 HIGHWAY 97
PESHASTIN, WA 98847

PREPARED BY:

GRETTE ASSOCIATES[LLC]
151 S. WORTHEN STREET, SUITE 101
WENATCHEE, WA 98801
(509) 663-6300

MARCH 2014

Grette Associates[LLC]
ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

1 INTRODUCTION

The Yakama Tribe of Indians is working to establish a locally adapted and self-sustaining population of Coho Salmon (*Oncorhynchus kitsutch*) in the Mid-Columbia basin. These efforts are known as the Methow Natural Production Implementation Phase of the Mid-Columbia Coho Reintroduction Project (MCCRP) and are being conducted throughout the Methow and Wenatchee Basins. The MCCRP includes plans for Coho smolt acclimation and release at approximately 11 locations in the Methow watershed. This document addresses project activities that are proposed at Eightmile Ranch, a United States Forest Service owned property. The Eightmile ranch site is located along the Chewuch River in the Okanogan National Forest in Okanogan County in Section 26, Township 36, Range 21 East, W.M.; latitude 48.592, longitude -120.165 (Sheet 1).

The major project elements associated with the construction and use of the acclimation pond at the Eightmile Ranch site are as follows: grading and excavation of the project area, the installation of a surface water intake and supply pipeline, a ground water supply pipeline, a smolt acclimation pond, and a discharge line down to the river (Project Area, Sheet 3). Approximately 150,000 smolts would be acclimated within the proposed pond and released from the site, entering the Chewuch River at River Mile (RM) 10.3.

The Yakama Tribe has contracted with Grette Associates^{LLC} to provide an Acclimation Pond Installation Planting Plan and Post-Project Vegetation Community Plan (Plan) for the Eightmile Site Project Area. This plan provides both a project planting design to be installed after construction of the acclimation pond is completed as well as a reestablishment planting design to return the site to pre-construction conditions, i.e. those that currently existing on site, after MCCRP objectives have been met and the acclimation pond has been removed. To facilitate project success and promote the establishment of a cohesive site, both the acclimation pond and post-project reestablishment planting designs utilize plant species that currently exist within and adjacent to the project boundaries as determined during recent plant studies (Grette Associates 2012a) and wetland delineations (Grette Associates 2012b) as well as on-going riparian native plant restoration efforts (Yakima Nation 2012).

2 PROJECT AREA CHARACTERISTICS

The project area is located within an upland terrace area directly adjacent to the Chewuch River. Vegetation within the project area is comprised of two communities, a large herbaceous community and smaller area of forested community (Sheet 2). These communities are separated by an existing dirt road and fence, with the grassy herbaceous community to the northwest and the forested community to the southeast.

The herbaceous community includes multiple grass species such as Idaho fescue (*Festuca idahoensis*), Blue wildrye (Elymus glaucus), and Secar Bluebunch wheatgrass (*Pseudoroegneria spicata*). Black cottonwood (*Populus balsamifera ssp. trichocarpa*) and Ponderosa pine (*Pinus ponderosa*) are the dominant forest community species with additional tree/shrub species such as mountain alder (*Alnus incana*), Douglas hawthorn (*Crataegus douglasii*), Pacific willow (*Salix lucida var. lasiandra*), Bebb's willow (*S.*

bebbiana), and red osier dogwood (*Cornus sericea*) interspersed. The forested community also includes a well-established understory of subshrubs and forbs, which is dominated by snowberry (*Symphoricarpos albus*), showy aster (*Eurybia conspicua*), and various grasses and sedges. No rare plant species as listed by the Washington State Department of Natural Resources were identified in the project area (Grette Associates 2012a).

The project area, as well as land directly adjacent to the project area, has been reviewed for the presence of wetlands. The Eightmile Site-Coho Acclimation Pond Project: Wetland Delineation Report (Grette Associates 2012b) identifies two wetlands, A and B, within the project area boundaries. Wetland A is a riverine emergent temporarily flooded wetland, comprising 1,229 square feet, and is located within the southwestern portion of the study area directly adjacent to the Chewuch River. Wetland B is a depressional, Palustrine Forested, seasonally flooded wetland approximately 8,020 square feet in size. Wetland B is located approximately 230 feet north of Wetland A (Sheet 2).

3 PROJECT DESCRIPTION

The Yakama Tribe proposes to construct a new Coho Acclimation pond adjacent to the Chewuch River and within the boundaries of the Eightmile Ranch property. The pond will serve as a semi-natural rearing and acclimation area for juvenile Coho salmon and is part of a larger effort to reestablish Coho salmon within the Wenatchee and Methow basins. The proposed acclimation pond construction includes the installation of a screened surface water intake and supply pipeline, a groundwater supply pipeline, the smolt acclimation pond and a gated discharge pipe connecting the pond to the Chewuch River (Sheet 3). Total project area is approximately 68,800 square feet (1.58 acres).

Project construction will require grading and excavation within portions of the existing forested and herbaceous communities. The proposed acclimation pond will be constructed within the existing forested community area (Sheet 2). Soils excavated to place the intake and dispersal pipes and acclimation pond will be used to backfill the intake and dispersal pipe trenches. Any unused soil will be removed from the project area.

After construction of the pond and associated intake and dispersal pipes is completed, the project area will be planted to stabilize the site, minimize erosion, and support acclimation pond function. The area surrounding the acclimation pond will be planted with forested vegetation. Two- to three-man rocks and large woody debris (LWD) will be interspersed through the planting area around the pond to create a more natural visual appearance to the acclimation pond. The acclimation pond will also be fenced to prevent fish predation. However, the fencing shall be of an earthen brown tone that will be more camouflaged against the planted vegetation than. All other areas disturbed as a result of this project will be planted with corresponding pre-construction vegetation community species in order to resume site habitat the greatest extent possible.

Juvenile Coho smolts would be placed into the operational pond by the Tribe for acclimation. After the acclimation season is completed, the screen to the discharge pipe would be removed and the fish would be allowed to migrate into the river.

Once the biological objectives and metrics established within the Mid-Columbia Coho Restoration Program Master Plan have been accomplished, the tribe proposes to remove the pond and reestablish pre-construction conditions within the project area. As such, this document also addresses the re-establishment of currently existing site conditions once the acclimation pond is removed (Chapter 5). Current projections indicate that restoration metrics will be accomplished by 2028.

4 POST-CONSTRUCTION PLANTING DESIGN

Approximately 49,000 square feet (1.12 acres) of herbaceous community and 19,300 square feet (0.44 acres) of forested community will be temporarily disturbed by construction activities. This chapter address how specific elements of the project area will be planted post construction as well as associated project goals, monitoring strategies, contingency planning, and reporting requirements.

4.1 Planting Zones

4.1.1 Acclimation Pond/Forested Community

The Acclimation Pond/Forested Community has a total area of 19,300 square feet (0.44 acres) and is comprised of two distinct sub-zones. The sub-zones are summarized as follows:

- An open water smolt acclimation area (approximately 15,000 square feet). No planting will occur within this sub-zone;
- A forested perimeter (approximately 4,300 square feet) located around the pond and over the dispersal pipe.

Proposed plantings for the forested perimeter are described in Tables 1 and 2 provided as follows and depicted on Sheets 4 and 5:

Table 1: Herbaceous species

Plant Species	Quantity
"Durar" Hard Fescue (*Festuca trachyphylla*)	50%
"Covar" Sheep Fescue (*Festuca ovina*)	30%
Sandberg Bluegrass (*Poa secunda*)	10%
Idaho Fescue (*Festuca idahoensis*)	10%
Yarrow (*Achillea millefolium*)	0.15 lbs/acre

Table 2: Forested Species

Plant Species	Size	Spacing
Mountain Alder (*Alnus incana*)	1 gallon	5' o.c.
Water Birch (*Betula occidentalis*)	1 gallon	5' o.c.
Red Osier dogwood (*Cornus stolonifera*)	1 gallon	5' o.c.
MacKenzie's Willow (*Salix prolixa*)	Cutting/stakes	3' o.c.
Pacific Willow (*Salix lucida var. lasiandra)*	Cutting /stakes	3' o.c.

As noted in the project description, two- and three-man rocks and large woody debris will be interspersed throughout the forested planting area immediately adjacent to the acclimation pond to provide a more natural appearance to the pond area.

Fencing is required around the pond to prevent fish predation. However, the installed fencing shall be of an earthen brown tone in order to more effectively blend with the natural environment.

4.1.2 Herbaceous Community Reestablishment

After project installation, the remainder of the site not planted pursuant to the forested planting schedule 49,000 square feet will be re-established as herbaceous community. A minimum of four inches of surface soils on the horizontal plane will be decompacted to provide a proper seed bed. Soil amendments, if necessary, may also be added at this time as needed to support plant growth. An herbaceous seed mixture, as described in Table 4, will be dispersed over the area.

Table 3: Acclimation Pond Installation: Herbaceous Community

Plant Species	Quantity
Secar Bluebunch wheatgrass (*Pseudoroegneria spicata*)	30%
Mountain brome (*Bromus carinatus*)	30%
Blue Wildrye (*Elymus glaucus*)	30%
Idaho fescue (*Festuca idahoensis*)	10%
Yarrow (*Achillea millefolium*)	0.15 lbs/acre

This seed mixture will be applied at a rate of 20 pounds per acre. If necessary, seeded areas will be lightly raked to maximize seed-soil contact.

4.2 Goals and Objectives

The primary goals of this Planting Plan are to establish plantings around the acclimation pond to (1) improve the pond's functionality by establishing habitat supporting vegetation around the perimeter of the pond and (2) reestablish the pre-project vegetation communities within all other portions of the project area. These goals will be met through the following project objectives:

- Clear and grade the project area according to the grading plan
- Plant the perimeter of the proposed acclimation pond with forested vegetation.
- Plant the areas disturbed by the project with herbaceous and forested plant species as suitable for the pre-project vegetation community.
- Monitor the establishing vegetation communities within the project boundaries to ensure compliance with performance standards.

4.3 Performance standards

The following performance standards are based on the objectives stated in Section 4.2 of this document:

1. Clear, grade and prepare the project site 68,800 square feet (1.60 acres).
2. Install project components including surface water intake and pipe, acclimation pond and dispersal pipe.
3. Reestablish 19,300 square feet (0.44 acres) of forested community vegetation within the project area.
4. Reestablish 49,000 square feet (1.12 acres) of herbaceous community vegetation within the project area.
5. Provide temporary irrigation to all plant areas for at least one growing season or as deemed necessary.
6. A minimum of 80 percent survival of installed plant species will be present in the pond planting area at the end of years 2 through 5.
7. Volunteer native species will be included as acceptable plants within the planted areas and included for plant success.
8. Areal coverage by invasive species shall not exceed 10 percent at the end of Monitoring Years 2 through 5. In the event that field review results in the determination that 10 percent invasive areal coverage is exceeded, invasive species will be removed mechanically in order to meet this standard.

4.4 Assumptions

Success of the proposed plantings associated with the project is based on several assumptions:

- Temperature and precipitation will be within normal ranges.
- unforeseen natural events, such as floods, earthquakes, and tornadoes, will not impact the site,
- vandalism will not occur,
- animal damage will be minimal, and
- all plant materials will be readily available.

4.5 Post-Construction Inspection

The post-construction inspection will consist of evaluating the plantings immediately after installation to confirm the planting plan was followed and the plants were installed appropriately. Planting of the project areas shall be completed after construction occurs and by the end of October, before the winter dormancy period begins.

Photo points will also be established during the post-construction inspection and will be marked in the field. These points will be utilized for monitoring and documenting the development of restored vegetation over the course of the long-term monitoring period.

Following completion of the post-construction monitoring, a summary technical memorandum will be prepared demonstrating compliance with this riparian planting plan and verifying that all design features have been correctly implemented. Any changes to the planting plan will also be discussed in the compliance memorandum. This plan will be submitted to regulatory staff for review.

4.6 Long-term monitoring

Long-term monitoring will be conducted over a five year period with monitoring visits to be conducted during years 1, 3, and 5. The purpose of the long-term monitoring program will be to evaluate the establishment and maintenance of the plant community within the project areas to determine if vegetation has been re-established in the impact area and if the performance standards have been met. Photos will be taken at the pre-established photo-points to document the status of the plantings.

Monitoring will be conducted using the techniques and procedures described below to quantify the survival, relative health and growth of plant material. Monitoring will be conducted in late August or early September, with the annual monitoring report describing and quantifying the status of the project actions submitted following each monitoring visit.

Monitoring shall be conducted pursuant to the schedule provided within Table 6 below:

Table 4: Monitoring Schedule

Monitoring Event	Timing
Post Construction Inspection	Late fall after planting – report due by Dec. 15th
Long Term Monitoring	Late summer, first year – report due by Oct. 15th
	Late summer, third year – report due by Oct. 15th
	Late summer, fifth year – report due by Oct. 15th

4.6.1 Vegetation

As the disturbed areas are relatively small, monitoring of the forested community and forested perimeter of the acclimation pond will occur by count to determine percent survival. Areas of herbaceous and emergent plantings will be reviewed visually for estimated surface coverage. In addition, inspection of the planted material within the project areas to determine health and vigor of the installation will occur during each monitoring visit. Analysis results for all planted vegetation communities will be compared against Performance Standards provided in Chapter 4.3. Monitoring reports will be provided pursuant to reporting requirements as identified in Chapter 4.8.

4.6.2 Photographic Documentation

Permanent photo-points will be established at the project site in order to obtain representative photographs of the project. One photo-point will be established for each riparian planting area during the post-construction inspection to document vegetation success. Photographs will be taken from the same locations yearly to document the project's appearance and progress. These photographs will be included within the monitoring reports.

4.7 Contingency Plan

A contingency plan may be implemented if necessary. Contingency plans can include additional plant installation, erosion control, and plant substitutions including type, size, and location.

If the monitoring results indicate that any of the performance standards are not being met, it may be necessary to implement a contingency plan. Careful attention to maintenance is essential in ensuring that problems do not arise. Should any portion of the planting areas not meet the performance standards, a contingency plan will be developed and implemented upon regulatory approval.

Contingency/maintenance activities will be developed to address unique site characteristics and may include, but are not limited to:

1. Replacing all plants lost to vandalism, drought, or disease, as necessary.
2. Replacing any plant species with a 20% or greater mortality rate after two growing seasons with the same species or similar species as approved.
3. Irrigating planting areas only as necessary during dry weather if plants appear to be too dry, with a minimal quantity of water.
4. Reseeding the herbaceous planting areas with an approved seed mixture as necessary if erosion/ sedimentation occur.
5. Removing all trash or undesirable debris from the project area as necessary.

4.8 Reporting

Monitoring reports will be prepared following each site visit conducted (Years 1, 3, and 5); these reports will summarize the results of each monitoring visit. The monitoring reports will document the changes that have occurred within the project planting areas and make recommendations for improvements and/or corrective measures for any problems noted during the monitoring visits.

5 REESTABLISHMENT PLANTING DESIGN

As noted in the project description, the Yakama tribe proposes to reestablish pre-construction conditions within the project area once the biological objectives and metrics established within the Mid-Columbia Coho Restoration Program Master Plan have been accomplished. Current projections indicate that restoration metrics will be accomplished by 2028.

Reestablishment of pre-project conditions will begin with the removal of the acclimation pond and subsequent grading to approximate pre-construction topography. The disturbed project areas will then be planted to re-establish pre-construction forested communities.

5.1 Goals and Objectives

The goal of the post-acclimation pond use phase of the project is to reestablish the pre-construction vegetation communities in the project area. This goal will be accomplished through the following objectives:

- Remove all project components and grade the disturbed area to reestablish pre-project topography.
- Plant disturbed areas, utilizing the species identified in Section 5.1, to reestablish pre-project wetland, forested, and herbaceous vegetative communities.

5.2 Performance standards

The following performance standards are based on the vegetation community reestablishment objectives stated in Section 5.2 of this document

1. Remove the acclimation pond and grade disturbed area to reestablish pre-project topography.
2. Reestablish the acclimation pond area and surrounding area as necessary, a minimum of 15,000 square feet (0.34 acres), with forested community. Note: Where feasible forested vegetation that was established as part of the installation of the pond will be maintained (e.g. along the eastern boundary of the acclimation pond) to expedite reestablishment of the area.
3. Provide temporary irrigation to all plant areas for at least one growing season or as deemed necessary.

5.3 Reestablishment Monitoring and Contingency Plan

Reestablishment monitoring and contingency planning will be addressed at the time reestablishment planting occurs, and will be submitted with any permitting and/or as built reports as required. Monitoring and contingency planning will be conducted pursuant to the industry standards in place at the time the planting occurs.

6 REFERENCES

Grette Associates, 2012a. Eightmile Site – Coho Acclimation Pond Project: Plant Survey Report, Okanogan County, WA

Grette Associates 2012b. Eightmile Site – Coho Acclimation Pond Project: Wetland Delineation Report, Okanogan County, WA

Sea Springs Co. February 2013. Eightmile Ranch Acclimation Site Project Description Draft.

