Bonneville Power Administration

Klickitat Hatchery Spring Chinook Upgrades
Draft Environmental Assessment

BPA-22-1-78975-004
DOE/EA-2207
March 24, 2023

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PREPARED FOR

Bonneville Power Administration
Portland, Oregon

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
Accords	2008 Columbia Basin Fish Accords Memorandum of Agreement
ADA	Americans with Disabilities Act
BMP	Best Management Practice
BPA	Bonneville Power Administration
CEQ	Council on Environmental Quality
cfs	cubic feet per second
Council	Northwest Power and Conservation Council
CR	Columbia River
CRITFC	Columbia River Inter-Tribal Fish Commission
CRS	Columbia River System
CWA	Clean Water Act
DOE	United States Department of Energy
EA	Environmental Assessment
Ecology	Washington Department of Ecology
EFH	Essential Fish Habitat
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FARR	Federal Air Rules for Indian Reservations
FCRPS	Federal Columbia River Power System
fpp	Fish per pound
GHG	Greenhouse Gas
gpm	Gallons per minute
HGMP	Hatchery and Genetic Management Plan
HSRG	Hatchery Scientific Review Group
MCR	Middle Columbia River
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOR	Natural-Origin
Northwest Power Act	Pacific Northwest Electric Power Planning and Conservation Act of 1980

Acronyms/Abbreviations	Definition
NPDES	National Pollution Discharge and Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NTU	Nephelometric Turbidity Units
O&M	Operations and Maintenance
OHWM	Ordinary High Water Mark
pHOS	Proportion of hatchery origin spawners
PIT	Passive Integrated Transponder
PNI	Proportion of natural influence
pNOB	Proportion of natural origin broodstock
Program	Columbia River Basin Fish and Wildlife Program
RM	River Mile
SCADA	Supervisory Control and Data Acquisition
SEPA	Washington State Environmental Policy Act
Services	United States Fish and Wildlife Service and National Marine Fisheries Service
SPCCP	Spill Prevention, Containment, and Control Plan
SWIFD	Statewide Washington Integrated Fish Distribution
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WNHP	Washington Natural Heritage Program
Yakama Nation	The Confederated Tribes and Bands of the Yakama Nation
YKFP	Yakima/Klickitat Fisheries Project

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

The Bonneville Power Administration (BPA) proposes to fund upgrades to the Klickitat Hatchery in the Klickitat River Basin in Klickitat County, Washington in partnership with the Confederated Tribes and Bands of the Yakama Nation (Yakama Nation). The proposal includes funding capital improvements to the Klickitat Hatchery facilities to support an increase in spring Chinook salmon production and a transition from a segregated to an integrated spring Chinook program. BPA is also considering optional components that would create additional housing for hatchery staff and their families. This environmental assessment (EA) intends to fulfill the requirements of the National Environmental Policy Act (NEPA) by examining the environmental impacts of the Proposed Action and the No Action alternatives.

1.2 BACKGROUND

1.2.1 Northwest Power and Conservation Council Program

BPA is a federal power marketing agency within the United States Department of Energy (DOE). BPA's actions are governed by several statutes, including the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. §§ 839 *et seq*.). Under the Northwest Power Act, BPA must protect, mitigate, and enhance fish and wildlife affected by the development and operation of the Federal Columbia River Power System (FCRPS) on the Columbia River and its tributaries in a manner consistent with the Northwest Power and Conservation Council's (Council) Columbia River Basin Fish and Wildlife Program (Program).

The proposed Klickitat Hatchery capital improvements analyzed in this EA comprise the project that the Council has identified for potential BPA funding. The Council has a three-step process for review of artificial propagation projects (i.e., hatcheries) proposed for BPA funding to ensure scope, intent, and cost estimates remain consistent with Program objectives. Step 1 is conceptual planning, represented primarily by master plan development. Step 2 is preliminary design and cost estimates along with environmental review (e.g., the NEPA process and other environmental compliance). Step 3 is final design review and construction. The Council's Independent Scientific Review Panel reviews proposed projects as they move between steps, and the Council makes recommendations for projects to move forward through the steps (i.e., from Step 1 to Step 2, or from Step 2 to Step 3).

The most recent iteration of the Klickitat River Spring Chinook Master Plan (Step 1), submitted to the Council in January 2018, focused on capital improvements needed at the Klickitat Hatchery to facilitate the transition from a segregated spring Chinook production program to an integrated program. This EA addresses the environmental review portion of Step 2 of the Council's three-step process.

The spring Chinook program's operations and maintenance (O&M) are funded by the National Marine Fisheries Service (NMFS) under the Mitchell Act of 1938, 16 USC 755 -757, and the hatchery is co-

managed by the Yakama Nation and the Washington Department of Fish and Wildlife (WDFW). BPA funds portions of the Yakima/Klickitat Fisheries Project (YKFP), which supports at-risk fish species within the Klickitat River basin through actions such as research, monitoring, evaluation, data management, fish passage facility O&M, and habitat restoration projects. BPA does not fund Klickitat Hatchery O&M.

1.2.2 Columbia Basin Fish Accords

On May 2, 2008, BPA, the Bureau of Reclamation, and the U.S. Army Corps of Engineers (USACE) signed the 2008 Columbia Basin Fish Accords Memorandum of Agreement (Accords) with three lower Columbia River Treaty Tribes: Yakama Nation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes of the Umatilla Indian Reservation, along with the Columbia River Inter-Tribal Fish Commission (BPA et al. 2008). The Accords included a broad suite of federal commitments for fish and wildlife mitigation actions. Specifically, BPA committed to providing capital funds for upgrading the Klickitat Hatchery as part of the Accords. BPA funding commitments do not relieve Accords projects from Council project review and recommendation processes as described in Section 1.2.1, or from applicable laws, including NEPA and the Endangered Species Act (ESA).

1.2.3 Columbia River Hatchery Scientific Review Group

The Hatchery Scientific Review Group (HSRG), a 14-member independent panel, was charged by Congress in 2005 with reviewing all state, tribal, and federal hatchery programs in the Columbia River Basin as part of a comprehensive hatchery reform effort to:

- Conserve indigenous salmonid genetic resources.
- Assist with the recovery of naturally spawning salmonid populations.
- Provide sustainable fisheries.
- Improve the quality of hatchery programs.

In February 2009, the HSRG published its final system-wide report (HSRG 2009). The report recommended that hatchery programs rely on comprehensive monitoring and evaluation to determine how management changes can address factors influencing fisheries. The principles underlying hatchery reform for an integrated conservation approach direct the operation and management of hatchery facilities to achieve proper genetic integration with natural-origin fish. The HSRG also made specific recommendations for changes to the spring Chinook program in the Klickitat River basin. Those recommendations include:

- Incorporating a lower river broodstock collection facility to achieve the objective of increasing the percentage of natural-origin broodstock;
- Improving survival by reducing rearing densities, exploring alternative water sources during rearing, and addressing disease issues; and

- Releasing 800,000 spring Chinook smolts to achieve a 30 percent proportion of natural-origin broodstock (pNOB) and a 14 percent proportion of hatchery origin spawners (pHOS) to result in a 0.69 proportion of natural influence (PNI).

The HSRG recommendations are not requirements, but inform how reform could be accomplished. The Yakama Nation has incorporated the recommendations from the HSRG in its proposed spring Chinook program as described in the Klickitat River Spring Chinook Hatchery and Genetic Management Plan (Yakama Nation 2019).

1.2.4 Klickitat River Spring Chinook Hatchery and Genetic Management Plan

The Klickitat Spring Chinook Hatchery and Genetic Management Plan (HGMP) is a technical document that describes the composition and operation of the spring Chinook program (Yakama Nation 2018). The HGMP assists NMFS in evaluating impacts of the hatchery program on listed species and guides fish production and management planning by other federal, state, and tribal resource managers.

The most recent Klickitat Spring Chinook Production Program HGMP, updated February 2019, describes how the existing segregated harvest program, in which hatchery-raised fish are managed as genetically distinct from naturally spawning populations, could be converted to an integrated program in which hatchery and natural-origin fish are managed as one population and natural selection drives the fitness of the population as a whole (Yakama Nation 2019). The rate at which the program could transition would depend on the size of the spring Chinook run, which can vary from year to year. To achieve both conservation and harvest objectives, the plan estimates that the hatchery program would need to maintain an annual release of approximately 800,000 yearling spring Chinook.

1.3 COOPERATING AGENCIES

When a project involves more than one federal agency, federally-recognized tribal government, or state agency, those entities often work together during the planning and decision-making process. As one of the proposed funding agencies, BPA is the lead federal agency for this action and is supervising the preparation of the EA. Yakama Nation and WDFW are cooperating agencies and are assisting BPA with preparation of the EA. Each of the agencies involved will consider the information in the EA, public comments, and its own expertise related to the project in making their respective decisions.