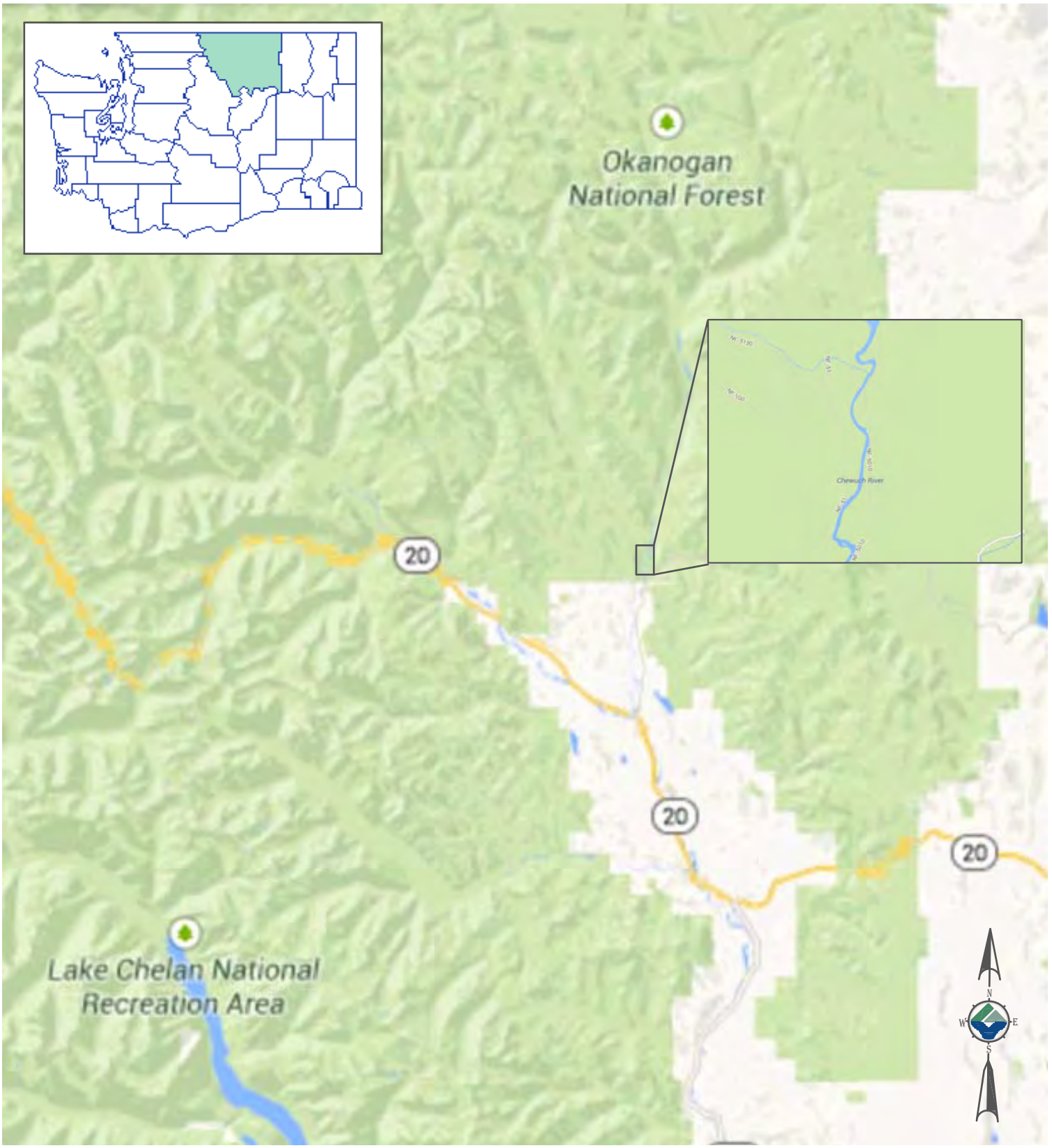
Wildlands, Inc. 2012. Native Plant Restoration Plan – Chewuch River, Eight Mile Ranch.

Yakama Tribe 2013. Yakama Nation UCHRP, Chewuch River – Eightmile Ranch, Fall 2012 Planting.

MID-COLUMBIA COHO RESTORATION PROJECT

APPENDIX A: PROJECT SHEETS

Contents



SHEET 1

Project Area Vicinity Map

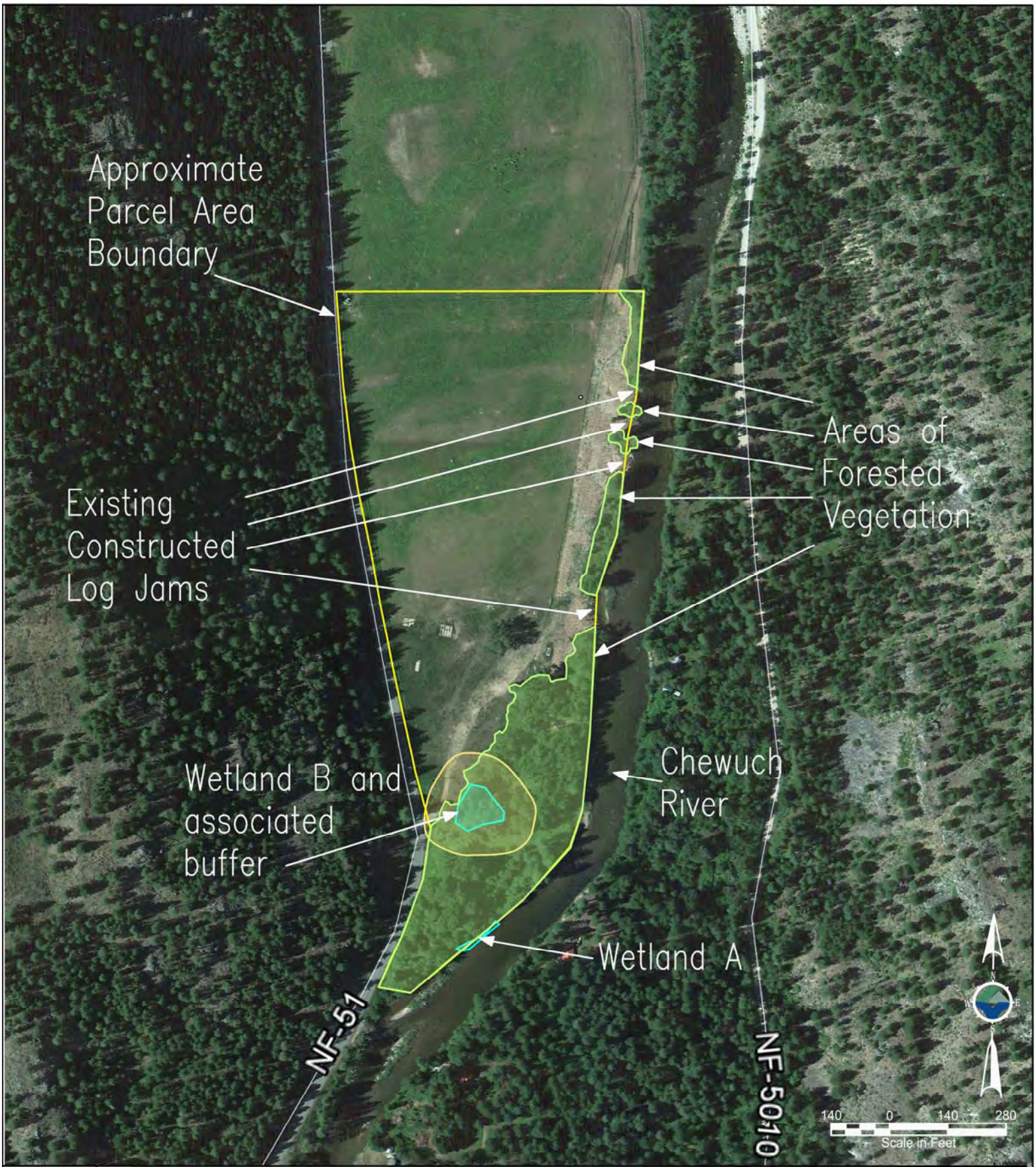
This site is located in the Okanogan National Forest in Okanogan County. To access the site, travel through the City of Winthrop on State Route 20. Once outside the City, take the first right onto Westside Chewuch (NF-51) and continue north 8.7 miles. The project site is located to the east (right).

Mid-Columbia Coho Restoration Project:

Acclimation Pond Installation and Post-Project Reestablishment Plan Eightmile Site - Okanogan County,WA

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS
2102 North 30th Street, Suite A
TACOMA, WA 98403
(253) 573-9300
gretteassociates.com

SITE LOCATION: Okanogan County, WA	DESIGNED BY: CM	DATE:02/25/14
	DRAWN BY: CM	DATE:03/05/14
CLIENT: Yakama Nation	CHECKED BY: RW	DATE:03/07/14
PROJECT #: 9662		



SHEET 2

Existing Vegetation Communities and Delineated Wetland Boundaries

Wetland Boundaries were delineated by Grette Associates. Refer to document entitled EightMile Site - Coho Acclimation Pond Project: Wetland Delineation Report (Grette Associates 2012).

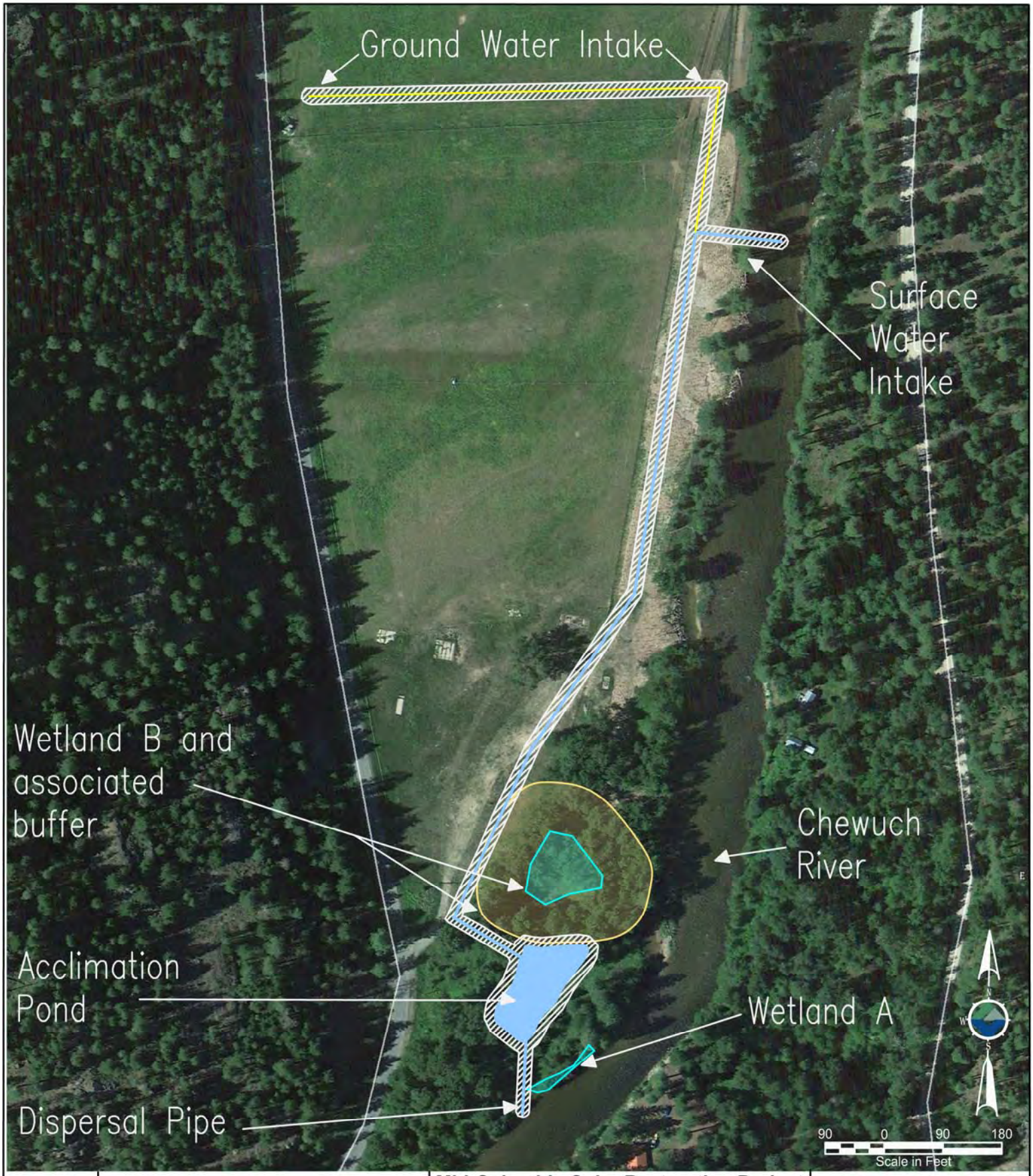
All boundaries are approximate and based upon aerial image.

Mid-Columbia Coho Restoration Project:
Acclimation Pond Installation and Post-Project Reestablishment Plan
Eightmile Site - Okanogan County, WA

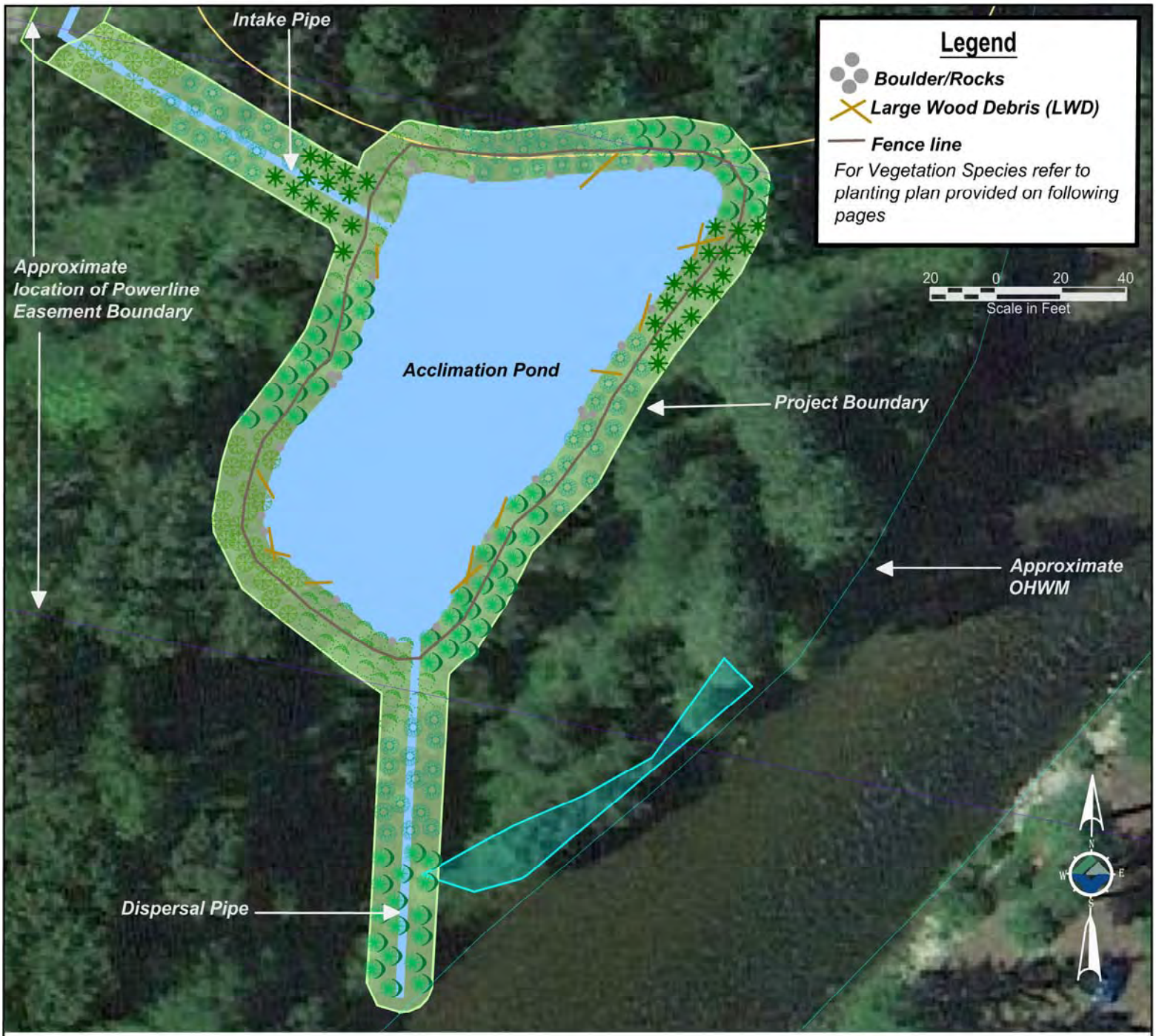
Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

SITE LOCATION: Okanogan County, WA	
CLIENT: Yakama Nation	PROJECT #: 9662

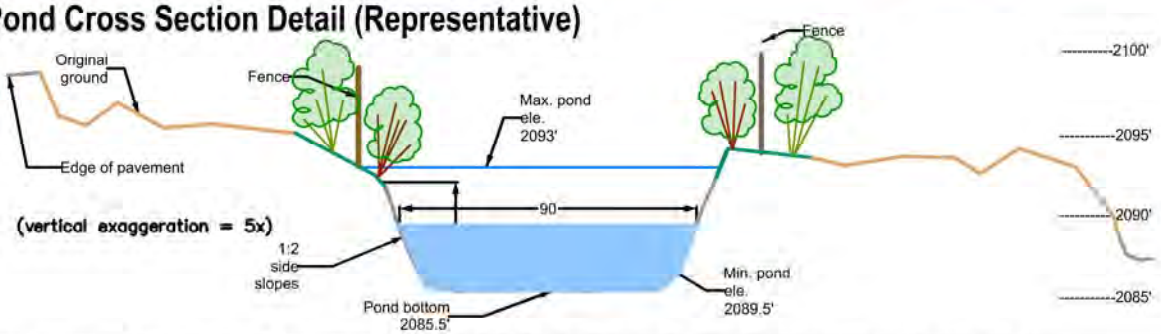
DESIGNED BY: CM	DATE:02/25/14
DRAWN BY: CM	DATE:02/25/14
CHECKED BY: RW	DATE:02/27/14



SHEET 3	**Construction/Project Boundaries**	**Mid-Columbia Coho Restoration Project:** Acclimation Pond Installation and Post-Project Reestablishment Plan Eightmile Site - Okanogan County, WA	Grette Associates ENVIRONMENTAL CONSULTANTS	
		SITE LOCATION: Okanogan County, WA	DESIGNED BY: CM	DATE:02/25/14
		CLIENT: Yakama Nation — PROJECT #: 9662	DRAWN BY: CM	DATE:02/25/14
			CHECKED BY: RW	DATE:02/27/14



Acclimation Pond Cross Section Detail (Representative)



SHEET 4	**Acclimation Pond and Forested Area Planting Plan**	**Mid-Columbia Coho Restoration Project:** Acclimation Pond Installation and Post-Project Reestablishment Plan Eightmile Site - Okanogan County,WA	Grette Associates LLC ENVIRONMENTAL CONSULTANTS
		SITE LOCATION: Okanogan County, WA	DESIGNED BY: CM DATE:02/25/14
		CLIENT: Yakama Nation PROJECT #: 9662	DRAWN BY: CM DATE:02/25/14
			CHECKED BY: RW DATE:02/27/14

Acclimation Pond and Dispersal Pipe Planting Plan (Forested Community)

Herbaceous Seed Mixture:

The entire area (shaded in green of Sheet 4) is to be seeded with the following herbaceous seed mixture prior to the planting of tree/shrub species:

COMMON NAME	*SCIENTIFIC NAME*	Quantity
"Durar" Hard Fescue	*Festuca trachyphylla*	50%
"Covar" Sheep Fescue	*Festuca ovina*	30%
Sandberg Bluegrass	*Poa secunda*	10%
Idaho Fescue	*Festuca idahoensis*	10%
Yarrow	*Achillea millefolium*	0.15 lbs/acre

Herbaceous Seed Mixture Planting Specifications:

1. Grass seed shall be applied at the rate of 20 lbs per acre.
2. Surface soils shall be decompacted prior to dispersion of seed to provide a proper seed bed.
3. If hydroseeding is utilized to dispense seed, additional seed erosion prevention measures such as straw and/or non-toxic tackifiers may be uses.
4. If necessary, seeded areas should be lightly raked to maximize seed/soil contact.
5. All seed shall be supplied in clearly labeled bags including the name and address of the supplier, lot number, net weight, percent of weed seed content, and guaranteed germination and purity percentages.
6. Industry standard planting and irrigation practices shall be used.

ADVISORY: Seed and seed labels shall conform to all applicable state and federal regulations and may be subject to the testing provisions of the Assoication of Official Seed Analysis.

Forest Planting Area Schedule :

SYMBOL	*SCIENTIFIC NAME*	COMMON NAME	' O/C
	Cornus stonlonifera	red osier dogwood	5' o.c.
	Alnus incana	Mountain Alder	5' o.c.
	Betula occidentalis	Water Birch	5' o.c.
	Salix prolixa	MacKenzie's willow	3' o.c.
	Salix lucida v. lasiandra	sitka willow	3' o.c.

Planting Specifications:

1. Mountain Alder, red osier dogwood, and water birch plants shall be 1 -gallon in size. Willows stakes may be used.
2. Plant species should be clustered in groups of 15 - 25.
3. Industry standard planting and irrigation practices shall be used.

ADVISORY: Portions of the site occur within the boundaries of an overhead electrical easement. Plant species have been selected specifically for their mature plant height. If plant substitutions are necessary, plants with a similar growth structure are advised.

Emergent Community (Remainder of the site)

The remainder of the site (e.g. that area not planted under the forested community specifications) will be seeded with the following seed mixture, utilizing the planting specification identified for the herbaceous community as provided above.

COMMON NAME	*SCIENTIFIC NAME*	Quantity
Secar Bluebunch Wheatgrass	*Pseudoroegneria spicata*	30%
Mountain Brome	*Bromus carinatus*	30%
Blue wildrye	*Elymus glaucus*	30%
Idaho Fescue	*Festuca idahoensis*	10%
Yarrow	*Achillea millefolium*	0.15 lbs/acre

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS
2102 North 30th Street, Suite A
TACOMA, WA 98403
(253) 573-9300
grettleassociates.com

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APPENDIX 3: WETLAND DELINEATION REPORT

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EIGHTMILE SITE
COHO ACCLIMATION POND PROJECT

WETLAND DELINEATION REPORT
OKANOGAN COUNTY, WA

PREPARED FOR:

YAKIMA NATION

PREPARED BY:

GRETTE ASSOCIATES[LLC]
151 SOUTH WORTHEN, SUITE 101
WENATCHEE, WASHINGTON 98801
(509) 663-6300

Grette Associates[LLC]
ENVIRONMENTAL CONSULTANTS

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1 INTRODUCTION

The Yakima Tribe of Indians has contracted with Grette Associates[LLC] to perform a wetland study and delineation within an area known as the Eightmile Site along the Chewuch River in the Okanogan National Forest in Okanogan County. The wetland delineation was performed in support of constructing an acclimation pond for juvenile coho salmon (*Oncorhynchus kitsutch*) on the site. This work was completed in Section 26, Township 36, Range 21 East, W.M.

Grette Associates staff biologists visited the site and performed wetland data collection and boundary delineation on August 15, 2012. Data sheets are attached for reference in Appendix A.

2 WETLAND SUMMARY

During the site investigations, the study area (Figure 1) was visually inspected for the presence of jurisdictional wetlands. Two wetlands were identified: Wetland A, and Wetland B. Wetland A is a riverine wetland, comprising approximately 1,229 square feet, and is located within the southwestern portion of the study area directly adjacent to the Chewuch River (Figure 1). Wetland A is generally dominated by herbaceous species. Wetland A is classified as a Riverine Emergent, temporarily-flooded wetland.

Wetland B is a depressional wetland, comprising approximately 8,068 square feet, and is located approximately 230 feet north of Wetland A (Figure 1). Wetland B is generally dominated by tree and herb stratum vegetation. Wetland B is classified as a Palustrine Forested, seasonally-flooded wetland.

Figure 1. Wetlands within the Study Area

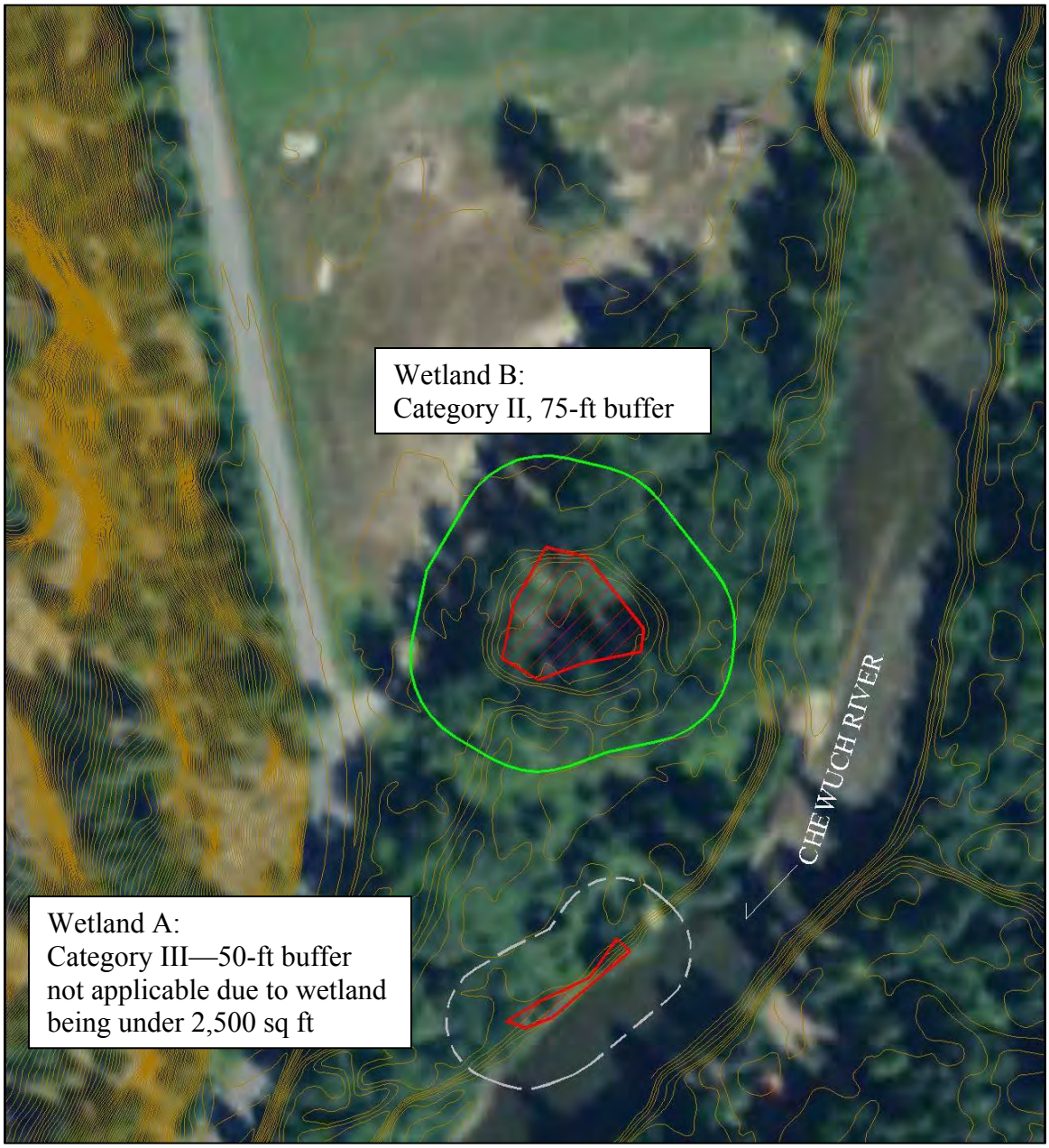


Figure 2. Wetland survey overlaid on hillshade survey data.

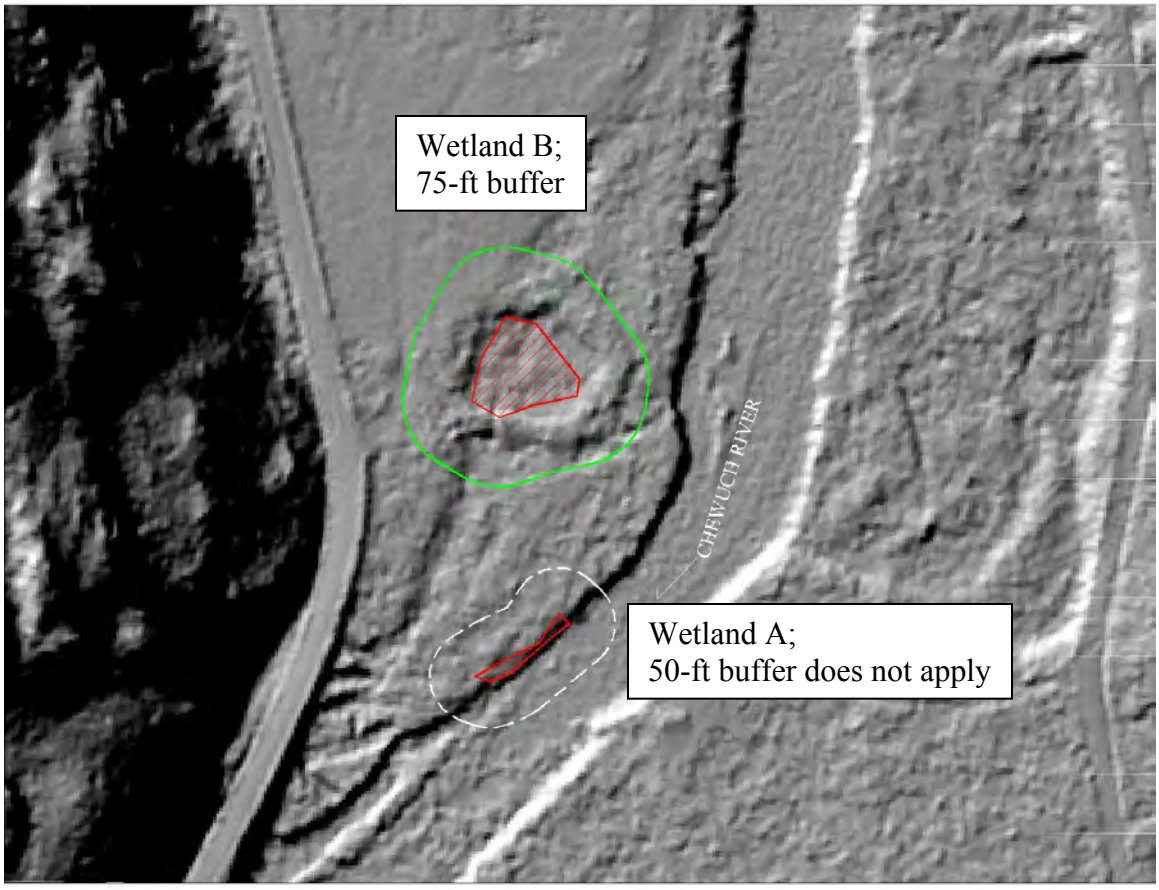


Table 1. Eightmile Study Area Wetland Summary.

Wetland	Area (square feet)	Cowardin Classification	Preliminary Rating	Regulated by Okanogan County?
A	1,229	Riverine Emergent Seasonally Flooded (RES)	III	No
B	8,068	Palustrine, Forested Seasonally Flooded (PFOS)	II	Yes

3 METHODS

The study area was traversed on foot and seven data plots and soil test pits were excavated to evaluate wetland conditions.

Wetland boundaries were established based on changes in vegetation, water levels at or above 12 inches below the soil surface, topographic changes, and best professional judgment. Data plots were established in and adjacent to each wetland area. The location of the wetland boundaries and data points were recorded using a Trimble dGPS unit and is presented in Figure 1.

3.1 WETLAND DELINEATION

To mark the boundary between wetlands and uplands, orange surveyor's flagging was numerically marked and tied to vegetation to identify the wetland boundary. To mark the points where data were collected, orange surveyor's flagging was numerically labeled and tied to vegetation at that location.

Guidance from the 1987 Army Corps of Engineers *Wetlands Delineation Manual ("1987 Manual")* (U.S. Army Corps of Engineers (USACE), 1987), as well as the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) ("Western Mountain Supplement")* (U.S. Army Corps of Engineers, 2010) was used to perform the wetland delineation. The methods in these manuals recognize that the three parameters of hydrology, hydric soils, and hydrophytic vegetation are generally found in wetlands and that these parameters are important in the establishment and maintenance of wetland communities. The methods evaluate each of the three parameters to determine if a wetland is present and to establish wetland boundaries.

The presence of dominant hydrophytic vegetation as well as indicators of wetland hydrology are used to delineate the boundary between wetland and upland areas. Wetland boundaries are then confirmed by checking the soil color and organic content to verify presence of hydric soils. Wetlands are classified using the U.S. Fish and Wildlife Service's (USFWS) *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, Carter, Golet, & LaRoe, 1979) and are categorized using Ecology's *Washington State Wetlands Rating System for Eastern Washington - Revised* (Hruby, 2006).

3.1.1 Hydrophytic Vegetation

USFWS has established a rating system that has been applied to commonly occurring plant species on the basis of their frequency of occurrence in wetlands (Table 1). Species indicator status expresses the range in which plants may occur in wetlands and non-wetlands (uplands). Under this system, vegetation is considered hydrophytic when there is an indicator status of facultative (FAC), facultative wetland (FACW) or obligate wetland (OBL) (Table 1). The USACE's *Western Mountains, Valleys, and Coast 2012 Final Regional Wetland Plant List* (Lichvar, 2012) was used to determine vegetation indicator status.

Under the Western Mountains Supplement, the hydrophytic vegetation criterion for a wetland determination is determined primarily by three tests, in order of priority: the rapid test, the dominance test, and the prevalence index. The dominance test is met when more than 50 percent of the dominant species in the plant community are FAC or wetter. The prevalence index begins with assessing and summing the total cover of all plants within the wetland. Next, the total cover within each indicator status (e.g. total cover of all OBL species, all FACW species, etc.) is summed, then multiplied by a multiplier (1 for OBL, 2 for FACW, 3 for FAC, 4 for FACU, and 5 for UPL species). Then the products of all indicator status categories are summed, and this sum is then divided by the

summed total coverage. If the result is above 3, the vegetative community is upland. If the result is below 3, the vegetative community is hydrophytic. Additionally, the observation of morphological plant adaptations and the presence of wetland non-vascular plants can be used as hydrophytic vegetation indicators.