1.3.1 Bonneville Power Administration Decisions

BPA must decide whether to fund the proposed upgrades. BPA's decision will be informed by whether the Proposed Action meets BPA's purpose and need, by the potential environmental impacts of the Proposed Action, and by comments and expertise of the public and the cooperating agencies participating in development and review of the EA.

1.3.2 Yakama Nation Decisions

The Yakama Nation is a cooperating agency and is the operator of the hatchery. The Yakama Nation will decide whether the potential environmental impacts of the proposed Klickitat Hatchery Upgrades

Project are consistent with the Yakama Nation's resource management objectives in the Klickitat River basin and other treaty and trust obligations.

1.3.3 Washington Department of Fish and Wildlife Decisions

WDFW is a cooperating agency and the lead state agency for the SEPA (Washington State Environmental Policy Act) process that applies to the Proposed Action. The SEPA process is described in Chapter 4. As co-manager of fishery resources in the Klickitat River basin, WDFW must also consider the proposed changes to the hatchery and the potential environmental impacts of those changes.

1.4 NEED

1.4.1 Bonneville Power Administration

BPA needs to respond to the Council's recommendation to implement the Klickitat River Spring Chinook Master Plan and decide whether to provide funding to the Yakama Nation for its proposal to upgrade Klickitat Hatchery facilities. The upgrades are needed to convert the existing segregated program to an integrated program that incorporates natural-origin fish in the broodstock and also increase spring Chinook production from 600,000 to 800,000 yearling smolts.

1.4.2 Yakama Nation

The Yakama Nation People are Salmon People. They have taken a solemn vow with the "Creator" to protect and speak for those that cannot speak for themselves. Spring Chinook are an important first food that serves an important ceremonial need. Robust fish runs allow for subsistence and commercial harvest that provide important opportunities to continue to practice the Yakama Nation's rights established under the Treaty of 1855. This project would aid the Yakama Nation in their efforts to restore fish runs to abundant levels while also increasing natural production in the Klickitat Basin.

1.4.3 Washington Department of Fish and Wildlife

WDFW is performing environmental review under SEPA as the project landowner. WDFW will review this EA and make a threshold determination to meet its statutory requirements under SEPA. WDFW has a long-established contractual relationship with the Yakama Nation regarding this facility and is supportive of project goals to upgrade infrastructure to allow for increased production and transition to an integrated hatchery program.

1.5 PURPOSE

To meet the underlying need, the Proposed Action considered in this environmental analysis should achieve the purposes described in the following sections.

1.5.1 Bonneville Power Administration

BPA decision-makers will consider how well the Proposed Action meets these purposes when making a decision:

- Support efforts to mitigate effects of the development and operation of the FCRPS on fish and wildlife in the mainstem Columbia River and its tributaries under the Northwest Power Act (16 U.S.C. § 839b(h)(10)(A)).
- Assist in carrying out commitments related to proposed hatchery actions that originated in the Accords and that were reaffirmed in the subsequent amendments to the Columbia River Fish Accord Extension Agreement with the Yakama Nation and others.
- Improve hatchery infrastructure needed to support spring Chinook populations in the Klickitat River basin for conservation and long-term harvest opportunities.

1.5.2 Yakama Nation

Through this project and others in the YKFP, the Tribe's purpose is to collect data that informs decision-making and implement management actions using federal and state mitigation funds. This project is intended to provide increased natural production in the Klickitat Basin and aid the Yakama Nation in their harvest objectives.

1.5.3 Washington Department of Fish and Wildlife

WDFW objectives to be evaluated for the Proposed Action include:

- Improve hatchery infrastructure needed to support spring Chinook populations in the Klickitat River basin for conservation and long-term harvest opportunities.
- Create conditions that allow for the continual adaptive management of Klickitat River salmon stocks consistent with the Yakima Klickitat Fisheries Project co-management framework.

1.6 PUBLIC INVOLVEMENT

On August 12, 2022, BPA announced a 30-day scoping period on the Yakama Nation's proposal for upgrades to the Klickitat Hatchery. Public comments were taken from August 12 through September 12, 2022; two written comments were received.

One commenter stated the Proposed Action was supportive of commitments outlined in the Columbia Basin Fish Accords and Northwest Power Act and was also supportive of tribal treaty fishing rights. Another commenter questioned the benefits of an integrated hatchery program on naturally spawning populations compared to the current segregated program and also stated that using BPA ratepayer funds for the Proposed Action would violate "in lieu" provisions of the Northwest Power Act. The effects of the Proposed Action on fish are discussed in Section 3.3 of this EA. The anticipated effects of an integrated hatchery program are described and evaluated in the 2018 Klickitat Spring Chinook Production Program Master Plan and subsequent update in 2019 (Yakama Nation 2018; Yakama Nation 2019). BPA is not proposing to fund any fish production or to take over any Mitchell Act funding for the hatchery. The two scoping comments can be found in Appendix A.

On February 24, 2023, BPA published a Federal Register notice terminating the previous EIS process and providing details on BPA's intent to prepare an EA. The Draft EA is available for public comment for 30 days from April 10 to May 9, 2023. A web-based public meeting will be held on April 25, 2023.

The Final EA will be revised as necessary based on the public comments received.

2.0 PROPOSED ACTION AND ALTERNATIVES

BPA proposes to fund capital improvements to the existing Klickitat Hatchery facilities in the Klickitat River Basin that would be constructed by BPA on behalf of the Yakama Nation to meet the purpose and need for action described in Chapter 1. This chapter evaluates two alternatives: the No Action Alternative and the Proposed Action Alternative. This is consistent with Council on Environmental Quality (CEQ), and DOE NEPA implementing regulations for EAs (10 Code of Federal Regulations § 1021.321(c)), which only require analysis of a No Action Alternative and a Proposed Action Alternative. Descriptions of facility development and construction under each alternative are detailed in the following sections. Improvements to production facilities necessary to meet the Proposed Action's purpose and need, including fulfilling Accord commitments and addressing, in part, BPA's responsibilities under the Northwest Power Act, are specifically evaluated. Funding for O&M would continue to be provided through NMFS' Mitchell Act responsibilities, and therefore not part of BPA's decision to be made.

This chapter also includes tables evaluating the alternatives against the purposes and comparing the alternatives with their expected environmental impacts.

2.1 NO ACTION ALTERNATIVE

Consideration of the No Action Alternative is required by NEPA (40 CFR § 1502.14(c)). Typically, the No Action Alternative is defined as the continuation of current management. This section describes the existing spring Chinook production program at the Klickitat Hatchery. Under the No Action Alternative, the existing conditions and actions described in this section are assumed to continue for the foreseeable future (i.e., for at least the next 20 years for this analysis). This discussion and the subsequent environmental analyses are intended to "provide a benchmark, enabling decision makers to compare the magnitude of the environmental effects of the action alternatives." (CEQ 1986).

2.1.1 Klickitat Hatchery

The Klickitat Hatchery is located 7 miles east of Glenwood, Washington, at River Mile (RM) 42 of the Klickitat River (Figure 2-1). The Klickitat Hatchery complex covers approximately half of a 167-acre parcel (approximately 83 acres of developed land). The existing facilities include a number of structures used for hatchery operations (Appendix B). The main hatchery building (6,853 square feet) is located near the center of the complex and houses the primary hatchery room, feed room, office and personnel space, and a storage loft. Three residence buildings are located on the south side of the complex for hatchery personnel and their families. Averaging 1,054 square feet each, the residences are one-story wood frame houses with an attached one-car garage built in the early 1950s. Other buildings on site include a generator building, freezer building, energy building, and various vehicle and supply sheds. None of the existing facilities are accessible relative to the Americans with Disabilities Act (ADA), and most have not been renovated since the complex was originally developed in 1954.