Table 2. Definitions for USFWS plant indicator status

Plant Indicator Status Category	Indicator Status Abbreviation	Definition (Estimated Probability of Occurrence)
Obligate Upland	UPL	Occur rarely (<1 percent) in wetlands, and almost always (>99 percent) in uplands
Facultative Upland	FACU	Occur sometimes (1 percent to <33 percent) in wetlands, but occur more often (>67 percent to 99 percent) in uplands
Facultative	FAC	Similar likelihood (33 percent to 67 percent) of occurring in both wetlands and uplands
Facultative Wetland	FACW	Occur usually in wetlands (>67 percent to 99 percent), but also occur in uplands (1 percent to 33 percent)
Obligate Wetland	OBL	Occur almost always (>99 percent) in wetlands, but rarely occur in uplands (<1 percent)
Not Listed	NL	Not listed due to insufficient information to determine status

Plants were determined to be more or less associated with wetlands based on their wetland indicator status. The percent dominance for each plant strata was determined using the "50-20 Rule".

3.1.2 Wetland Hydrology

Evidence of permanent or periodic inundation or soil saturation to the surface for 12.5% of the growing season (soil temperatures above 41°F at 19.7 inches below the surface) meets the hydrology criterion. The Western Mountains Supplement includes several indicators of wetland hydrology, divided into four categories: Category A (observation of surface water or saturated soils), Category B (evidence of recent inundation), Category C (evidence of current or recent soil saturation), and Category D (evidence form other site conditions or data). Category A includes direct observations of hydrology, and Categories B-D include indirect observations. Within each category, indicators are further divided into "primary" and "secondary" indicators. One primary indicator is required to confirm the presence of wetland hydrology, while at least two secondary indicators are required. According to the Western Mountains Supplement, all indicators are "intended as one-time observations that are sufficient evidence of wetland hydrology in areas where hydric soils and hydrophytic vegetation are present" (U.S. Army Corps of Engineers, 2010, p. 69).

In the Northwest Forests and Coast Region (LRR A), nineteen primary indicators have been established, including surface water, high water table, soil saturation, surface soil cracks, inundation visible on aerial imagery, water-stained leaves, salt crust, hydrogen sulfide odor, and oxidized rhizospheres along live roots in the top 12 inches. Eight secondary indicators have been established, including drainage patterns, dry-season water table, saturation visible on aerial imagery, and a positive FAC-neutral test.

3.1.3 Hydric Soils

Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper soil horizons are considered hydric soils. Hydric soil indicators are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated or anaerobic environment. The Western Mountains Supplement includes six hydric soils indicators that apply to all soil types, including histosols, histic epipedon layer, black histic layer, a sulfidic odor, depleted soil matrix below dark surface, and thick dark surface. Additional indicators also apply based on the soil type (U.S. Army Corps of Engineers, 2010).

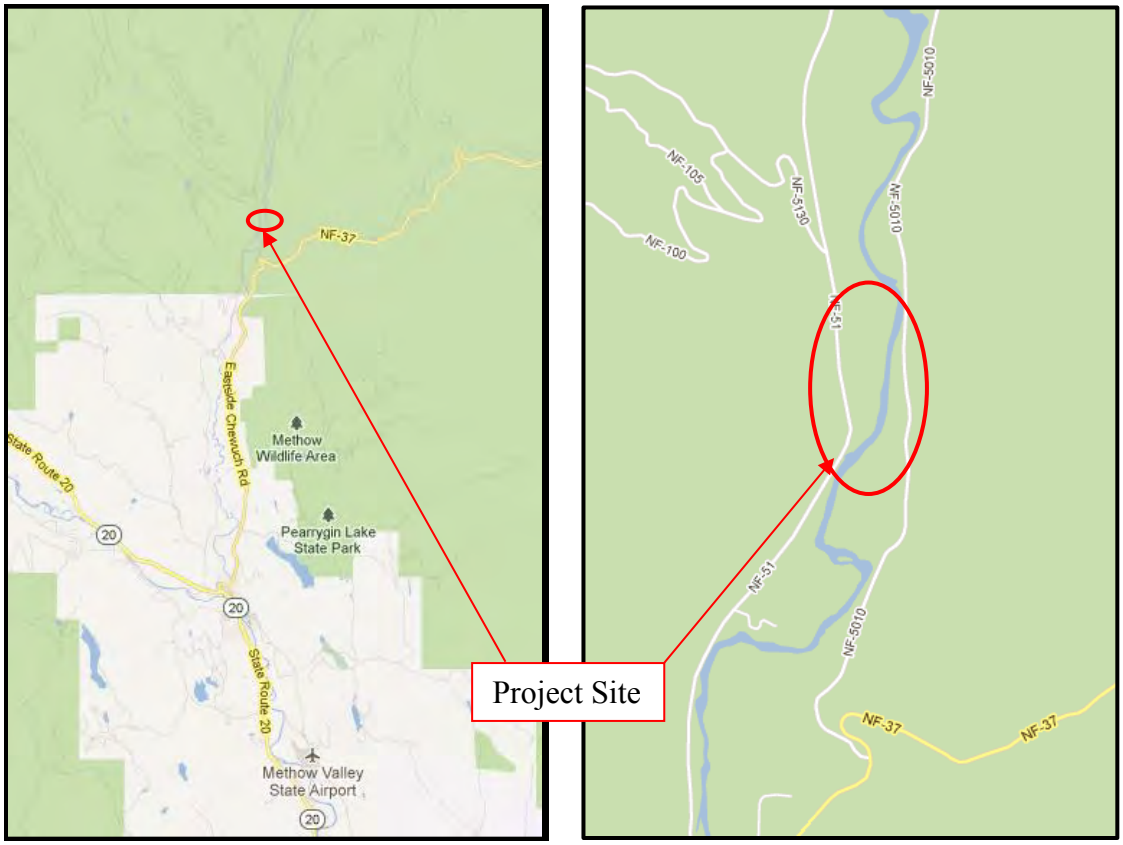
3.2 VEGETATION SURVEY

A vegetation survey was conducted over the portion of the study area that is proposed to be affected. Two Grette Associates biologists walked the property in transects, spaced approximately 50 ft apart. The transect spacing allowed for complete visual coverage of the study area. All plant species observed in the study area were identified to species. The plant survey is attached as Appendix B.

4 BACKGROUND INFORMATION

The Eightmile study area is located along the Chewuch River within the Okanogan National Forest in Okanogan County. To access the site, continue on State Route 20 into the City of Winthrop, turn left to remain on State Route 20. Take the first right onto Westside Chewuch and continue 8.7 miles to the site, on the right.

Figure 3. Vicinity maps



4.1 STUDY AREA CHARACTERISTICS

The study area is located adjacent to the Chewuch River in the Okanogan National Forest in Okanogan County. The focus of the wetland study was a small, forested area adjacent to a large field. The study area is generally flat with small-scale topographic variations (Figure 2), transitioning to a short, steeply-sloped river bank. The larger site was formerly a ranch and is currently public recreation and river access site.

The larger site is comprised of two vegetation communities—an herbaceous community and small area of forested community. These communities are essentially segregated by a dirt road, with the grassy herbaceous community to the northwest and the forested community to the southeast. The northern portion of the parcel consists of a relatively flat, large field in which grasses and herbaceous species dominate. This area is fenced in with a gated road leading into the field and down to the river. South of the road, the vegetation transitions to a riparian/forested community with black cottonwood (*Populus balsamifera ssp. trichocarpa*) and Ponderosa pine (*Pinus ponderosa*) dominating. Additional tree/shrub species common to this area include mountain alder (*Alnus incana*), Douglas hawthorn (*Crataegus douglasii*), Pacific willow (*Salix lucida var. lasiandra*), Bebb's willow (*S. bebbiana*), and red osier dogwood (*Cornus sericea*). Additionally, an understory of subshrubs and forbs is prevalent in this area, which is dominated by snowberry (*Symphoricarpos albus*), showy aster (*Eurybia conspicua*), and various grasses and sedges. Plant species found in the wetlands are listed in Table 3 below.

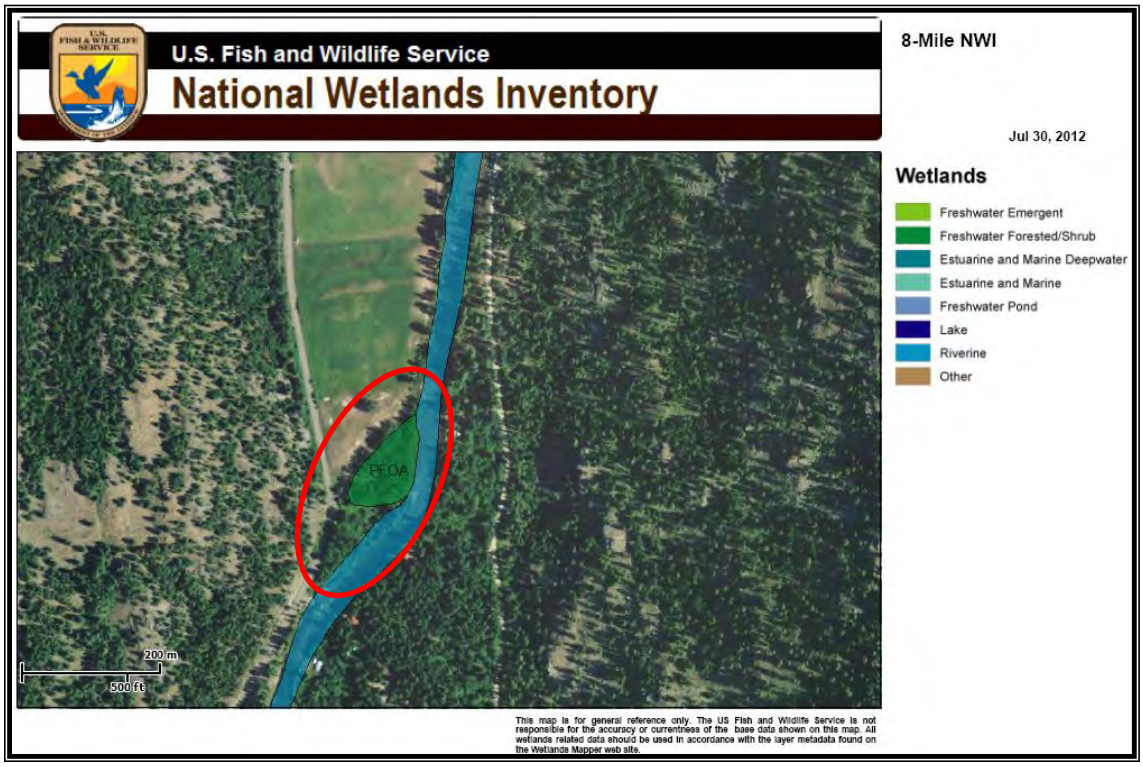
Table 3. Plant species identified within the test plots.

Species Name	Common Name	Indicator Status	Wetland A	Wetland B
Juncus ensifolius	Dagger Leaf Rush	FACW	X	
Carex exsiccata	Inflated Sedge	OBL	X	
Scirpus microcarpus	Small Fruited Bulrush	OBL	X	X
Phalaris arundinacea	Reed Canary Grass	FACW	X	X
Equisetum arvense	Field Horsetail	FAC	X	
Salix lucida var. lasiandra	Pacific Willow	FACW		X
Populus balsamifera ssp. trichocarpa	Black Cottonwood	FAC		X
Pinus ponderosa	Ponderosa Pine	FACU		X
Maianthemum stellatum	Star-flowered false Solomon's Seal	FAC		X
Poa pratensis	Kentucky Bluegrass	FAC		X

4.2 NATIONAL WETLANDS INVENTORY

The U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI) was queried to determine if previously identified wetlands are present on or near the study area (USFWS 2012). According to the NWI Interactive Online Mapper, one wetland, a Palustrine Forested Temporarily Flooded (PFOA) wetland, is identified in the study area (Figure 4). The wetland area identified by the NWI does not correspond to the wetland areas found in the field.

Table 4. National Wetland Inventory (NWI) map.



4.3 SENSITIVE WILDLIFE AND PLANTS

The Washington Department of Fish and Wildlife's (WDFW) Priority Habitats and Species (PHS) database was queried to determine if state or federally listed fish or wildlife species occur on or near the study area. According to the PHS database, no sensitive fish or wildlife species occur within the study area. However, bull trout, chinook, steelhead trout and cutthroat have all documented current or historic use of the Chewuch River which is adjacent to the study area.

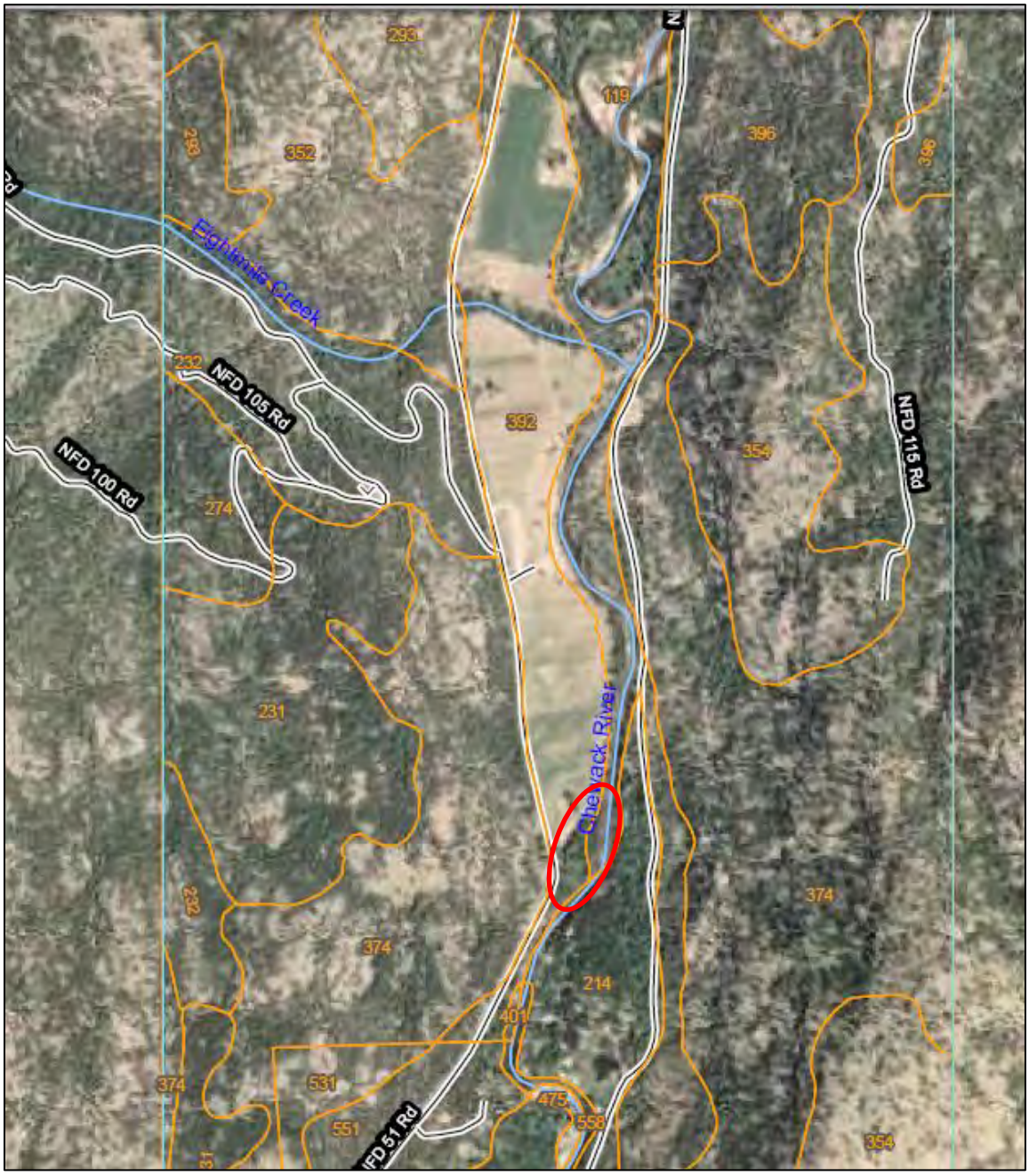
The Washington Department of Natural Resources' (WDNR) Natural Heritage Information System was queried to determine if the study area occurs in a location reported to contain high quality natural heritage wetland occurrences or occurrences of natural heritage features commonly associated with wetlands. According to WDNR data, no instances of mapped high quality natural heritage wetlands were noted. However, areas of black snake root (*Sanicula marilandica*) were noted to occur in the vicinity of the study area. As such, an in-depth plant survey of the study area was conducted. No black snake root was identified within the study area boundaries. Please refer to the Grette Associates Plant Survey document for a summary of the plant species found within the study area (Grette Associates 2012; Appendix B).

4.4 SOIL INFORMATION

The Natural Resource Conservation Service's (NRCS) Soil Survey of Okanogan County Area, Washington identifies two soil series present within the study area: Wapal stony

ashy coarse sandy loam, 0 to 15 percent slopes (392) and Boesel fine sandy loam, 0 to 3 percent slopes (119) (Harrington 2008; Figure 4).

Figure 4. NRCS soil survey data.



Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes (392) is a somewhat excessively drained soil. The parent material is mixed volcanic ash 7 to 14 inches thick over glacial outwash. In a typical profile, the surface layer (0 to 4 inches) is stony ashy coarse sandy loam. The next layer (4 to 11 inches) is very gravelly ashy coarse sandy loam. From 11 to 32 inches the layer is extremely cobbly loamy coarse sand. From 32 to

60 inches the layer is very gravelly loamy coarse sand. The average depth to the restrictive layer is 10 to 20 inches to strongly contrasting textural stratification (NRCS 2012). Wapal stony ashy coarse sandy loam is not considered a hydric soil.

Boesel fine sandy loam, 0 to 3 percent slopes (119) is a moderately well drained soil formed in alluvium in stream terraces. In a typical profile, the surface layer (0 to 8 inches), the soil is a fine sandy loam. The fine sandy loam generally continues into the next soil horizon (8 to 27 inches). From 27 to 37 inches, the soil is loamy sand. From 37 to 60 inches the soil is very gravelly coarse sand (NRCS 2012). The restrictive feature is generally 20 to 40 inches to strongly contrasting textural stratification. Boesel fine sandy loam is not considered a hydric soil.

5 RESULTS

The site assessment identified two wetland areas (Wetlands A and B) within the study area. Wetland A is hydrogeomorphically classified as riverine wetland; Wetland B is hydrogeomorphically classed as a depressional wetland. Indicators of wetland hydrology, hydric soil characteristics, and dominant hydrophytic vegetation observed at the wetlands are summarized in Table 5 below.

Table 5. Wetland indicator summary.

Wetland ID	Hydric Soil Indicators	Wetland Hydrology Indicators	Hydrophytic Vegetation	Dominant Plant Community
A	Sandy Redox, Stripped Matrix	Sediment Deposits Drift deposits Oxidized Rhizospheres Dry-Season water table FAC-neutral Test	Dagger leaf Rush (FACW) Inflated Sedge (OBL) Small Fruited Bulrush (OBL) Reed Canary Grass (FACW)	Emergent
B	Sandy Redox	Water Stained Leaves Sparsely Vegetated Concave Surface	Pacific Willow (FACW) Small Fruited Bulrush (OBL) Reed Canary Grass (FACW) Field Horsetail (FAC)	Forested/ Emergent

5.1 WETLAND A

Wetland A is a Riverine Emergent Seasonally Flooded Wetland approximately 1,229 square feet in size. Wetland A is located in a relatively narrow strip along the bank of the Chewuch River, over approximately 113 linear ft. Wetland A is limited to the lower portion of the river bank by the abrupt change in elevation. The three wetland criteria are discussed below.

5.1.1 *Vegetation*

Ungrazed, herbaceous plants cover more than two thirds of Wetland A. Dominant herbaceous species found within the wetland include reed canarygrass (FACW), dagger leaf rush (FACW), small fruited bulrush (OBL), and inflated sedge (OBL). The adjacent upland is also dominated by hydrophytic vegetation, primarily shrubs such as red osier dogwood (FACW), black cottonwood (FAC), and Pacific willow (FACW). However, the

vegetative community includes much more coverage of upland species, such as thimbleberry (FACU), snowberry (FACU), and Ponderosa pine (FACU), though upland species provide only approximately 30% of the total vegetative coverage. Based on the dominance of hydrophytic plant species, the vegetation criterion for a wetland is passed.

5.1.2 *Hydrology*

Hydrologic support for Wetland A is provided by the Chewuch River, as the wetland is located along its bank. Primary indicators of wetland hydrology observed within Wetland A include sediment deposits, drift deposits, and oxidized rhizospheres. Secondary indicators observed include dry season water table and passing of the FAC Neutral Test. In the nearby upland data plot, no hydrologic indicators were observed. Thus, the hydrology criterion is passed.

5.1.3 *Hydric Soils*

Soils within Wetland A are mapped as Boesel fine sandy loam, 0 to 3 percent slopes (119). Soil test pits were examined to depths up to 17 inches. The soil profile contained a surface layer (0 to 9 inches) composed of black (10YR 2/1) sand with organic matter. Redox features were dark yellowish brown (10YR 4/6). The subsoil (9 to 17 inches) was found to be composed of a grayish brown sand (2.5Y 5/2). Redox features within the subsoil profile were dark yellowish brown (10YR 4/6), similar to in the surface layer. These soils satisfied the "Sandy Redox" and "Stripped Matrix" hydric soils field indicators according to the Regional Supplement (Corps 2010). Soils in the surrounding upland consisted of very dark grayish brown (10YR 3/2) sandy loam from 0-7 inches, then brown (10YR 5/3) sand from 7-9 inches, and very dark grayish brown (10YR 3/2) sandy loam from 9 to 24 inches. Based on observed soils, the hydric soils criterion is passed.

5.2 WETLAND B

Wetland B is a Palustrine Forested Seasonally Flooded Wetland approximately 8,068 square feet in size. Wetland B is classified as a depressional wetland and is located in a large depression on the property. The three wetland criteria are discussed below.

5.2.1 *Vegetation*

Vegetation within Wetland B is largely dominated by herbaceous species such as reed canary grass (FACW), small fruited bulrush (OBL) and field horsetail (FAC). Black cottonwood and Ponderosa pine are present around the fringes of the wetland and sparsely within the wetland. Vegetative cover is a mosaic, as some areas are either sparsely vegetated or unvegetated. The more strongly hydrophytic species, such as small-fruited bulrush, are present in the northeastern portion of the wetland, transitioning to more facultative species in the southwestern portion of the site. Surrounding upland species include black cottonwood (FAC), Ponderosa pine (FACU), snowberry (FACU), nootka rose (FAC), and clematis (FACU). Based on the dominance of hydrophytic plant species, the vegetation criterion for a wetland is passed.

5.2.2 *Hydrology*

Hydrologic support for Wetland B is provided primarily by direct precipitation and water table. Indicators of wetland hydrology observed within Wetland B include soil saturation at 10 inches, water stained leaves and sparsely vegetated concave surface. The fringes of the wetland area contained very weak wetland indicators, likely influenced by the time of the site visit being late summer. No hydrologic indicators were observed in the surrounding upland plots. Based on the observation of three primary indicators, the site passes the criterion for wetland hydrology.

5.2.3 *Hydric Soils*

Soils within Wetland B are mapped by the NRCS Soil Survey of Okanogan County as Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes (392). Soil test pits were examined to depths up to 20 inches. In a typical soil profile, the surface layer (0-4 inches) is composed of black organic matter (10YR 2/1). The subsoil (4 to 14 inches) consists of grayish brown sand (2.5YR 5/2) sand with very dark gray (2.5Y 5/2) and dark yellowish brown (10YR 4/6) redox features. These soils satisfied the "Sandy Redox" hydric soils field indicator according to the Regional Supplement (Corps 2010). Upland soils consist of very dark brown (10YR 2/2) loam. Based on soils observed within the depression, the site passes the hydric soils criterion.

6 DISCUSSION

6.1 FUNCTIONS AND VALUES

Wetlands provide a number of values and functions, such as fish and wildlife habitats, natural water quality improvement, flood storage, shoreline erosion protection and opportunities for recreation and aesthetic appreciation. Protecting wetlands can, in turn, protect our health and safety by reducing flood damage and preserving water quality. Although every wetland serves some function, the type and the degree to which a particular function is served varies from wetland to wetland.

To rate the relative functions of a certain wetland in comparison to other wetlands in the region, Ecology has developed the *Washington State Wetland Rating System for Eastern Washington* (Hruby 2004). This rating system categorizes wetlands using a function-based approach. Possible ratings range from Category I (highest-quality) to Category IV (lowest-quality). Wetlands are categorized based on their potential and opportunity to perform certain water quality, hydrologic, and habitat functions. These functions include filtering runoff, reducing flooding and erosion, and providing diverse and undisturbed habitat for a variety of wildlife species. Relative values are assigned based on the numeric level reached for each identified function (Table 6). Values assigned are based on the maximum points for each function with the upper 1/3 as being high, the lower 1/3 as being low, and the remainder as being moderate (Table 7).

Table 6. Wetland relative functional value range matrix.

Function	High	Moderate	Low
Water Quality	24-32	11-23	1-10
Hydrologic	24-32	11-23	1-10
Habitat	24-36	13-23	1-12

Table 7. Study Area Wetland rating and categorization summary.

Wetland	Size (sq ft)	Cowardin Class	HGM Class	Water Quality	Hydrology	Habitat	Total	Category
A	1,229	RES	Riverine	5 (Low)	10 (low)	27 (high)	42	III
B	8,068	PFOS	Depressional	20 (moderate)	8 (low)	25 (high)	53	II

Based on the wetland rating form, Wetland A rates as a **Category III** wetland and Wetland B rates as a **Category II** wetland. Wetlands A and B both score low for hydrologic function. However, as Wetland A and Wetland B are different wetland classes (riverine and depressional respectively) the reasons for the low scores associated with hydrologic function are different. Wetland A scores low on hydrologic function because it provides minimal overbank storage, and as such has limited opportunity to reduce flooding and stream degradation. Wetland B scores as having low hydrologic function as

a result of limited opportunity to reduce flooding and erosion due to its position in the landscape as well as minimal water storage during wet periods as evidenced by limited ponding marks.

Wetlands A and B both score high for habitat function. As the habitat questions are the same for all hydrogeomorphic classes, Wetland A and Wetland B obtained high scores for habitat for similar reasons, including: interspersion of habitat, special habitat features found within the wetland such as snags and large woody debris, the intact nature of the associated buffer area and the relative proximity of priority habitats.

Wetlands A and B score differently on water quality functionality. Wetland A scores low on water quality functionality. The reason Wetland A scores low is that it has very limited or no opportunity to improve water quality. Conversely, Wetland B scores moderate on water quality functionality because grazing occurs within 150 feet of the wetland. Thus, Wetland B has the opportunity to improve water quality.

Scoring for specific elements of each wetland function are determined by the Wetland Rating Forms, which are provided in Appendix C.

6.2 REGULATORY CONSIDERATIONS

Wetland buffer widths and mitigation requirements in Okanogan County are determined based on the wetland rating. Standard buffer widths for low intensity development are presented in Chapter 14.12.640 of the Okanogan County Code (OCC). The standard wetland buffer width for Category II wetland (e.g. Wetland B) in the vicinity of low-intensity land-use is **75 ft**. The standard wetland buffer width for Category III wetland (e.g. Wetland A) in the vicinity of low-intensity land-use is 50 ft. However, per OCC chapter 14.12.570, all Category II and III wetlands under 2,500 sq ft are exempt from regulation. Thus, Wetland A, being 1,229 sq ft, is not regulated under OCC, and the 50-ft buffer does not apply.

Except as otherwise specified, wetland buffer zones shall be retained in their natural conditions (see OCC Chapter 14.12.640 for exceptions). Filling or otherwise disturbing wetlands is generally prohibited by Okanogan County. Where impacts to the wetland buffer are unavoidable, a Wetland Management and Mitigation Plan is required pursuant to OCC 14.12.650.

Non-isolated wetlands are also regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. If the USACE were to exert jurisdiction, a Section 404 permit from the USACE would only be required if filling, grading, vegetation removal or other development activities are proposed within the limits of the wetland. The Corps project manager for the Okanogan County area should be contacted prior to any proposed activity occurring within the wetland to determine if a USACE permit is necessary.

In addition, if any proposed wetland alteration requires a federal permit, an Ecology Individual 401 Water Quality Certification and Coastal Zone Management Consistency

determination would also be required. Ecology regulates all wetlands under the State Clean Water Act (RCW 90.48).

7 Bibliography

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EIGHTMILE SITE – COHO ACCLIMATION POND PROJECT

WETLAND DELINEATION REPORT - PHOTOGRAPHS

Photograph 1. Wetland A, facing downstream.

Photograph 2. Wetland B, facing north.

Photograph 3. Wetland B.

EIGHTMILE SITE – COHO ACCLIMATION POND PROJECT

WETLAND DELINEATION REPORT
ATTACHMENT A: WETLAND DATA SHEETS

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-1a
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Slope | Local relief (concave☐, convex☐, none☒: | Slope (%): 33
Subregion (LRR): A | Lat: 48.5916163° Long: -120.1655302° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: RES
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☒ No ☐**
Hydric soils present?	Yes ☒ No ☐	
Wetland hydrology present?	Yes ☒ No ☐	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ = Total Cover		
Herb Stratum (Plot size:)			
1. *Phalaris arundinacea*	30	Y	FACW
2. *Juncus ensifolius*	20	Y	FACW
3. *Carex exsiccata*	20	Y	OBL
4. *Scirpus microcarpus*	20	Y	OBL
5. *Equisetum pratense*	10	N	FACW
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	**Multiply by:**
OBL species _____	**x 1 =** _____
FACW species _____	**x 2 =** _____
FAC species _____	**x 3 =** _____
FACU species _____	**x 4 =** _____
UPL species _____	**x 5 =** _____
Column Totals _____ (A)	_____(B)

Prevalence index = B/A = _____

Hydrophytic Vegetation indicators:

☒ 1 – Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0[1]
☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
☐ 5 – Wetland non-vascular plants[1]
☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-1a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-9	10YR 3/1	60	10YR 4/6	40	C	M	Sand	Organic material
9-17+	2.5Y 5/2	100	--				Silt loam	

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☒ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☒ Sediment Deposits (B2)
- ☒ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☒ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present?	Yes ☐ No ☒	Depth (in.) near river
Water Table Present?	Yes ☐ No ☒	Depth (in.) _____
Saturation Present? (includes capillary fringe)	Yes ☐ No ☒	Depth (in.) _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-2a
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Slope | Local relief (concave☐, convex☐, none☒: | Slope (%): 33
Subregion (LRR): A | Lat: 48.5916439° Long: -120.1655905° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: RES
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☐ No ☒**
Hydric soils present?	Yes ☐ No ☒	
Wetland hydrology present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus ponderosa*	20	Y	FACU
2. *Populus balsamifera ssp. trichocarpa*	20	Y	FAC
3. *Alnus rubra*	10	Y	FAC
4. _____	_____	_____	_____
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Crataegus douglasii*	20	Y	FAC
2. *Cornus sericea*	20	Y	FACW
3. *Symphoricarpos albus*	20	Y	FACU
4. *Salix lucida var. lasiandra*	15	N	FACW
5. *Alnus incana*	10	N	FACW
6. *Amelanchier alnifolia*	10	N	FACU
	95	= Total Cover	
Herb Stratum (Plot size:)			
1. *Solidago canadensis*	20	Y	FACU
2. *Rubus parviflorus*	20	Y	FACU
3. *Agrostis alba*	20	Y	NI
4. *Carex pellita*	20	Y	OBL
5. *Eurybia conspicua*	10	N	NI
6. *Equisetum hyemale*	5	N	FACW
7. *Rubus idaeus*	<5	N	FACU
8. _____	_____	_____	_____
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 10 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	**Multiply by:**
OBL species _____	**x 1 =** _____
FACW species _____	**x 2 =** _____
FAC species _____	**x 3 =** _____
FACU species _____	**x 4 =** _____
UPL species _____	**x 5 =** _____
Column Totals _____ (A)	_____(B)

Prevalence index = B/A = _____

Hydrophytic Vegetation indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
- ☐ 5 – Wetland non-vascular plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-2a

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-7	10YR 3/2	100					Sandy loam	
7-9	10YR 5/3	100					Sand	
9-24+	10YR 3/2	100					Sandy loam	

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in.) _____

Water Table Present? Yes ☐ No ☒ Depth (in.) _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in.) _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-U1
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Flat | Local relief (concave☒, convex☐, none☐: | Slope (%): NA
Subregion (LRR): A | Lat: 48.5920799° Long: -120.1657902° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: _____
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☐ No ☒**
Hydric soils present?	Yes ☐ No ☒	
Wetland hydrology present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera ssp. trichocarpa*	40	Y	FAC
2. _____			
3. _____			
4. _____			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Cornus sericea*	20	Y	FACW
2. *Symphoricarpos albus*	20	Y	FACU
3. *Pinus ponderosa*	10	Y	FACU
4. *Rosa nutkana*	<5	N	FAC
5. _____			
6. _____			
	~55	= Total Cover	
Herb Stratum (Plot size:)			
1. *Carex pellita*	30	Y	OBL
2. *Solidago canadensis*	30	Y	FACU
3. *Equisetum hyemale*	5	N	FACW
4. *Equisetum arvense*	5	N	FAC
5. *Maianthemum stellatum*	5	N	FAC
6. *Eurybia conspicua*	5	N	NI
7. _____			
8. _____			
	80	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. _____			
2. _____			
		= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		**Multiply by:**	
OBL species	30	**x 1 =**	30
FACW species	25	**x 2 =**	50
FAC species	55	**x 3 =**	165
FACU species	30	**x 4 =**	120
UPL species	_____	**x 5 =**	_____
Column Totals	140 (A)		365 (B)