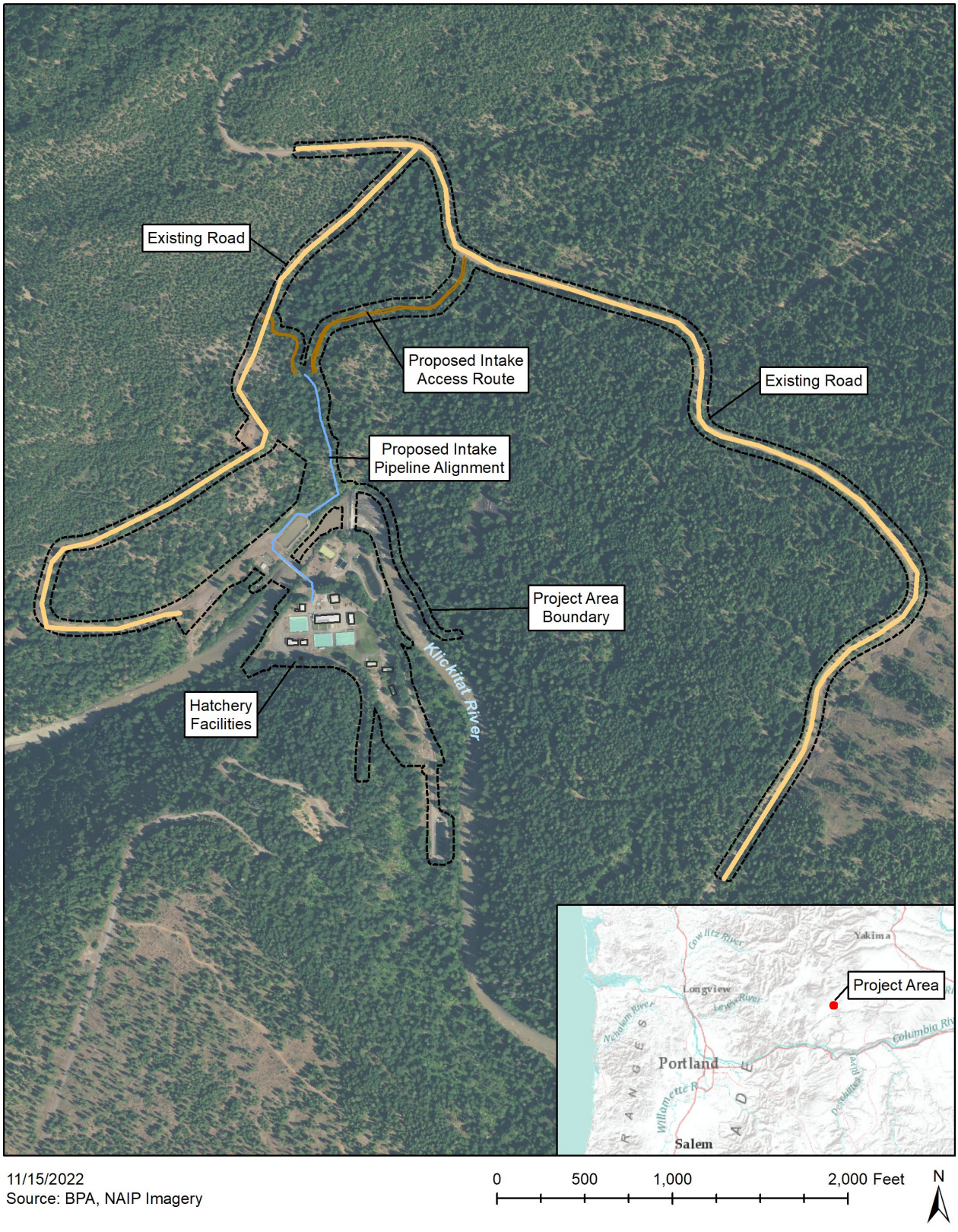


Figure 2-1. Project Area

Domestic water for the residences and office is supplied from a spring surface water source (Indian Ford A Spring). Water is then chlorinated and filtered into a 1,000-gallon storage tank near the energy dissipation building. This tank contains a pressurized system that supplies the three residences and office. Sewage for the complex is conveyed to one of four 500-gallon septic tanks (one for each house and one for the office restrooms).

Twenty-two hatchery raceways, each approximately 130 feet long, are located along the south and west side of the main hatchery building. In addition, there are three rearing ponds, three circular tanks, an adult holding pond, and a pollution abatement pond located throughout the complex. The raceways and rearing ponds receive their water from a combination of two Indian Ford A Spring water intakes.

The Klickitat Hatchery is located within the Yakama Nation Reservation and has access points on either side of the river. The main access point from the south is about 6 miles east of Glenwood, Washington, with an additional access point to the north. A single lane bridge spans the Klickitat River. The bridge allows for servicing facilities on the north side of the river, access to the main complex, and emergency egress.

2.1.2 Fish Production Program

Four segregated harvest fish programs are currently supported by operations at the Klickitat Hatchery. A segregated harvest program involves propagation of fish as genetically separate or segregated populations relative to naturally spawning populations (HSRG 2009). The intent of a segregated program is to create a hatchery-adapted population to meet goals for harvest. In a segregated program, the intent is for hatchery fish populations to be maintained primarily or exclusively from adults returning to the hatchery, with little to no interaction with the naturally spawning population.

Under the No Action Alternative, a total of 600,000 spring Chinook would continue to be propagated and released annually at the Klickitat Hatchery to provide fish for tribal and non-tribal fisheries. Currently those fish are volitionally released (i.e., voluntarily swimming out on their own) as smolts. Under this alternative, the program would remain segregated and at current production levels.

2.2 PROPOSED ACTION

The Proposed Action is to implement the hatchery and production portion of the Klickitat River Spring Chinook Plan (Yakama Nation 2019), developed by the Yakama Nation in cooperation with WDFW. The Proposed Action includes construction and upgrades to the Klickitat Hatchery that would allow for the successful holding and spawning of adult Chinook salmon and the rearing and annual release of up to 800,000 spring Chinook yearling smolts at a 15-20 fish per pound (fpp) size.

The Proposed Action would result in an integrated hatchery and harvest program for spring Chinook. An integrated program is one designed to “increase abundance, while minimizing the genetic divergence of a hatchery broodstock from a naturally spawning population” (HSRG 2009). The intent is to produce hatchery fish more genetically similar to naturally-spawning fish.

2.2.1 Fish Production Program

The segregated harvest program would be converted to an integrated conservation/harvest program by incorporating an increasing proportion of natural-origin (NOR) Klickitat River spring Chinook into the broodstock. The goal would be to end the current segregated hatchery genetic line once a sufficient number of integrated program and NOR adults are available as broodstock to support production goals. The program would be designed to meet conservation needs by increasing the viability of the natural population while simultaneously producing the adults needed to meet harvest objectives. To achieve both conservation and harvest objectives, it is estimated that the hatchery program would maintain an annual release number of approximately 800,000 yearling spring Chinook. Broodstock would be collected from fishways at the Lyle Falls (RM 2.0 on the Klickitat River) and Castile Falls facilities (RM 64 in the upper Klickitat River gorge). Some of the adults derived from natural-origin broodstock returning to Lyle Falls, Castile Falls, or the hatchery would be transported and released above Castile Falls to seed the upper Basin. For the first 5 years of returns, the number of these adults transported and released above Castile Falls would not be restricted. If natural escapement levels increase over time, hatchery releases of adults into the upper Basin would be reduced to ensure that the natural environment, rather than the hatchery, drives local adaptation (HSRG 2009).

2.2.2 Facility Upgrades

Facility development and construction would take place at the Klickitat Hatchery. Figure 2-2 and Figure 2-3 display the main components of the proposed upgrades. Full design plans for the project can be found in Appendix B. Construction of temporary rearing facilities and connection of the new upper Indian Ford A Spring water supply pipeline is expected to take place in the fall and winter (September through January) during low water-use periods at the hatchery. The Indian Ford A Spring system is not a fish-bearing stream, and there would be no net addition of fill or structures in the 100-year floodplain. After the temporary facilities are online, construction of the new structures would take place throughout the following year while hatchery operations continue, though any in-water work would be restricted to the upper intake at Indian Ford A Spring. The proposed facility development and construction are described in the following sections.