Prevalence index = B/A = 2.6

Hydrophytic Vegetation indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☒ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
- ☐ 5 – Wetland non-vascular plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-U1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					Sandy loam	
16-24+	2.5Y 4/2	80	10YR 3/6	20	C	M	Sand	

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☐ No ☒

Remarks: Redox features too far below the surface

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in.) _____

Water Table Present? Yes ☐ No ☒ Depth (in.) _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in.) _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-1b
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Flat | Local relief (concave☒, convex☐, none☐: | Slope (%): NA
Subregion (LRR): A | Lat: 48.5925133° Long: -120.1655315° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☒ No ☐**
Hydric soils present?	Yes ☒ No ☐	
Wetland hydrology present?	Yes ☒ No ☐	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera ssp. trichocarpa*	40	Y	FAC
2. *Salix lucida var/ lasiandra*	20	Y	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
	_____	= Total Cover	

Herb Stratum (Plot size:)			
1. *Scirpus microcarpus*	60	Y	OBL
2. *Phalaris arundinacea*	20	Y	FACW
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
	80	= Total Cover	

Woody Vine Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	**Multiply by:**
OBL species _____	**x 1 =** _____
FACW species _____	**x 2 =** _____
FAC species _____	**x 3 =** _____
FACU species _____	**x 4 =** _____
UPL species _____	**x 5 =** _____
Column Totals _____ (A)	_____(B)

Prevalence index = B/A = _____

Hydrophytic Vegetation indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
- ☐ 5 – Wetland non-vascular plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-1b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-4	10YR 2/1	100					Organic	
4-14+	2.5Y 5/2	80	10YR 4/6	10	C	M	Sand	
			2.5Y 2/1	10	C	M	Sand	

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in.) _____

Water Table Present? Yes ☒ No ☐ Depth (in.) 14

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (in.) 10

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-2b
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Flat | Local relief (concave☒, convex☐, none☐: | Slope (%): NA
Subregion (LRR): A | Lat: 48.5924182° Long: -120.1655408° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☒ No ☐**
Hydric soils present?	Yes ☒ No ☐	
Wetland hydrology present?	Yes ☒ No ☐	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera ssp. trichocarpa*	30	Y	FAC
2. *Pinus ponderosa*	30	Y	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
	_____	= Total Cover	
Herb Stratum (Plot size:)			
1. *Equisetum arvense*	20	Y	FAC
2. *Phalaris arundinacea*	20	Y	FACW
3. *Maianthemum stellatum*	<5	Y	FAC
4. *Poa pratensis*	<5	Y	FAC
5. *Scirpus microcarpus*	<5	Y	OBL
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
	~50	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 86% (A/B)

Prevalence Index worksheet:

Total % Cover of:	**Multiply by:**
OBL species _____	**x 1 =** _____
FACW species _____	**x 2 =** _____
FAC species _____	**x 3 =** _____
FACU species _____	**x 4 =** _____
UPL species _____	**x 5 =** _____
Column Totals _____ (A)	_____(B)

Prevalence index = B/A = _____

Hydrophytic Vegetation indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
- ☐ 5 – Wetland non-vascular plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-2b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/2	70	7.5YR 5/8	30	C	M	Sand	

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☒ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Sparsely Vegetated Concave Surface (B8)
- ☒ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in.) _____

Water Table Present? Yes ☐ No ☒ Depth (in.) _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in.) _____

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-3b
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Flat | Local relief (concave☒, convex☐, none☐: | Slope (%): NA
Subregion (LRR): A | Lat: 48.5923611° Long: -120.1651348° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☐ No ☒**
Hydric soils present?	Yes ☐ No ☒	
Wetland hydrology present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera ssp. trichocarpa*	70	Y	FAC
2. _____			
3. _____			
4. _____			
	70	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Symphoricarpos albus*	50	Y	FACU
2. *Rosa nutkana*	20	Y	FAC
3. *Maiantuemum stallatum*	20	Y	FAC
4. *Clematis ligusticifolia*	10	N	FAC
5. _____			
6. _____			
	100	= Total Cover	
Herb Stratum (Plot size:)			
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	_____	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. _____			
2. _____			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	**Multiply by:**
OBL species _____	**x 1 =** _____
FACW species _____	**x 2 =** _____
FAC species 120	**x 3 =** 360
FACU species 50	**x 4 =** 200
UPL species _____	**x 5 =** _____
Column Totals 170 (A)	560 (B)

Prevalence index = B/A = 3.3

Hydrophytic Vegetation indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
- ☐ 5 – Wetland non-vascular plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-3b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/2	100						

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in.) _____

Water Table Present? Yes ☐ No ☒ Depth (in.) _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in.) _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Eightmile River Site | City/County: Okanogan | Sampling Date: 8/15/12
Applicant/Owner: Yakime Tribe | State: WA | Sampling Point: SP-4b
Investigator(s): JLD/Grette Associates | Section: 26 Township: 36 Range: 21
Landform (hillslope, terrace, etc.): Flat | Local relief (concave☒, convex☐, none☐: | Slope (%): NA
Subregion (LRR): A | Lat: 48.5926466° Long: -120.1656959° | Datum: _____
Soil Map Name: Wapal stony ashy coarse sandy loam, 0 to 15 percent slopes | NWI Classification: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks)
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐ Soil ☐, or Hydrology ☐ significantly problematic? (If needed, explain in Remarks)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic vegetation present?	Yes ☒ No ☐	**Is the sampled area within a wetland? Yes ☐ No ☒**
Hydric soils present?	Yes ☐ No ☒	
Wetland hydrology present?	Yes ☐ No ☒	

Remarks:

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Populus balsamifera ssp. trichocarpa*	40	Y	FAC
2. _____			
3. _____			
4. _____			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Symphoricarpos albus*	30	Y	FACU
2. *Amelanchier alnifolia*	20	Y	FACU
3. *Crataegus douglasii*	10	N	FAC
4. _____			
5. _____			
6. _____			
	60	= Total Cover	
Herb Stratum (Plot size:)			
1. *Bromus ciliatus*	60	Y	FAC
2. *Equisetum arvense*	20	Y	FAC
3. *Maianthemum stellatum*	10	N	FAC
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1. _____			
2. _____			
	_____	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species that are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species that are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:	**Multiply by:**
OBL species _____	**x 1 =** _____
FACW species _____	**x 2 =** _____
FAC species 140	**x 3 =** 420
FACU species 50	**x 4 =** 200
UPL species _____	**x 5 =** _____
Column Totals 190 (A)	620 (B)

Prevalence index = B/A = 3.3

Hydrophytic Vegetation indicators:

- ☐ 1 – Rapid Test for Hydrophytic Vegetation
- ☒ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is ≤3.0[1]
- ☐ 4 - Morphological Adaptations[1] (provide supporting data in Remarks or on a separate sheet)
- ☐ 5 – Wetland non-vascular plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic vegetation present? Yes ☒ No ☐

Remarks:

SOIL

Sampling Point: SP-4b

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Sandy Loam	
8-20+	10YR 2/2	100					Sandy Loam	

[1]Type: C=Concentration; D=Depletion; RM=Reduced matrix; CS=Covered or Coated Sand Grains. [2] Location: PL=Pore linings; M=Matrix

Hydric Soils Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Material (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Material (F1) **(except MLRA 1)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) **(except MLRA 1, 2, 4A, and 4B)**
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) **(LRR A)**
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) **(MLRA 1, 2, 4A, and 4B)**
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) **(LRR A)**
- ☐ Frost-Heave Hummocks (D7)

Field Observations

Surface Water Present? Yes ☐ No ☒ Depth (in.) _____

Water Table Present? Yes ☐ No ☒ Depth (in.) _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (in.) _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

EIGHTMILE SITE – COHO ACCLIMATION POND PROJECT

WETLAND DELINEATION REPORT
ATTACHMENT B: PLANT SURVEY

EIGHTMILE SITE – COHO ACCLIMATION POND PROJECT

PLANT SURVEY REPORT
OKANOGAN COUNTY, WA

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

EIGHTMILE SITE – COHO ACCLIMATION POND PROJECT

PLANT SURVEY REPORT
OKANOGAN COUNTY, WA

PREPARED FOR:

YAKAMA NATION

PREPARED BY:

GRETTE ASSOCIATES[LLC]
151 SOUTH WORTHEN, SUITE 101
WENATCHEE, WASHINGTON 98801
(509) 663-6300

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

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1 INTRODUCTION

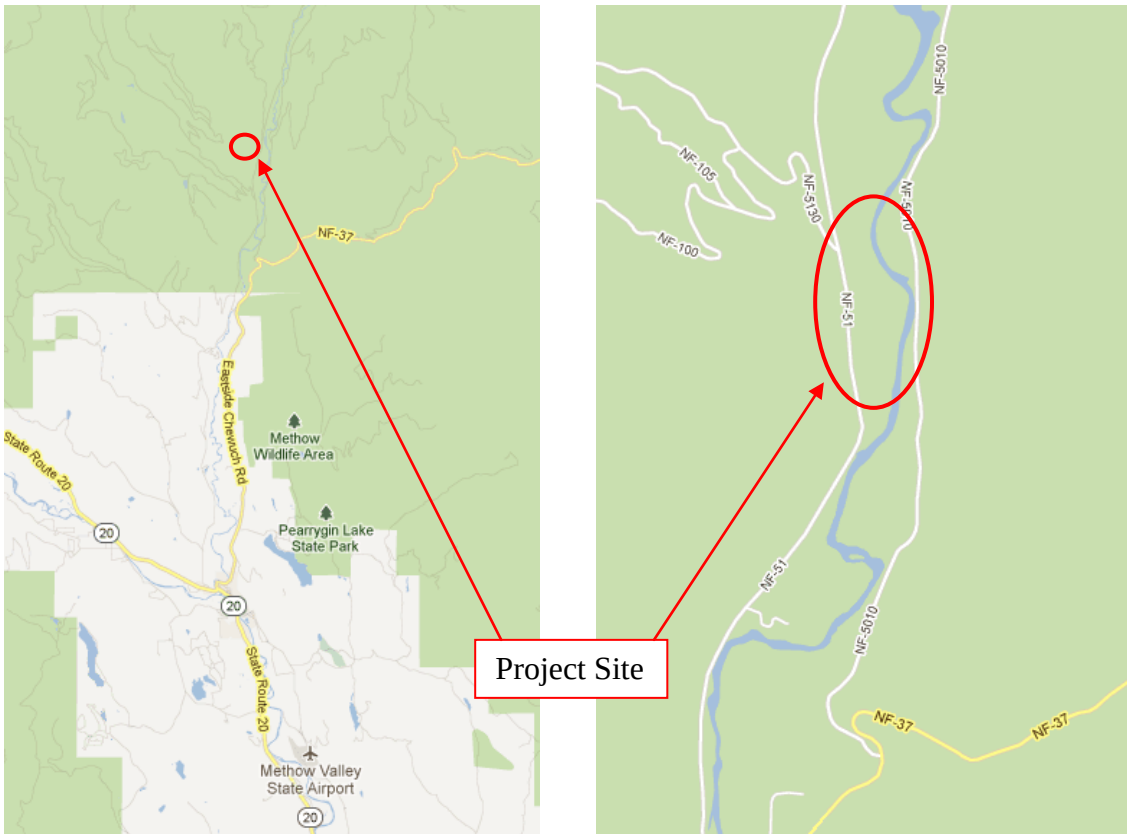
The Yakama Nation has contracted with Grette Associates[LLC] to perform a plant survey within an area known as Eightmile along the Chewuch River in the Okanogan National Forest in Okanogan County. The survey was performed in support of constructing an acclimation pond for juvenile coho salmon (*Oncorhynchus kitsutch*) on the site. This work was completed in Section 26, Township 36, Range 21 East, W.M.

Grette Associates staff biologists visited the site and performed plant survey work on August 15, 2012.

2 BACKGROUND INFORMATION

The Eightmile study area is located along the Chewuch River within the Okanogan National Forest in Okanogan County. To access the site, continue on State Route 20 into the City of Winthrop, turn left to remain on State Route 20. Take the first right onto Westside Chewuch and continue 8.7 miles to the site, on the right.

Figure 1. Vicinity maps.



3 METHODS

3.1 IDENTIFICATION OF POTENTIAL RARE PLANT SPECIES WITHIN THE SURVEY AREA

Prior to conducting field analysis, Grette associates staff developed a list of potential rare plant species which may occur in the survey area based upon rand and habitat requirements. The Washington State Department of Natural Resources (WDNR) Natural Heritage Information System was queried. As a result of the DNR query, mapped areas that may support black snake root (*Sanicula marilandica*) were noted to occur in the vicinity of the survey area.

Photo Source: http://www.prairieresto.com/ItemDisplay.php?i=255&cID=10

Black Snake Root is a perennial with a cluster of fibrous roots extending from a short, simple crown. It has a solitary erect stem generally between 16 and 48 inches tall (Hitchcock et al. 1961). The flowers are greenish-white. The leaves are palmately cleft and have a superficial resemblance to false bugbane (*Trautvetteria caroliniensis*) and palmate coltsfoot (*Petasites palmatus*). Species commonly associated with Black Snake root include: Engelmann's spruce (*Picea engelmannii*), Western red cedar (*Thuja plicata*), black cottonwood (*Populus balsamifera ssp. trichocarpa*), water birch (*Betula occidentalis*), mountain alder (*Alnus incana*), red osier dogwood (*Cornus sericea*), bunchberry dogwood (*Cornus canadensis*), prickly currant (*Ribes lacustre*), twinflower (*Linnaea borealis*), Queen's cup (*Clintonia uniflora*), and wild sarsaparilla (*Aralia nudicaulis*).

General habitat for Black Snake Root is moist, low ground including meadows, riparian flood plains, moist woods and marshes. Black snakeroot's wetland indicator status is "FAC". Within the state of Washington, this species is thought to occur within Okanogan, Ferry, Pend Oreille, and Stevens counties in the Eastern Cascades and Okanogan Highlands physiographic provinces. Black Snake Root is generally identifiable in the field from June to mid-August.

3.2 FIELDWORK

In order to determine if black snakeroot was growing on the subject property, a site visit was conducted on August 15, 2012. As noted in section 3.1, Black Snakeroot is generally identifiable from June to mid-August. Staff with education and field application backgrounds in plant identification conducted a plant survey of the survey area (Figure 2).

Figure 2. Plant survey transect diagram.

Staff biologists designed the survey such that 100% coverage of the entire study area was achieved. Two biologists walked transects of the study area, maintaining spacing such that visual coverage of the entire area was achieved. In order to achieve this, biologists remained approximately 50 ft apart, though this spacing varied with the density and nature of vegetative coverage. Vegetation within the survey area is comprised primarily of herbaceous and scrub-shrub strata. As such, field staff were also able to see plant species between transects.

4 RESULTS

An alphabetical summary of the plants identified during the plant survey is provided in Table 1. Black Snakeroot was not identified within the survey area.

Table 1. List of plant species observed in the Study Area

Latin Name	Common Name
Actaea rubra	Baneberry
Agrostis alba	creeping bentgrass
Alnus rubra	Red alder
Amelanchier alnifolia	Serviceberry
Angelica arguta	Angelica
Apocynum androsaemifolium	Spreading dogbane
Betula occidentalis	Water birch
Betula papyrifera	Paper birch
Carex intumescens	Inflated Sedge
Carex pellita	Wooly sedge
Centaurea diffusa	Diffuse knapweed
Centaurea repens	Russian knapweed
Clematis ligusticifolia	White clematis
Conyza canadensis	Horseweed
Cornus sericea	Red osier dogwood
Crataegus douglasii	Douglas hawthorn
Dactylis glomerata	Orchard grass
Elymus glaucus	Blue wildrye
Epilobium angustifolium	Fireweed
Equisetum hyemale	Scouring rush
Equisetum pratense	Meadow horsetail
Eurybia conspicua	Showy aster
Galium aparine	Bedstraw
Heracleum maximum	Cow parsnip
Juncus ensifolius	Dagger Leaf Rush
Mahonia aquifolium	Oregon grape
Maianthemum racemosum	False Solomon's seal
Maianthemum stellatum	Star-flowered false Solomon seal
Melilotus officinalis	Yellow sweet clover
Osmorhiza chilensis	Sweet cicely
Phalaris arundinacea	Reed Canary Grass
Picea pungens	Blue spruce
Pinus ponderosa	Ponderosa pine
Poa pratensis	Kentucky bluegrass
Populus balsamifera ssp. trichocarpa	Black cottonwood
Pterospera andromeda	Pine drops
Rosa nutkana	Nootka rose

Latin Name	Common Name
Rosa woodsii	Woods rose
Rubus idaeus	Red raspberry
Rubus parviflorus	Thimbleberry
Salix lucida	pacific willow
Salix planifolia	Tea-leaf willow
Scirpus microcarpus	Small Flowered Bulrush
Shepherdia canadensis	Soopolallie
Solidago canadensis	Goldenrod
Symphoricarpos albus	Snowberry
Taraxacum officinale	Dandelion
Trifolium pratense	Red clover
Trifolium repens	White clover
Verbascum thapsus	Mullein

5 QUALIFICATIONS

Ryan Walker is a Biologist with experience in forestry, wetland biology, riparian restoration and code administration. His background includes natural resource management, land-use planning and Shoreline Management Act permitting. He is a U.S. Army Corps of Engineers-certified wetlands delineator and has completed the Department of Ecology's training course for the Washington State Wetland Rating Form for Eastern Washington and Western Washington. In addition, Ryan has training in stream typing and ordinary high water mark identification from the Washington Departments of Natural Resources and Fish and Wildlife. He has worked with local, state and federal agencies in north-central Washington on environmental permitting issues for over 12 years. Ryan is based in Wenatchee and is one of the primary biologists for projects within Chelan County.

Jay Dirkse is a plant biologist with Grette Associates LLC. Jay holds a B.S. in Biology from Whitworth University (2003), and an M.S. in Environmental Science from Washington State University (2006). Jay has over seven years' experience as a biologist, having begun working as a biologist with Grette Associates in June, 2005. Since then, Jay has had extensive experience with critical areas, wetlands, and aquatic permitting in Douglas, Chelan, Okanogan, and Grant Counties, as well as extensive marine permitting and environmental assessment for projects in Puget Sound. Jay is also an experienced wetland delineator.

6 REFERENCES

Hitchcock, C. L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1961. Vascular Plants of the Pacific Northwest, Part 3:Saxifragaceae to Ericaceae. University of Washington Press, Seattle. 614 pp.

U.S. Fish and Wildlife Service. 1988. National list of vascular plant species that occur in wetlands. USFWS Biological Report 88 (24).

EIGHTMILE SITE – COHO ACCLIMATION POND PROJECT

WETLAND DELINEATION REPORT
ATTACHMENT C: WETLAND RATING FORMS

Wetland name or number _____

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Eightmile Wetland A Date of site visit: 8/15/12

Rated by RW, JD; Grette Associates Trained by Ecology? Yes ✓ No ___ Date of training 9/05

SEC: 26 TWNSHP: 36 RNGE: 21 Is S/T/R in Appendix D? Yes ___ No ✓

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I___ II___ III ✓ IV___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for "Water Quality" Functions	5
Score for Hydrologic Functions	10
Score for Habitat Functions	27
TOTAL score for functions	42

Category based on SPECIAL CHARACTERISTICS of wetland

I___ II___ III___ Does not Apply ✓

Final Category (choose the "highest" category from above) III

Summary of basic information about the wetland unit

Wetland Type		Wetland Class	
Vernal Pool		**Depressional**	
Alkali		**Riverine**	✓
Natural Heritage Wetland		**Lake-fringe**	
Bog		**Slope**	
Forest			
None of the above		Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 20 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?

___The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

___At least 30% of the open water area is deeper than 3 m (10 ft)?

NO – go to Step 2 **YES –** The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?

___The wetland is on a slope (*slope can be very gradual*),

___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

____The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

NO - go to Step 3 **YES –** The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

NO - go to Step 4 ✓ **YES –** The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to Step 5 **YES –** The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes Within One Delineated Wetland Boundary	Class to Use for Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine (riverine is within boundary of depression)	Depressional
Depressional + Lake-fringe	Depressional

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

	Riverine Wetlands WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality	**Points** (only 1 score per box)
R	**R 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p. 45)***
R	R 1.1 Area of surface depressions within the riverine unit that can trap sediments during a flooding event: Depressions cover >1/3 area of wetland points = 6 Depressions cover > 1/10 area of wetland points = 3 If depressions > 1/10th of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/10 area of wetland points = 1 No depressions present points = 0 ✓	**Figure ___** 0
R	R 1.2 Characteristics (cover) of the vegetation in the unit *(area of polygons with >90% cover at person height. This is **not** Cowardin vegetation classes)*: Forest or shrub > 2/3 the area of the wetland points = 10 Forest or shrub 1/3 – 2/3 area of the wetland points = 5 Ungrazed, herbaceous plants > 2/3 area of wetland points = 5 ✓ Ungrazed herbaceous plants 1/3 – 2/3 area of wetland points = 2 Forest, shrub, and ungrazed herbaceous < 1/3 area of wetland points = 0 Aerial photo or map showing polygons of different vegetation cover	**Figure ___** 5
R	**Total for R1** *Add the points in the boxes above*	5
R	**R 2.0 Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* — Grazing in the wetland or within 150ft — Wetland intercepts groundwater within the Reclamation Area — Untreated stormwater flows into wetland — Tilled fields or orchards within 150 feet of wetland — Water flows into wetland from a stream or culvert that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential or urban areas are within 150 ft of wetland — The river or stream that floods the wetland has a contributing basin where human activities have raised the levels of sediment, toxic compounds or nutrients in the river water above water quality standards — Other_____ **YES** multiplier is **2** ✓ **NO** multiplier is **1**	***(see p.46)*** multiplier 1
R	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from R1 by the multiplier in R2 ***Record score on p. 1 of field form***	**5**

R	**Riverine Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream degradation	**Points** (only 1 score per box)
R	**R 3.0 Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	***(see p. 47)***
R	R 3.1 Amount overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow of water and the width of the stream or river channel (distance between banks).* *Calculate the ratio: width of wetland/ width of stream.* If the ratio is 2 or more — points = 10 If the ratio is between 1 and < 2 — points = 8 If the ratio is ½ to < 1 — points = 4 If the ratio is ¼ to < ½ — points = 2 If the ratio is < ¼ — points = 1 ✓ Aerial photo or map showing average widths	**Figure ___** 1
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub" (area of polygons with >90% cover at person height. This is **not** Cowardin vegetation classes)*: Forest or shrub for more than 2/3 the area of the wetland. — points = 6 Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area — points = 4 ✓ Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area — points = 2 Vegetation does not meet above criteria — points = 0 Aerial photo or map showing polygons of different vegetation types	**Figure ___** 4
R	**Total for R3** *Add the points in the boxes above*	5
R	**R 4.0 Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** *Answer NO if the major source of water is irrigation return flow or water levels are controlled by a reservoir.* Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ✓ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ✓ There are natural resources downstream (e.g. salmon redds) than can be damaged by flooding — Other_____ ✓ **YES** multiplier is **2** **NO** multiplier is **1**	***(see p. 50)*** multiplier 2
R	**TOTAL - Hydrologic Functions** Multiply the score from R3 by the multiplier in R4 ***Record score on p. 1 of field form***	**10**

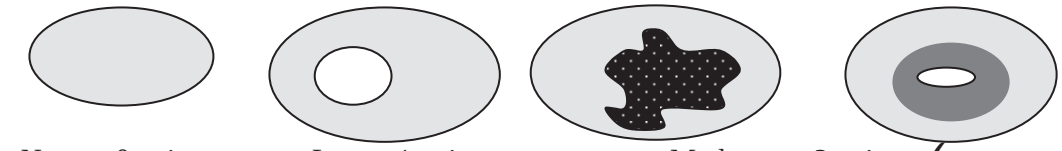
Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Categories of vegetation structure</u> ***(see p.62)***	**Figure ___**
Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is ¼ acre or more than 10% of the area if unit is < 2.5 acres. Aquatic bed Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ✓ Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ✓ Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *Add the number of vegetation types that qualify. If you have:* 4-6 types points = 3 3 types points = 2 2 types points = 1 ✓ 1 type points = 0 Map of Cowardin vegetation classes and areas with different heights of emergents	1
H 1.2. Is one of the vegetation types "aquatic bed?" ***(see p .64)*** YES = 1 point NO = 0 points	0
H 1.3. <u>Surface Water</u> ***(see p.65)*** H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? *Note: answer YES for Lake-fringe wetlands* YES = 3 points & **go to H 1.4** ✓ NO = go to H 1.3.2 H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, AND that has an unvegetated bottom (*answer yes only if H 1.3.1 is NO*)? ✓ YES = 3 points NO = 0 points Map showing areas of open water	**Figure ___** 3
H 1.4. <u>Richness of Plant Species</u> ***(see p. 66)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* If you counted: > 9 species points = 2 4-9 species ✓ points = 1 # of species ____ < 4 species points = 0 points *List species below if you wish*	1

H 1.5. Interspersion of habitats ***(see p. 67)***

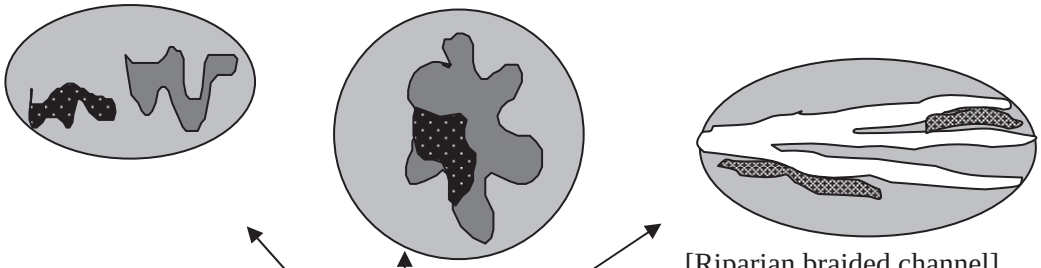
Decided from the diagrams below whether interspersion between categories of vegetation (described in H 1.1), or categories and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure ___



None = 0 points Low = 1 point Moderate = 2 points ✓

2



[Riparian braided channel]

High = 3 points

NOTE: If you have four or more vegetation categories or three vegetation categories and open water the rating is always "high". Use maps from H1.1 and H1.3

H 1.6. Special Habitat Features: ***(see p. 68)***

Check the habitat features that are present in the wetland unit. The number of checks is the number of points you put into the next column.

✓ Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.

____Cattails or bulrushes are present within the unit.

✓ Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.

____Emergent or shrub vegetation in areas that are permanently inundated/ponded. *The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.*

✓ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>45 degree slope) OR signs of recent beaver activity

Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*

Maximum score possible = 6

3

TOTAL Potential to provide habitat
Add the scores in the column above

10

Comments

H 2.0 Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 71)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed." Relatively undisturbed also means no grazing, no landscaping, no daily human use, and no structures or paving within undisturbed part of buffer.* — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference **Points = 5** ✓ 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 80ft (25 m) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <6.6ft wide (2m) for more than 95% of the circumference (e.g . tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 4
H 2.2 Wet Corridors ***(see p. 72)*** H 2.2.1 Is the wetland unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor at least ¼ mile long with surface water or flowing water throughout most of the year (> 9 months/yr)? (*dams, heavily used gravel roads, paved roads, fields tilled to edge of stream, or pasture to edge of stream are considered breaks in the corridor*). ✓ YES = 4 points (go to H 2.3) NO = go to H 2.2.2 H 2.2.2 Is the unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor, at least ¼ mile long with water flowing seasonally, **OR** a lake-fringe wetland without a "wet" corridor, **OR** a riverine wetland without a surface channel connecting to the stream? YES = 2 points (go to H 2.3) NO go to H 2.2.3 H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (*do not include man-made ditches*)? YES = 1 point NO = 0 points	4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____ **Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora ((*full description of herbaceous species found here are in WDFW PHS report p. 153*). ____**Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). Old-growth: Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. Mature: Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____ **Juniper Savannah**: All juniper woodlands (*SE part of state only; check map*) ____ **Shrub-steppe**: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover). __✓__**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____Inland Dunes This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. *(check WDFW web site)* __✓__**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ____**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **2 or more** Priority Habitats **= 4 points** ✓ If wetland has **1** Priority Habitat **= 2 points** No Priority habitats = **0 points** *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

H 2.4 Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 76)***	
— The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) **points = 5**	
✓ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing in the connection or an open water connection along a lake shore without heavy boat traffic are OK, but connections should NOT be bisected by paved roads, fill, fields, heavy boat traffic or other development) **points = 5**	5
— There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? **points = 2**	
— There is at least 1 wetland within ½ mile**.** **points = 1**	
— Does not meet any of the four criteria above **points = 0**	
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	17
H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?	
H 3.1 Indicator of reduced habitat functions ***(see p. 75)*** Do the areas of open water in the wetland unit have a resident population of carp (see text for indicators of the presence of carp)? *(NOTE: This question does not apply to reservoirs with water levels controlled by dams, such as the reservoirs on the Columbia and Snake Rivers)* YES = **- 5 points** ✓ NO = 0 points	*Points will be subtracted*
Total Score for Habitat Functions *– add the points for H 1, H 2, and H 3 and record the result on p. 1*	**27**

Comments

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools ***(see p. 79)*** Is the wetland unit **less than 4000 ft^2**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands ***(see p. 81)*** Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 2 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 2 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. YES = Category I NO – *not an alkali wetland*	**Cat. I**

SC 3.0 Natural Heritage Wetlands ***(see p. 81)***

Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.

SC 3.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)*

S/T/R information from Appendix D or accessed from WNHP/DNR database

YES – contact WNHP/DNR (see p. 79) and go to SC 3.2 NO

SC 3.2 Has DNR identified the wetland unit as a high quality undisturbed wetland or as or as a site with state threatened, endangered, or sensitive plant species? **Cat. I**

YES = Category I NO –*not a natural heritage wetland*

SC 4.0 Bogs ***(see p. 82)***

Does the wetland unit **(or any part of the wetland unit)** meet both the criteria for soils and vegetation in bogs. *Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.*

SC 4.1. Does the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)?

Yes - go to SC 4.3 No - go to SC 4.2

SC 4.2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond??

Yes - go to SC 4.3 No - *Is not a bog for rating*

SC 4.3. Does the wetland unit have more than 70% cover of mosses at ground level in any area within its boundaries, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? **Cat. I**

Yes – Category I bog No - go to Q. 4.4

NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.

SC 4.4. Is the unit, or any part of it, forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* **Cat. I**

Yes – Category I bog NO

SC 5.0 Forested Wetlands ***(see p. 85)***

Does the wetland unit have an area of forest (*you should have identified a forested class, if present, in question H 1.1*) rooted within its boundary that meet **at least one** of the following three criteria?

— The wetland is within the "100 year" floodplain of a river or stream

— aspen (*Populus tremuloides*) are a dominant or co-dominant of the "woody" vegetation. (*Dominants means it represents at least 50% of the cover of woody species, co-dominant means it represents at least 20% of the total cover of woody species*)

— There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see p. 83)*

YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*

SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees

Slow growing trees are: western red cedar (*Thuja plicata*), Alaska yellow cedar (*Chamaecyparis nootkatensis*), pine spp. mostly "white" pine (*Pinus monticola*), western hemlock (*Tsuga heterophylla*), Englemann spruce (*Picea engelmannii*).

YES = Category I NO = go to SC 5.2 **Cat. I**

SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) are a dominant or co-dominant species?

YES = Category I NO = go to SC 5.3 **Cat. I**

SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species.

Fast growing species are:
Alders – red (*Alnus rubra*), thin-leaf (*A. tenuifolia*)
Cottonwoods – narrow-leaf (*Populus angustifolia*), black (*P. balsamifera*)
Willows- peach-leaf (*Salix amygdaloides*), Sitka (*S. sitchensis*), Pacific (*S. lasiandra*), Aspen - *(Populus tremuloides*), Water Birch (*Betula occidentalis*)

YES = Category II NO = go to SC 5.5 **Cat. II**

SC 5.5 Is the forested component of the wetland within the "100 year floodplain" of a river or stream?

YES = Category II **Cat. II**

Category of wetland based on Special Characteristics

Choose the "highest" rating if wetland falls into several categories.
If you answered NO for all types enter "Not Applicable" on p.1

Wetland name or number _____

WETLAND RATING FORM – EASTERN WASHINGTON

Version 2 - Updated June 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): Eightmile Wetland B Date of site visit: 8/15/12

Rated by RW, JD; Grette Associates Trained by Ecology? Yes ✓ No ___ Date of training 9/05

SEC: 26 TWNSHP: 36 RNGE: 21 Is S/T/R in Appendix D? Yes ___ No ✓

Map of wetland unit: Figure ____ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ✓ ___ III ___ IV ___

Category I = Score >=70
Category II = Score 51-69
Category III = Score 30-50
Category IV = Score < 30

Score for "Water Quality" Functions	20
Score for Hydrologic Functions	8
Score for Habitat Functions	25
TOTAL score for functions	53

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ III ___ Does not Apply ✓

Final Category (choose the "highest" category from above) II

Summary of basic information about the wetland unit

Wetland Type		Wetland Class	
Vernal Pool		**Depressional**	✓
Alkali		**Riverine**	
Natural Heritage Wetland		**Lake-fringe**	
Bog		**Slope**	
Forest			
None of the above		Check if unit has multiple HGM classes present	

Does the wetland being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		✓
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		✓
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*		✓
SP4. *Does the wetland unit have a local significance in addition to its functions*? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		✓

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. Classifying the wetland first simplifies the questions needed to answer how it functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 20 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands for Eastern Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Does the entire wetland unit **meet both** of the following criteria?

___The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

___At least 30% of the open water area is deeper than 3 m (10 ft)?

NO – go to Step 2 **YES –** The wetland class is **Lake-fringe (lacustrine fringe)**

2. Does the entire wetland unit **meet all** of the following criteria?

The wetland is on a slope (*slope can be very gradual*),

The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.