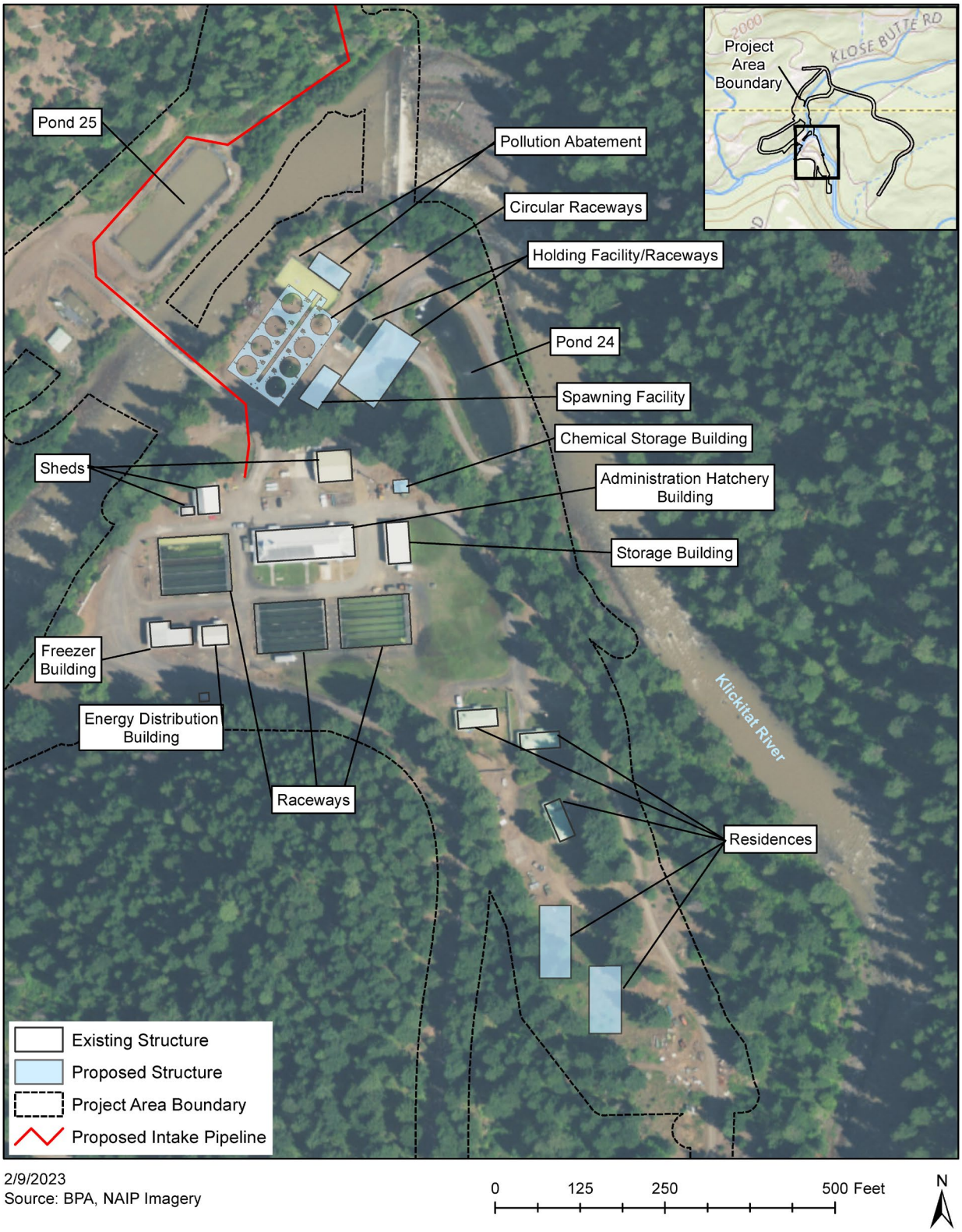


Figure 2-2. Proposed Action: Hatchery Upgrades Construction Details

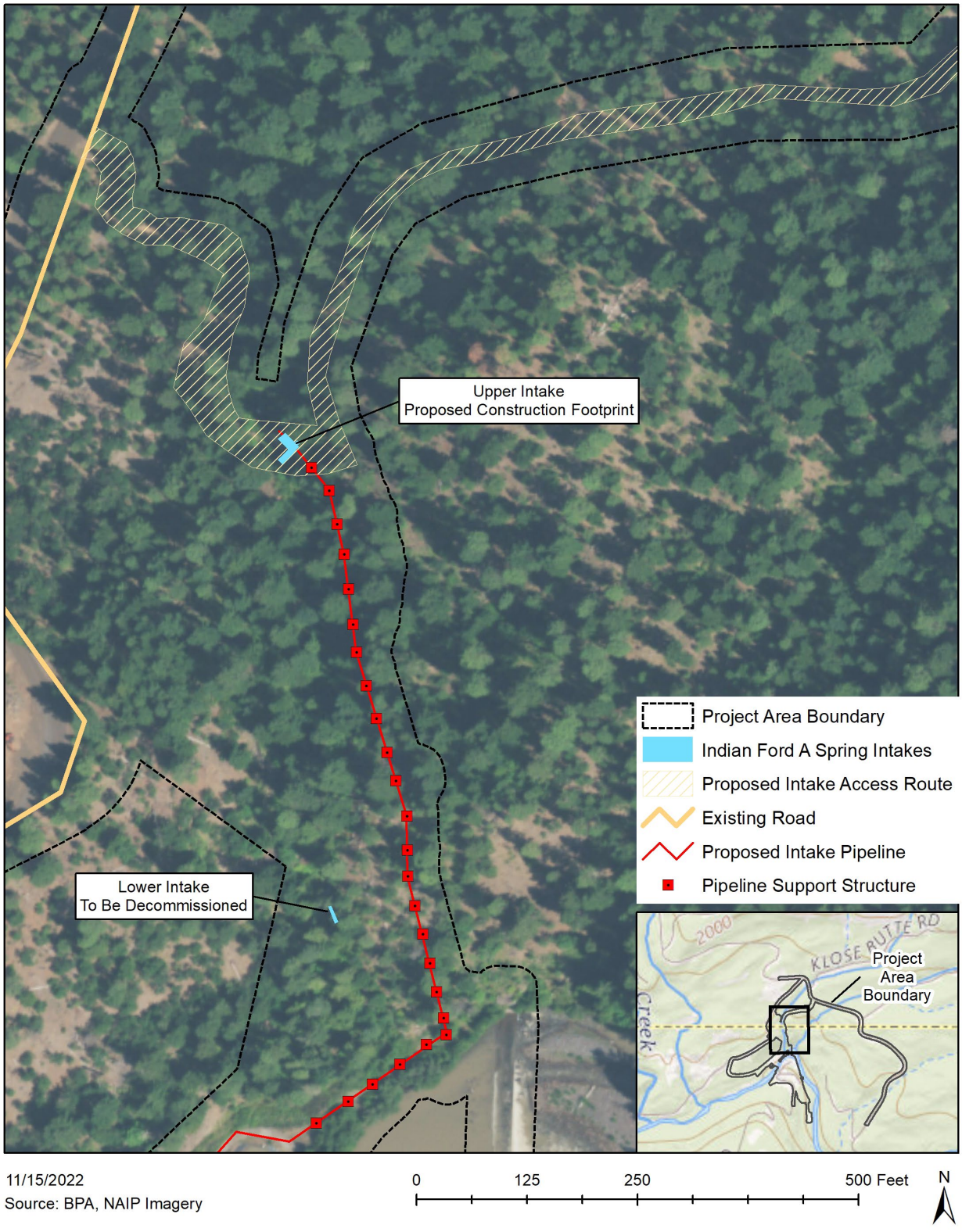


Figure 2-3. Proposed Action: Indian Ford A Spring Construction Details

2.2.2.1 Staging, Site Preparation, Demolition

The areas of potential disturbance include 16 acres located along the southeast side of the river and 4 acres along the northwest side. Some existing structures would be demolished or remodeled to meet current building codes and allow for better organization and use of space. These structures include underground utilities and drains, adult holding facilities, the pollution abatement pond and direct drive mixers, influent and outlet piping at the Pond 24 rearing pond, and a portion of the interior of the administration building. Pond 24 would be used during construction as temporary spring Chinook adult holding and temporary pollution abatement. Depending on the construction schedule, temporary adult holding and rearing facilities may be constructed to provide uninterrupted operations for the other programs at the hatchery. Site work southeast of the river would include extending gravel roads to the acclimation ponds, as well as grading and landscaping. Gravel roadways 25 feet wide would be provided around the new facilities to support a circular traffic pattern through the area. The site would be graded to allow the finished floor of new buildings to be constructed at least 1 foot above the site's 100-year flood elevation. All excavation would be accomplished with conventional tracked and wheeled equipment, including excavators, loaders, and dozers.

On-site temporary staging areas would be located in areas that are already disturbed and free of native vegetation. Equipment would also be staged in previously disturbed areas of the main hatchery complex near each construction site, away from public parking. Heavy equipment would be brought in on trailers using the existing main access road from Fish Hatchery Road, as well as via an existing route from the north. Fences, warning signs, barricades and other devices would be installed around the construction area for construction and hatchery personnel safety. Construction activities would occur year-round during all suitable months, and all work would take place above the ordinary high water mark (OHWM) of the Klickitat River. In-water work would be limited to the upper intake at Indian Ford A Spring.

2.2.2.2 Indian Ford A Spring Intake and Pipeline

Indian Ford A Spring is the primary water source used by the Klickitat Hatchery. The upper intake currently captures 7.6 cubic feet per second (cfs) of the possible 15.5 cfs produced by the spring. Water is also captured downstream at the Indian Ford A Spring lower intake at a rate of 5.7 cfs. The hatchery currently does not capture its full water right for these points of diversion, which are for a maximum of 15 cfs and 12 cfs, respectively. Water from Indian Ford A Spring is used to supply raceway banks A, B, and C in addition to Pond 24. Under the Proposed Action, this water source would also supply the distribution box at the hatchery and then be routed to the adult holding facility or the new circular raceways.

The upper intake is a concrete diversion originally constructed in 1949, then modified in 1973. Water level is controlled by a series of wood stoplogs and slide gates mounted on the upstream side of the structure. Along the left abutment, a weir collects water through a set of horizontal wedge wire screens. The outlet of the weir feeds a 19-inch-diameter welded steel above-ground pipeline that conveys spring water approximately 2,000 feet to the energy dissipation building at the hatchery.

During construction, this pipeline would need to continue supplying water to the hatchery until a new system is operational.

Phase 1 of construction would involve placing a supersack cofferdam to divert all of the water from the Indian Ford A Spring to the weir, allowing for the continual supply of water to the hatchery while simultaneously dewatering the right side of the structure. While the right side is dewatered, it would be rehabilitated and retrofitted with a temporary collection box to supply water to the hatchery during Phase 2. A pipe from the temporary collection box would tie into the existing pipeline to continue supplying water to the hatchery while the spring box is dewatered. New unseating head slide gates would also be installed along the structure to control water level behind the intake. These gates could also be used to release water into the channel downstream of the intake during times when less water is needed at the hatchery.

During Phase 2 of work on the spring, the water for the hatchery would be supplied from the newly rehabilitated right side of the structure, and a cofferdam would dewater the left side of the diversion. The existing weir would be demolished and replaced with a new concrete collection box and screen tied into the existing structure. Similar to Phase 1, a new concrete wall would be cast downstream of the existing structure. Walkways would be installed along each side of the spring for maintenance access. At the southern end of the collection box, an overflow weir would be cast into the wall to allow maintenance staff to pass debris off the new horizontal wedge wire screens to the channel below. A new 24-inch-diameter welded steel pipeline would be routed above-ground, parallel to the existing 19-inch pipeline, from the downstream face of the new collection box, across the bridge that spans the Klickitat River and to the existing energy dissipation building at the hatchery. Upon completion of Phase 2 and the new 24-inch-diameter pipeline, the existing 19-inch pipeline would be capped and left in place.

The water diversion is currently accessed on foot via an unimproved access route to the east of the structure that was likely used at the time the diversion was first installed. This access route has not been maintained and would need light grading and vegetation removal of small (less than 6-inch diameter) trees and brush to allow access of an excavator, concrete trucks, and smaller equipment, such as a skid steer and hand tools that may be needed to conduct the water diversion repairs and new pipeline installation. Because the transition to spring water would need to take place during the low water usage periods at the hatchery, much of the work would be completed in the fall and winter. Some gravel may be needed to stabilize the roadway and prevent transporting mud, dirt, or surface vegetation outside of the worksite. Best management practices would be used adjacent to the Indian Ford A Spring waterway to control stormwater including straw wattles and silt fences, as needed.

2.2.2.3 Surface Water Pump Station

As part of a pilot study completed in 1990, BPA funded the installation of a new river intake and pump station along the right bank of the Klickitat River. The facility included three pump and tee screen assemblies supported by a steel frame. The pump assemblies are raised or lowered into the river via hand winches. The Proposed Action includes rehabilitation of the pump station, beginning with sandblasting and recoating the steel superstructure, and followed by replacing electrical and

mechanical parts in-kind. All work would occur when the pump assemblies are raised out of the water, allowing the work to occur in the dry.

2.2.2.4 Distribution Box

All water used in the hatchery facility (both river and spring water, single pass and recycled water) would be routed directly to a new aeration tower located near the adult holding ponds. The aeration tower would remove dissolved nitrogen from the water and increase dissolved oxygen to near saturation levels. Once water is degassed and aerated, the water would be held at fixed elevations in the distribution box and distributed as needed to the circular tanks and adult holding raceways by a series of slide gates and butterfly valves. The distribution box would be cast-in-place concrete, covering approximately 30 square feet, with a wall height of approximately 15 feet. The internal water depth would be approximately 12 feet.

2.2.2.5 Fishway

The hatchery fishway was originally constructed in 1952 and discharges into the south bank of the Klickitat River. The fishway is an approximately 6-foot wide by 8.5-foot tall by 90-foot long concrete channel with a series of seven weirs constructed of wood. Water travels over the weirs through a series of notches, alternating left and right from one weir to the next. At the entrance, there is an additional weir that is approximately 2 feet tall and a stop gate to prevent fish from accessing the fish ladder outside of the capture period.

The fishway is in good overall condition and would continue to be used after repairs to the existing concrete structure and replacement of deteriorated materials. The trapping area and adult holding facilities would be demolished, and the upstream end of the fishway would be modified to tie into the new facilities allowing fish to enter the new adult holding raceways directly without any additional handling. New structural grating would be set along the top of the structure and new concrete would be cast to fill in existing cutouts at the bend of the fishway after first using the cutouts to access the area to install an upwell.

The fishway serves as one of the discharge points for water leaving the hatchery to provide both scent and attraction flow needed to lure adult Chinook to existing adult holding raceways where they remain until spawning operations begin. In the proposed design, an additional 4,600 gallons per minute (gpm) (above the existing 1,400 gpm) would be directed to the fishway, necessitating modification to the weir system to dissipate the energy created by the additional flows and allow fish to pass up the fishway. Currently, there are seven weirs in the fishway. Five additional weirs would be added to the upstream portion of the fishway. Each weir would be built up using two-by-four wooden stoplogs and set in structure using the existing slots.

2.2.2.6 Adult Holding and Spawning Facilities

The adult holding facility would include two raceways, a cross crowder channel, and a fish supply channel. Each raceway would be 12 feet wide, 10 feet deep, and 66 feet long, and sized to hold up to 400 adult spring Chinook. Water would upwell into the raceways from the south through a screened inlet in the floor. At the opposing end, a rotating standpipe located downstream of a floor screen

would provide independent water level control for each raceway. Fish would primarily enter the raceways volitionally via the fishway/fish supply channel. A finger weir and vee trap would be used in the fishway and adult holding raceways to deter fish from leaving once they enter the ponds. Passive Integrated Transponder (PIT) tag detection would also be provided in the fishway with antennae installed upstream and downstream of the vee trap.

The spawning facility would be 47 feet by 29 feet and would use a slab footing with a stem wall and wood framing. The spawning facility would be used to handle all incoming fish and to sort fish that are being held in the raceways for spawning and distribution. Fish not ready for spawning would be returned to the raceways via transfer pipes.

2.2.2.7 Chiller Monitoring and Alarm System

Yakama Nation previously installed a chiller system to support egg incubation and modulate early-rearing growth rates by cooling spring water piped into the incubation building. The chiller system is largely complete but lacks full electrical equipment, alarm, and monitoring instrumentation. The chiller system is sized to cool supplied water from 49°F to 39°F and to provide 90 to 250 gallons of water per minute. Once installed, the system could operate up to six months each year during spring Chinook incubation and early rearing.

The remaining electrical components would be installed within the existing chiller unit and would include performance displays and automated alarm signals to indicate the chiller is performing outside of fish culture parameters. As part of the Proposed Action, BPA would fund the completion of the electrical components of the chiller system and its connection to the main facility's instrumentation panel. No additional infrastructure would be needed to install this instrumentation.

2.2.2.8 Circular Raceways

Eight new 30-foot-diameter circular raceways would be constructed at the northern end of the hatchery designed to meet the space and flow requirements for the rearing of spring Chinook. Fish would be transferred to the raceways via existing piping. A new 6-inch water supply pipe would be installed from the existing transfer box and extend below grade through the access road before daylighting near the circular raceways. The circular raceways would primarily use Indian Ford A Spring water that remains at approximately 50°F year-round, but would also be fed by serial reuse water during the spring and early summer.

Each circular raceway would include a single outlet box along one side of the tank that is split between the sump and skimmer drains. The sump drain side of the box would be fed via a floor drain located in the center of each tank, while the skimmer drain would drain water off the top of the tank via a screen in the side of the tank. Flow split between these drains would be controlled through an adjustable weir and set of orifices within the sump standpipe. Waste would be flushed from the tanks with a rotating sump standpipe. The drainage piping would use a utility trench for sump discharge and a closed conduit for skimmer discharge.

Each tank would be partially buried with final heights at 32 inches above grade to allow for easy maintenance and access to the tanks without the need for catwalks or additional structural supports. An air lift pump (also known as AeroBoost) would be provided at each circular tank to provide an additional level of biosecurity to prevent disease outbreaks. Dissolved oxygen and temperature would be monitored at each circular tank and reported through the hatchery's Supervisory Control and Data Acquisition (SCADA) system to remotely monitor key fish health parameters.

The new circular raceways would be covered with a pre-engineered metal roof structure approximately 150 feet by 90 feet with open sides to deter predators and pathogen vectors from the raceways.

Spring Chinook yearlings would be volitionally released from the circular raceways to the Klickitat River by pulling the side box screen, allowing fish to pass over the control weir and enter the 18-inch-diameter skimmer flow drainpipe within the floor trench. Most of the water from this drain would pass through a screen for discharge to the fishway, but some would pass through an 18-inch-diameter transfer pipe that outlets directly to the river. Any fish remaining in the tank after a period of volitional release could also be forced to the river by flushing the tanks.

2.2.2.9 Effluent Treatment

A new effluent treatment system would serve both the existing upper hatchery (raceway banks A, B, and C, and incubation) and the eight new circular raceways. It would handle the waste streams from the existing facilities in the same way they are currently handled.