____The water leaves the wetland **without being impounded**?

NOTE: *Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than a foot deep).*

NO - go to Step 3 **YES –** The wetland class is **Slope**

3. Is the entire wetland unit in a valley or stream channel where it gets inundated by overbank flooding from that stream or river? In general, the flooding should occur at least once every ten years to answer "yes." *The wetland can contain depressions that are filled with water when the river is not flooding.*

NO - go to Step 4 **YES –** The wetland class is **Riverine**

4. Is the entire wetland unit in a topographic depression, outside areas that are inundated by overbank flooding, in which water ponds, or is saturated to the surface, at some time of the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to Step 5 ✓ **YES –** The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes Within One Delineated Wetland Boundary	Class to Use for Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine (riverine is within boundary of depression)	Depressional
Depressional + Lake-fringe	Depressional

If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

D	**Depressional Wetlands** WATER QUALITY FUNCTIONS - Indicators that the wetland functions to improve water quality	**Points** (only 1 score per box)
D	**D 1.0 Does the wetland unit have the <u>potential</u> to improve water quality?**	***(see p. 38)***
D	D 1.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet - points = 5 ✓ Wetland has an intermittently flowing outlet points = 3 Wetland has a highly constricted permanently flowing outlet points = 3 Wetland has a permanently flowing surface outlet points = 1	5
D	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions of soil types)* YES points = 3 NO points = 0 ✓	0
D	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class) Wetland has persistent, ungrazed, vegetation for > 2/3 of area points = 5 ✓ Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area points = 1 Wetland has persistent, ungrazed vegetation <1/10 of area points = 0 Map of Cowardin vegetation classes	**Figure** ___ 5
D	D 1.4 Characteristics of seasonal ponding or inundation. *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland points = 3 Area seasonally ponded is ¼ - ½ total area of wetland points = 1 Area seasonally ponded is < ¼ total area of wetland points = 0 ✓ NOTE: *See text for indicators of seasonal and permanent inundation/flooding.* Map of Hydroperiods	**Figure** ___ 0
D	**Total for D 1** *Add the points in the boxes above*	**10**
D	**D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ✓ Grazing in the wetland or within 150 ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other_____ ✓ **YES** multiplier is **2** **NO** multiplier is **1**	multiplier 2
D	**<u>TOTAL</u> - Water Quality Functions** Multiply the score from D1 by the multiplier in D2 ***Record score on p. 1 of field form***	20

D	**Depressional Wetlands** HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion	**Points** (only 1 score per box)
D	**D 3.0 Does the wetland unit have the <u>potential</u> to reduce flooding and stream erosion?**	***(see p. 39)***
D	D 3.1 Characteristics of surface water flows out of the wetland unit: Wetland has no surface water outlet points = 8 ✓ Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing surface outlet points = 0	8
D	D 3.2 Depth of storage during wet periods: *Estimate the height of ponding above the surface of the wetland (see text for description of measuring height). In wetlands with permanent ponding, the surface is the lowest elevation of "permanent" water)* Marks of ponding are at least 3 ft above the surface points = 8 The wetland is a "headwater" wetland" *(see p. 39)* points = 6 Marks are 2 ft to < 3 ft from surface points = 6 Marks are 1 ft to < 2 ft from surface points = 4 Marks are 6 in to < 1 ft from surface points = 2 No marks above 6 in. or wetland has only saturated soils points = 0 ✓	0
D	**Total for D 3** *Add the points in the boxes above*	8
D	**D 4.0 Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?** *Answer NO if the major source of water is groundwater, irrigation return flow, or water levels in the wetland are controlled by a reservoir.* Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other_____ **YES** multiplier is **2** ✓ **NO** multiplier is **1**	***(see p. 42)*** multiplier 1
D	**TOTAL - Hydrologic Functions** Multiply the score from D3 by the multiplier in D4 ***Record score on p. 1 of field form***	**8**

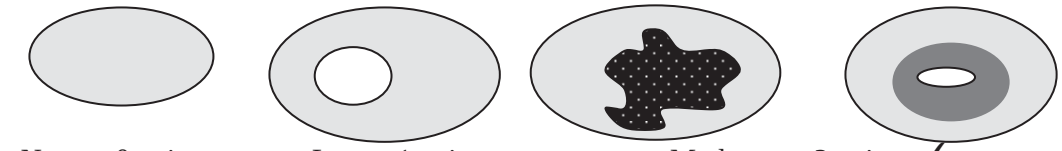
Comments

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat	**Points** (only 1 score per box)
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?	
H 1.1 <u>Categories of vegetation structure</u> ***(see p.62)***	**Figure ___**
Check the vegetation classes (as defined by Cowardin) and heights of emergents present. Size threshold for each class or height category is ¼ acre or more than 10% of the area if unit is < 2.5 acres. Aquatic bed Emergent plants 0-12 in. (0 – 30 cm) high are the highest layer and have > 30% cover ✓ Emergent plants >12 – 40 in.(>30 – 100cm) high are the highest layer with >30% cover ✓ Emergent plants > 40 in.(> 100cm) high are the highest layer with >30% cover ✓ Scrub/shrub (areas where shrubs have >30% cover) Forested (areas where trees have >30% cover) *Add the number of vegetation types that qualify. If you have:* 4-6 types points = 3 3 types points = 2 ✓ 2 types points = 1 1 type points = 0 Map of Cowardin vegetation classes and areas with different heights of emergents	2
H 1.2. Is one of the vegetation types "aquatic bed?" ***(see p .64)*** YES = 1 point ✓ NO = 0 points	0
H 1.3. <u>Surface Water</u> ***(see p.65)*** H 1.3.1 Does the unit have areas of "open" water (without herbaceous or shrub plants) over at least ¼ acre or 10% of its area during the spring (March – early June) OR in early fall (August – end of September)? *Note: answer YES for Lake-fringe wetlands* YES = 3 points & **go to H 1.4** ✓ NO = go to H 1.3.2 H 1.3.2 Does the unit have an intermittent or permanent stream within its boundaries, or along one side, over at least ¼ acre or 10% of its area, AND that has an unvegetated bottom (*answer yes only if H 1.3.1 is NO*)? YES = 3 points ✓ NO = 0 points Map showing areas of open water	**Figure ___** 0
H 1.4. <u>Richness of Plant Species</u> ***(see p. 66)*** Count the number of plant species in the wetland that cover at least 10 ft^2. (*different patches of the same species can be combined to meet the size threshold)* *You do not have to name the species.* *Do not include Eurasean Milfoil, reed canarygrass, purple loosestrife, Russian Olive, Phragmites ,Canadian Thistle, Yellow-flag Iris, and Salt Cedar (Tamarisk)* If you counted: > 9 species points = 2 4-9 species ✓ points = 1 # of species ____ < 4 species points = 0 points *List species below if you wish*	1

H 1.5. Interspersion of habitats ***(see p. 67)***

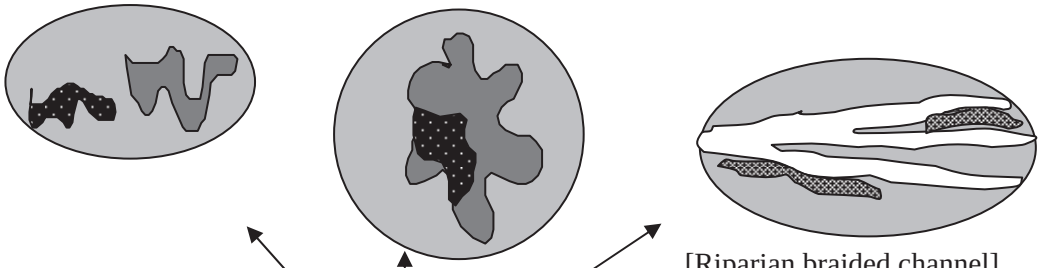
Decided from the diagrams below whether interspersion between categories of vegetation (described in H 1.1), or categories and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure ___



None = 0 points Low = 1 point Moderate = 2 points ✓

2



[Riparian braided channel]

High = 3 points

NOTE: If you have four or more vegetation categories or three vegetation categories and open water the rating is always "high". Use maps from H1.1 and H1.3

H 1.6. Special Habitat Features: ***(see p. 68)***

Check the habitat features that are present in the wetland unit. The number of checks is the number of points you put into the next column.

✓ Loose rocks larger than 4" **or** large, downed, woody debris (>4in. diameter) within the area of surface ponding or in stream.

✓ Cattails or bulrushes are present within the unit.

✓ Standing snags (diameter at the bottom > 4 inches) in the wetland unit or within 30 m (100ft) of the edge.

____ Emergent or shrub vegetation in areas that are permanently inundated/ponded. *The presence of "yellow flag" Iris is a good indicator of vegetation in areas permanently ponded.*

Stable steep banks of fine material that might be used by beaver or muskrat for denning (>45 degree slope) OR signs of recent beaver activity

Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*

Maximum score possible = 6

3

TOTAL Potential to provide habitat
Add the scores in the column above

8

Comments

H 2.0 Does the wetland have the opportunity to provide habitat for many species?	
H 2.1 Buffers ***(see p. 71)*** *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed." Relatively undisturbed also means no grazing, no landscaping, no daily human use, and no structures or paving within undisturbed part of buffer.* — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference **Points = 5** ✓ 330 ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4** — 330ft (100 m) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3** — 170ft (50 m) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3** **If buffer does not meet any of the criteria above** — No paved areas (except paved trails) or buildings within 80ft (25 m) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — No paved areas or buildings within 170ft (50m) of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2** — Heavy grazing in buffer. **Points = 1** — Vegetated buffers are <6.6ft wide (2m) for more than 95% of the circumference (e.g . tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0** — Buffer does not meet any of the criteria above. **Points = 1** Aerial photo showing buffers	**Figure ___** 4
H 2.2 Wet Corridors ***(see p. 72)*** H 2.2.1 Is the wetland unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor at least ¼ mile long with surface water or flowing water throughout most of the year (> 9 months/yr)? (*dams, heavily used gravel roads, paved roads, fields tilled to edge of stream, or pasture to edge of stream are considered breaks in the corridor*). ✓ YES = 4 points (go to H 2.3) NO = go to H 2.2.2 H 2.2.2 Is the unit part of a relatively undisturbed and unbroken, > 30 ft wide, vegetated corridor, at least ¼ mile long with water flowing seasonally, **OR** a lake-fringe wetland without a "wet" corridor, **OR** a riverine wetland without a surface channel connecting to the stream? YES = 2 points (go to H 2.3) NO go to H 2.2.3 H 2.2.3 Is the wetland within a 1/2 mile of any permanent stream, seasonal stream, or lake (*do not include man-made ditches*)? YES = 1 point NO = 0 points	4

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)*** Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections to the habitats can be disturbed.* ____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ____**Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ____ **Eastside Steppe:** Non-forested vegetation type dominated by broadleaf herbaceous flora ((*full description of herbaceous species found here are in WDFW PHS report p. 153*). ____**Old-growth/Mature forests (east of Cascade crest):** (*full descriptions in WDFW PHS report p. 157*). Old-growth: Stands are > 150 yrs in age; may be variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. Mature: Stands 80 – 160 yrs old. Decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth. ____**Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ____ **Juniper Savannah**: All juniper woodlands (*SE part of state only; check map*) ____ **Shrub-steppe**: A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover). __✓__**Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ____Inland Dunes This placeholder is for a new priority habitat that will capture areas known as Inland Dunes. A definition will be developed later in Fall 2008. *(check WDFW web site)* ____**Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ____**Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ____**Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. __✓__**Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 30 cm (12 in) in eastern Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **2 or more** Priority Habitats **= 4 points** ✓ If wetland has **1** Priority Habitat **= 2 points** No Priority habitats = **0 points** *Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*	4

H 2.4 Landscape *(choose the **one** description of the landscape around the wetland that best fits)* ***(see p. 76)***	
— The wetland unit is in an area where annual rainfall is less than 12 inches, and its water regime is not influenced by irrigation practices, dams, or water control structures. (*Generally, this means outside boundaries of reclamation areas, irrigation district, or reservoirs*) **points = 5** ✓ There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing in the connection or an open water connection along a lake shore without heavy boat traffic are OK, but connections should NOT be bisected by paved roads, fill, fields, heavy boat traffic or other development) **points = 5** — There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed? **points = 2** — There is at least 1 wetland within ½ mile**.** **points = 1** — Does not meet any of the four criteria above **points = 0**	5
H 2. TOTAL Score - opportunity for providing habitat *Add the scores in the column above*	17
H 3.0 Does the wetland unit have indicators that its ability to provide habitat is reduced?	
H 3.1 Indicator of reduced habitat functions ***(see p. 75)*** Do the areas of open water in the wetland unit have a resident population of carp (see text for indicators of the presence of carp)? *(NOTE: This question does not apply to reservoirs with water levels controlled by dams, such as the reservoirs on the Columbia and Snake Rivers)* YES = **- 5 points** NO = 0 points	*Points will be subtracted*
Total Score for Habitat Functions *– add the points for H 1, H 2, and H 3 and record the result on p. 1*	**25**

Comments

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland unit meets the attributes described below and circle the appropriate Category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All units should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	Category
SC 1.0 Vernal pools ***(see p. 79)*** Is the wetland unit **less than 4000 ft^2**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *NOTE: If you find perennial, "obligate", wetland plants the wetland is probably NOT a vernal pool* — The soil in the wetland are shallow (<1ft deep (30 cm)) and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the "wet" season. YES = Go to SC 1.1 NO - *not a vernal pool* SC 1.1 Is the vernal pool relatively undisturbed in February and March? YES = Go to SC 1.2 NO – *not a vernal pool with special characteristics*	
SC 1.2 Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 miles (other wetlands, rivers, lakes etc.)? YES = Category II NO = Category III	**Cat. II** **Cat. III**
SC 2.0 Alkali wetlands ***(see p. 81)*** Does the wetland unit meets **one** of the following two criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 - 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 2 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meets two of the following three sub-criteria? — Salt encrustations around more than 80% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 2 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. YES = Category I NO – *not an alkali wetland*	**Cat. I**

SC 3.0 Natural Heritage Wetlands ***(see p. 81)***

Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.

SC 3.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? *(this question is used to screen out most sites before you need to contact WNHP/DNR)*

S/T/R information from Appendix D or accessed from WNHP/DNR database

YES – contact WNHP/DNR (see p. 79) and go to SC 3.2 NO

SC 3.2 Has DNR identified the wetland unit as a high quality undisturbed wetland or as or as a site with state threatened, endangered, or sensitive plant species? **Cat. I**

YES = Category I NO –*not a natural heritage wetland*

SC 4.0 Bogs ***(see p. 82)***

Does the wetland unit **(or any part of the wetland unit)** meet both the criteria for soils and vegetation in bogs. *Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.*

SC 4.1. Does the wetland unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)?

Yes - go to SC 4.3 No - go to SC 4.2

SC 4.2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond??

Yes - go to SC 4.3 No - *Is not a bog for rating*

SC 4.3. Does the wetland unit have more than 70% cover of mosses at ground level in any area within its boundaries, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? **Cat. I**

Yes – Category I bog No - go to Q. 4.4

NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.

SC 4.4. Is the unit, or any part of it, forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover)?* **Cat. I**

Yes – Category I bog NO

SC 5.0 Forested Wetlands ***(see p. 85)***

Does the wetland unit have an area of forest (*you should have identified a forested class, if present, in question H 1.1*) rooted within its boundary that meet **at least one** of the following three criteria?

— The wetland is within the "100 year" floodplain of a river or stream

— aspen (*Populus tremuloides*) are a dominant or co-dominant of the "woody" vegetation. (*Dominants means it represents at least 50% of the cover of woody species, co-dominant means it represents at least 20% of the total cover of woody species*)

— There is at least ¼ acre of trees (even in wetlands smaller than 2.5 acres) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see p. 83)*

YES = go to SC 5.1 NO –*not a forested wetland with special characteristics*

SC 5.1 Does the wetland unit have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees

Slow growing trees are: western red cedar (*Thuja plicata*), Alaska yellow cedar (*Chamaecyparis nootkatensis*), pine spp. mostly "white" pine (*Pinus monticola*), western hemlock (*Tsuga heterophylla*), Englemann spruce (*Picea engelmannii*).

YES = Category I NO = go to SC 5.2 **Cat. I**

SC 5.2 Does the unit have areas where aspen (*Populus tremuloides*) are a dominant or co-dominant species?

YES = Category I NO = go to SC 5.3 **Cat. I**

SC 5.3 Does the wetland unit have areas with a forest canopy where more than 50% of the tree species (by cover) are fast growing species.

Fast growing species are:
Alders – red (*Alnus rubra*), thin-leaf (*A. tenuifolia*)
Cottonwoods – narrow-leaf (*Populus angustifolia*), black (*P. balsamifera*)
Willows- peach-leaf (*Salix amygdaloides*), Sitka (*S. sitchensis*), Pacific (*S. lasiandra*), Aspen - *(Populus tremuloides*), Water Birch (*Betula occidentalis*)

YES = Category II NO = go to SC 5.5 **Cat. II**

SC 5.5 Is the forested component of the wetland within the "100 year floodplain" of a river or stream?

YES = Category II **Cat. II**

Category of wetland based on Special Characteristics

Choose the "highest" rating if wetland falls into several categories.
If you answered NO for all types enter "Not Applicable" on p.1

BONNEVILLE POWER ADMINISTRATION
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