Hatchery Building/Incubation: The incubation flows from the hatchery building would be discharged to the same collection system as the raceways and directed to the lower site for serial reuse or direct discharge back to the river. The incubation flows consist of clean effluent that may be directly discharged to the river without treatment. This process is similar to what is done across most Pacific Northwest hatcheries and is typically permitted because the salmon eggs are not fed, and each incubation tray discharge is screened. This produces a relatively clean flow stream that is suitable for discharge or serial reuse without treatment.

Existing Raceway Banks: Raceway banks A, B, and C use a vacuum system for solids removal. The operation of this system involves vacuuming each bank of raceways on an average of once every three weeks. The vacuumed waste is discharged to the vacuum waste line and routed to the pollution abatement pond. The overflow from the raceways is collected and piped to the lower site for serial reuse; since solids are settled out from the flow within the raceways, it is considered clean and any flow that is not used for serial reuse is discharged back to the river without treatment. Under the Proposed Action, raceway banks A, B, and C flows would be piped to the lower site and provide serial reuse water supply to the adult holding facilities and the circular tanks. The vacuum waste from raceway banks A, B, and C would be piped to new pollution abatement ponds for treatment.

Proposed Adult Holding Ponds: Adult holding would take place in two new rectangular raceways. These raceways would not produce a substantial amount of waste because the adults are not fed and thus, do not produce meaningful amounts of fecal material or leave uneaten feed. When adults die in

the raceways, the carcasses would be immediately removed and disposed of as solid waste. As a result, the adult holding effluent is considered clean and is discharged directly to the river without treatment, as is standard practice in Pacific Northwest hatcheries.

Proposed Circular Raceways: The circulars would be operated such that 10 to 20 percent of the inflow exits the tanks through the center bottom (sump) drain and 80 to 90 percent of the inflow exits through the side (skimmer) drain. It is anticipated that at least 90 percent of the waste solids would exit from the sump drain. The sump drain would be connected to the pollution abatement pond for removal of the solids, while the skimmer drain would be directly discharged to the river without treatment. These side drain flows would be considered clean because of the in-vessel settlement and the removal of solids in the sump drain.

Pollution Abatement Ponds: Gravity settling processes are referred to as clarifiers or, in the case of many hatcheries, pollution abatement ponds. Clarifiers are sized based on the settling velocity of the particles to be settled. The settling basin would have two cells with a common center wall, each with dimensions of 15 feet by 40 feet. During solids removal, one cell would be taken offline during a period of low hatchery flows and water would be treated in a single cell. After decanting the offline cell to the in-service cell and air drying the solids, a front-end loader or similar equipment would remove the solids and spread them on site as compost.

2.2.3 Optional Items

These construction items have been identified as optional, depending on total construction costs and if budget is available to construct these items.

2.2.3.1 Hatchery Administration Building

The administration building is eligible for inclusion on the National Register of Historic Places (NRHP), but no significant changes to the building's exterior would occur. The remodel of the interior of the administration area would include stripping and upgrading the exterior walls to add insulation and replacing exterior doors and windows. The building finishes and fixtures would be of high quality and durable. The office would include areas for reception, offices, meeting space, and restrooms with showers.

2.2.3.2 Hatchery Residences

Up to two new residences (each approximately 2,500 square feet) would be provided to allow hatchery workers and their families to live on site. New residences would require site improvements in one of two locations for water supply, fire protection, and waste disposal.

The new residence buildings would be located outside the 100-year floodplain to the southeast of the proposed hatchery facilities. The potential disturbance area would be approximately 3 acres. The houses would have septic tanks for waste disposal and domestic supply from the Indian Ford A Spring system.

2.2.3.3 Predator Control Netting

The existing bank C raceways would be enclosed by a counterweight supported cable and netting predator control system to prevent disease transmission and avian and terrestrial predation. The design would also allow any accumulation of snow or ice to shed easily from the cables and discourage damage during winter storms. The galvanized posts and beams would be supported with drilled, reinforced concrete piers. Fixed netting would be hung along the sides of the raceways to fully enclose all eight raceways.

2.3 COMPARISON OF ALTERNATIVES

Table 2-1 summarizes and compares the potential environmental consequences of the alternatives. See Chapter 3 for a full discussion of environmental consequences.

Table 2-1. Comparison of Environmental Consequences of the Alternatives

Resource Area	No Action Alternative	Proposed Action
Transportation	No construction actions would occur and therefore there would be **no impact** to transportation under the No Action Alternative.	The Proposed Action would result in **short-term, adverse, low impacts** to transportation. During construction activities there would be a slight increase in traffic on Glenwood Highway, Fish Hatchery Road, and the access road north of the hatchery that connects to River Route Road and Champion Road. This increase in traffic would be short-term and low impact.
Geology and Soils	No construction actions would occur and therefore there would be **no impact** to geology and soils under the No Action Alternative.	The Proposed Action would result in **short-term, adverse, low impacts** to geology and soils. The grading and improvements along the spring intake access road as well as the installation of the new pipeline support structures could result in erosion and compaction. Construction BMPs such as an erosion plan and a revegetation plan would be followed to reduce such impacts and re-stabilize the soil following construction activities.

Resource Area	No Action Alternative	Proposed Action
Vegetation and Noxious Weeds	No construction actions would occur and therefore there would be **no impact** to vegetation under the No Action Alternative.	The Proposed Action is expected to result in **short-term, adverse, low impacts** to vegetation during construction. Access road re-grading and the installation of the new spring intake pipeline would remove vegetation; however, vegetation that would be removed is small (trees <6-inch diameter and shrubs). The two optional residences would remove vegetation in a 3-acre area composing mostly of invasive vegetation as well as seven mature Douglas-fir trees. No rare or special status plants were found within the project vicinity and therefore, would not be impacted. Construction BMPs such as a revegetation plan and measures to prevent invasive species from entering the project area would reduce the spread and establishment of invasive species. Construction BMPs for spill prevention, containment, and control would also be implemented to prevent impacts to existing vegetation.

Resource Area	No Action Alternative	Proposed Action
Water Quantity, Rights, and Quality	No construction actions would occur and therefore there would be **no impact** to surface and groundwater quantity and rights under the No Action Alternative. No construction actions would occur and therefore there would be **no short-term impact** to water quality under the No Action Alternative. Ongoing activities at the Klickitat Hatchery such as effluent discharge entering the Klickitat River could have **long-term, adverse, low impacts** to water quality.	The Proposed Action would result in **short-term, adverse, low impacts** to surface and groundwater quantities. There would be **no long-term impact** to surface or groundwater rights at the hatchery. Construction activities may cause soil compaction and locally impact groundwater recharge or increase surface water runoff. However, these impacted areas are minimal and construction BMPs such as decompaction techniques would be used to reduce such impacts. The Proposed Action would have **short-term, adverse, low impacts** on water quality. Construction activities such as demolition, ground disturbance, and vegetation removal are within close proximity to the Klickitat River and its tributaries indicating there is the potential for local adverse water quality impacts. However, construction activities closest to the Klickitat River would occur during low flow periods to minimize potential effects. Additionally, the construction contractor would follow BMPs such as a Spill Prevention, Containment, and Control Plan (SPCCP), stormwater pollution and prevention plan, and designating staging areas at least 50 feet away from surface waters. These measures would reduce the potential for adverse impacts to water quality. Operational discharge of effluent may increase by up to 4 cfs relative to the No Action Alternative but the effluent concentration would not increase. The hatchery would continue to comply with the current NPDES permit. This impact would be **long-term, adverse, and very low.**

Resource Area	No Action Alternative	Proposed Action
Wetlands and Floodplains	No construction actions would occur and therefore there would be **no impact** to wetlands and no new impacts to floodplains under the No Action Alternative.	The Proposed Action would result in **no impacts** to wetlands or floodplains. No ground disturbing work would occur in the floodplain. Work in the floodplain would be limited to rehabilitation of the existing pump station. No construction activities would occur in wetlands. Ground disturbing activities would occur adjacent to two wetlands in the project vicinity, but BMPs would be used to isolate these areas, and the wetland hydrology would not be impacted. Construction actions would occur landward of the OHWM at the Indian Ford A Spring. Construction BMPs for sediment containment, dewatering, including a SPCCP, would minimize potential impacts to adjacent waters and temporarily affected areas would be restored.
Fish	No construction actions would occur and therefore there would be **no impact** to fish under the No Action Alternative.	The Proposed Action is anticipated to result in **short-term, adverse, low impacts** to fish. No instream work in the mainstem Klickitat River would occur and therefore no modifications or impacts to aquatic habitat are expected. Construction noise would attenuate upon entering the water column but could cause temporary displacement of juvenile and adult fish. Minor increases in turbidity of the water due to upland soil disturbances may occur, but such increases would not rise to levels harmful to fish, and construction BMPs such as a stormwater pollution and prevention plan would reduce such impacts. No fish mortality would be expected from the Proposed Action. The Proposed Action would facilitate implementation of the Yakama Nation's Spring Chinook Master Plan and the transition to an integrated hatchery program, which is considered to produce **long-term benefits** for the spring Chinook population in the Klickitat River Subbasin.

Resource Area	No Action Alternative	Proposed Action
Wildlife	No construction actions would occur and therefore there would be **no impact** to wildlife under the No Action Alternative.	The Proposed Action is expected to have **short-term, adverse, low impacts** on non-sensitive or special-status wildlife species. The impacts associated with construction noise have the potential to disturb and displace wildlife. However, this would be temporary, and construction BMPs would be implemented to reduce potential impacts. The Proposed Action is expected to have **short-term, adverse, low impacts** on sensitive or special-status wildlife species. The northern spotted owl, for example, has the potential to occur in the project vicinity and has the highest potential for impacts, but tree removal activities would not take place during nesting season to reduce displacement potential. The use of BMPs would minimize direct impacts to wildlife from construction and reduce the severity of displacement impacts. The increase in salmon smolts may increase food availability for predatory and scavenging wildlife species, resulting in a **long-term, beneficial, low impact** to wildlife.

Resource Area	No Action Alternative	Proposed Action
Recreation	No construction actions would occur and therefore there would be **no impact** to recreation under the No Action Alternative. The No Action Alternative may have **moderate, adverse impacts** on the Klickitat River's recreational fishery in the **long term** due to the decreased hatchery production and therefore decreased harvest potential.	The Proposed Action would result in **short-term, adverse, low impacts** on recreation. However, the project would have **long-term, beneficial, low impacts** to recreational fishing due to increased salmon stocks. Public access to the hatchery would be limited during construction activity for public safety, which may interrupt boat launch access in the immediate project vicinity. There would be no navigational impact on recreational use of the river, and no changes to nearby rafting access points outside the Yakama Nation Reservation boundaries would occur.
Historic and Cultural Resources	No construction actions would occur and therefore there would be **no impact** to historic and cultural resources under the No Action Alternative.	The Proposed Action would result in **no-to-low, long-term, adverse impacts** to historic and cultural resources. The selected construction contractor would coordinate with the Yakama Nation to avoid any identified cultural resources in the project area, and proposed work to the NRHP-eligible fish hatchery building would be coordinated with the Yakama Nation Tribal Historic Preservation Office to ensure compliance with laws and regulations. Additionally, BMPs such as the completion of an inadvertent discovery plan would be completed to prevent potential disturbances.

Resource Area	No Action Alternative	Proposed Action
Air Quality	No construction actions would occur and therefore there would be **no impact** to air quality under the No Action Alternative.	The Proposed Action is expected to result in **short-term, adverse, low impacts** to air quality. The use of heavy machinery during construction would result in minor diesel emissions and generation of dust; however, these pollutants would not be of sufficient quantity to exceed applicable air quality standards. The use of construction best management practices (BMPs) to minimize fugitive dust and emissions would reduce such impacts.
Greenhouse Gases and Climate Change	No construction actions would occur and therefore there would be **no impact** to greenhouse gases and global climate change under the No Action Alternative.	The Proposed Action would result in **short-term, adverse, low impacts** to greenhouse gas emissions and global climate change as well as **long-term, beneficial, low impacts** to salmon and other organisms that have the potential to be impacted by climate change. The use of gasoline and diesel-fueled construction equipment would result in a temporary increase in greenhouse gas emissions; however, these emissions would be minor and are not considered large enough for regulatory reporting. Construction BMPs would be followed to reduce the potential for adverse impacts.
Visual Quality	No construction actions would occur and therefore there would be **no impact** to visual quality under the No Action Alternative.	The Proposed Action is expected to have **long-term, adverse, low impacts** to visual quality. New structures would be constructed including circular raceways, a spawning facility, distribution box, the fishway, and the replacement of the adult holding facility as well as two optional residences in the southeast end of the project area. These new structures would cause a slight change to the visual quality compared to existing conditions, but the project area overall would remain consistent with the existing rural and surrounding woodland aesthetic. Construction lighting and machinery would have a **short-term, adverse, moderate impact** but this would be temporary.

Resource Area	No Action Alternative	Proposed Action
Noise	No construction actions would occur and therefore there would be **no impact** to noise under the No Action Alternative.	The Proposed Action would result in **short-term, adverse, low noise impacts**. Noise disturbance would be limited to construction activities such as clearing, grading, limited excavation, demolition, building repairs, and vehicle traffic to and from the site. Work would typically occur during the daylight hours and no pile driving, drilling, or blasting is anticipated. Noise may cause a disturbance to wildlife; however, the dense vegetation surrounding the site and topographic changes would likely absorb the sound and reduce potential noise impacts. No noise sensitive receptors such as wildlife or humans exist within the operational facility. Potential noise impacts to ESA-listed wildlife species have been evaluated in a Biological Assessment (BA) which informs the analysis for this EA. The BA found that noise is not likely to adversely affect listed species.
Public Health and Safety	No construction actions would occur and therefore there would be **no impact** to public health and safety under the No Action Alternative.	The Proposed Action would result in **short-term**, **adverse, no-to-low impacts** to public health and safety. The public would have limited access to the project area during construction activity so there would be no public health and safety risk to the general public. Construction activities have the potential to increase safety risks for construction workers and hatchery employees due to increased hazardous materials such as concrete, diesel, and fuel. There is also an increased risk of traffic collisions, hazardous road conditions and wildlife strikes for construction workers traveling to and from the construction site. BMPs would be followed to reduce these types of risks.

Resource Area	No Action Alternative	Proposed Action
Socioeconomics and Environmental Justice	No construction actions would occur and therefore there would be **no impact** to socioeconomics and environmental justice under the No Action Alternative.	***Socioeconomics:*** The Proposed Action would result in **short-term, and long-term beneficial low impacts** to socioeconomics. The Proposed Action would require hiring construction workers that would inhabit local hotels, increase local spending, and therefore create a temporary beneficial economic impact. In accordance with the Yakama Nations' Tribal Employment Rights Ordinance, jobs created by the project could benefit Native American workers. Additionally, the two optional residences would provide housing and employment to two additional employees and their families. Increased fish production and release may result in greater fish harvest by sport fishermen and subsistence users. **Short-term, adverse, low impacts** to socioeconomics would also occur under the Proposed Action because construction activities would result in a temporary increase in traffic and a minor restriction in access to the Klickitat Hatchery, but these adverse effects would be temporary. ***Environmental Justice:*** Although the Yakama Nation is an Indian Tribe and there are low-income and minority populations on the Yakama Nation Reservation, the Proposed Action would not result in disproportionately high and adverse effects to either the Yakama Nation or any low-income or minority populations, thus, there would be **no** environmental justice impacts. The increase in fish hatchery production may provide **long-term moderate beneficial impacts** to the Yakama Nation by enhancing fish populations, protecting treaty rights, improving ecosystem health, and supporting traditional subsistence diets and economic activities.

Resource Area	No Action Alternative	Proposed Action
Cumulative Impacts	The No Action Alternative would contribute **no significant cumulative impacts.** Without the implementation of the proposed hatchery improvements and increased salmon smolt, the Chinook salmon population would be less resilient to impacts of climate change, therefore the No Action Alternative could have **long-term, adverse, low impacts** to fish, climate change, recreation, and socioeconomics.	Past, present, and reasonably foreseeable future projects within the project vicinity, in combination with the Proposed Action, **would not result in any significant cumulative impacts to** affected resources. Most cumulative impacts would be low and short-term as they would result from effects occurring concurrently with temporary construction activities. Low-to-moderate adverse cumulative impacts to vegetation, geology and soils, water resources, wildlife, and fish may occur. These impacts would combine with past, present, and reasonably foreseeable future action, such as forest management activities, access road maintenance and construction, future hatchery improvements, and nearby agricultural activities plus impacts from the Proposed Action such as increased compaction from construction equipment, increased erosion from construction activities, increased potential for sediment runoff and decreased water quality, temporary noise disturbance and displacement impacts to wildlife and fish, and short-term impacts to wildlife habitat and fish habitat. With the implementation of construction BMPs such as erosion control measures, sound-control devices, and revegetation plans, cumulative impacts would be short-term and would not create any long-term significant cumulative impacts to affected resources.

2.4 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

Best management practices and mitigation measures for the Proposed Action are identified in Table 2-2. BPA, Yakama Nation, and their contractors would each play a role in implementing mitigation measures during various phases of project work. Relevant portions of the Mitigation Action Plan, which will be attached to the Finding of No Significant Impact, would be included in the construction contract specifications. The contractor would be obligated to implement the mitigation measures identified in the Mitigation Action Plan that relate to contractor responsibilities during construction

and post-construction. The construction contract specifications would include relevant portions of the Mitigation Action Plan.

Table 2-2. Best Management Practices and Mitigation Measures

Best Management Practice and Mitigation Measure	(Who/When)
Transportation	
Employ traffic control flaggers and post signs warning of construction activity and merging traffic, when necessary for any potential interruptions of traffic.	BPA/Contractor; During construction
Follow the applicable state, county, and city requirements for traffic control and lane closures.	BPA/Contractor; During construction
Geology and Soils	
Minimize the construction disturbance area and removal of vegetation to the greatest extent possible.	BPA/Contractor; During construction
Locate staging areas in previously disturbed areas of the main hatchery complex to minimize soil and vegetation disturbance.	BPA/Contractor; During construction
Minimize the area of soil exposed and use dust abatement measures when necessary (see mitigation measures in Air Quality).	BPA/Contractor; During construction
Stabilize disturbance areas by applying a weed-free gravel (if available).	BPA/Contractor; During construction
Conduct project construction along the spring intake access road, spring intake work, and pipeline installation, during the fall and winter (September through January) during low water-use at the hatchery to minimize erosion, compaction, and sedimentation, to the extent practicable.	BPA/Contractor; During construction
Install appropriate erosion-control devices such as silt fencing, weed-free straw wattles, and sediment barriers where needed to minimize soil transport.	BPA/Contractor; During construction
Prepare an erosion control plan to minimize sediment runoff and fugitive dust.	BPA/Contractor; Before construction
Vegetation and Noxious Weeds	

Best Management Practice and Mitigation Measure	(Who/When)
Implement a noxious weed control program which includes the following elements: • Clean equipment and vehicles of mud, dirt, and plant parts before entering the project area and before leaving the project area to minimize the spread of invasive or noxious weeds. • Prohibit discharge of vehicle wash water into any stream or water body. • Limit construction activities to areas needed to work effectively to prevent native or desirable plant disturbance.	BPA/Contractor; Before, during, and after construction
Implement a revegetation plan to restore native plant communities and provide wildlife habitat and include the following elements: • Reseed disturbed areas after construction with native vegetation. • Monitor seeded and planted areas until disturbed areas are stabilized (defined as at least 70% cover by native or acceptable non-native species) and reseed or replant if necessary to ensure native vegetation is established.	Yakama Nation, BPA/Contractor; After construction
Water Quality and Quantity, Wetlands, and Floodplains	
Prepare and implement a Stormwater Pollution Prevention Plan (SWPPP) that would include BMPs such as installation of silt fences, straw wattles, and jute matting.	BPA/Contractor; Before and during construction
Inspect erosion and sediment controls weekly, maintain them as needed to ensure their continued effectiveness, and remove them from the proposed hatchery site when vegetation is re-established, and the area has been stabilized.	BPA/Contractor; During construction
Implement a Spill, Prevention, Control, and Countermeasure Plan (SPCCP) to prevent chemicals from entering water resources.	BPA/Contractor; Before and during construction
Locate vehicle staging, cleaning, maintenance, refueling, and fuel storage areas a minimum of 150 feet from water sources.	BPA/Contractor; During construction
Wash heavy equipment before delivery to project site to remove oils, fluids, grease, etc. Inspect and clean equipment regularly. Prohibit discharge of vehicle wash water into any stream, water body, or wetland without pre-treatment to meet state water quality standards.	BPA/Contractor; Before and during construction
Follow project-specific Clean Water Act (CWA) protection measures as required by contractor-acquired permitting.	Contractor; During construction
To the extent possible, conduct ground-disturbing construction activities during the dry season.	BPA/Contractor; During construction

Best Management Practice and Mitigation Measure	(Who/When)
Comply with the National Pollution Discharge and Elimination System (NPDES) General Permit for construction activities.	BPA/Contractor; During construction
Implement a revegetation plan to restabilize soils (see mitigation measures in Vegetation and Noxious Weeds).	Yakama Nation, BPA/Contractor; After construction
Fish	
Apply protective measures resulting from consultation with U.S. Fish and Wildlife Service (USFWS) and NMFS.	BPA/Contractor; During construction
Prepare and implement an SWPPP that would include appropriate BMPs such as delineation of construction limits within 200 feet of streams and wetlands and installation of silt fences, weed-free straw wattles, and jute matting.	BPA/Contractor; Before and during construction
Develop and implement an SPCCP.	BPA/Contractor Before and during construction
Use construction BMPs to limit turbidity impacts such as regularly monitoring turbidity levels and ensure they are within the allowable limits.	BPA/Contractor; During construction
Reduce construction noise and vibration as much as possible to prevent fish disturbance and displacement.	BPA/Contractor; During construction
Wildlife	
Coordinate timing and methods of construction with USFWS to minimize disturbance to ESA-listed species and life stages.	BPA/Contractor; Before and during construction
Coordinate with BPA and Yakama Nation biologists prior to construction to identify and avoid removing vegetation that may provide nesting habitat during the migratory bird or northern spotted owl nesting season (approximately late February until late August).	BPA/Contractor; During construction
Clean and maintain work areas with proper trash control and sanitation to prevent wildlife attraction.	BPA/Contractor; During construction
Implement measures to control erosion (see mitigation measures in Geology and Soils), potential spills of hazardous materials through the implementation of an SPCCP, and minimize potential for impacting habitat.	BPA/Contractor; Before and during construction
Implement a revegetation plan to improve and reduce alterations to wildlife habitat (see mitigation measures in Vegetation and Noxious Weeds).	BPA/Contractor; After construction

Best Management Practice and Mitigation Measure	(Who/When)
Minimize construction noise and vibration as much as possible (see mitigation measures in Noise).	BPA/Contractor; During construction
Recreation	
Post appropriate contact information on site for contractor liaisons and project staff to address any concerns or complaints during construction.	BPA/Contractor; During and after construction
To the extent practicable, limit construction activity to 7:00 AM to 8:00 PM to minimize impacts to nearby residents and recreational visitors.	BPA/Contractor; During construction
Inform local rafting operations when feasible and post notices at the hatchery entrance describing the construction schedule and any anticipated disruptions for recreational boating access in the project vicinity.	BPA/Contractor; During construction
Historic and Cultural Resources	
Flag off known culturally sensitive areas to ensure that staging and construction activities avoid these areas.	BPA/Contractor; During construction
Ensure a cultural resource monitor from the Yakama Nation is on site to monitor any construction work carried out within 30 yards of the flagged avoidance areas.	Yakama Nation, BPA/Contractor; During construction
Prepare an Archaeological/Cultural Resource Inadvertent Discovery Plan to be reviewed by the Yakama Nation Tribal Historic Preservation Office and distributed to project personnel prior to construction.	Yakama Nation, BPA; Before construction
Protect any unanticipated cultural resources or human remains discovered during construction as follows: • Stop work in the immediate vicinity of the discovery and protect findings in place. • Notify the BPA Environmental Lead (Carolyn Sharp; 503-230-5206 or 503-728-8010) and BPA Archaeologist (Jenna Peterson; 503-230-3018) who would make appropriate contacts and arrange for the resource to be evaluated. • Take reasonable steps to ensure the confidentiality of the discovery site and restrict access to the discovery site.	Yakama Nation, BPA/Contractor; During construction
Air Quality	
Sequence and schedule work to reduce the amount of bare soil exposed to wind erosion, as appropriate.	BPA/Contractor; During construction
Implement measures to control fugitive dust and drive vehicles at a low speed (less than 5 miles per hour) on access roads to minimize dust.	BPA/Contractor; During construction

Best Management Practice and Mitigation Measure	(Who/When)
Ensure spill containment equipment is available during the application of dust abatement chemicals.	BPA/Contractor; During construction
Do not burn vegetation or other debris associated with construction clearing.	BPA/Contractor; During construction
Ensure that construction contractor complies with all applicable regulations concerning air pollution control.	BPA/Contractor; During construction
Ensure that construction contractor uses appropriate BMPs to reduce emissions, such as minimizing idling times.	BPA/Contractor; During construction
Greenhouse Gases and Climate Change	
Ensure all vehicles are in good operating condition to minimize exhaust emissions.	BPA/Contractor; During construction
Turn off construction equipment during prolonged periods of non-use to reduce emissions.	BPA/Contractor; During construction
Encourage the use of proper size of construction equipment for the job to maximize energy efficiency.	BPA/Contractor; During construction
Use alternative fuels, such as propane, for stationary equipment at the construction sites or use electrical power where practicable.	BPA/Contractor; During construction
Visual Quality	
Require contractors to maintain a clean construction site.	BPA/Contractor; During construction
Remove all temporary structures, devices, materials, and equipment from the site upon completion of all construction activities; and dispose of all excess spoils and waste materials in compliance with federal, state, and local regulations.	BPA/Contractor; After construction
Noise	
Use sound-control devices on all construction equipment powered by gasoline or diesel engines.	BPA/Contractor; During construction
Operate and maintain all equipment to minimize noise and turn off construction equipment when not in use for prolonged periods (e.g., minimize idling).	BPA/Contractor; During construction
Public Health and Safety	
Coordinate with local law enforcement, fire protection, and other emergency responders to ensure they are prepared to address any emergencies that may arise during construction.	BPA/Contractor; Before construction

Best Management Practice and Mitigation Measure	(Who/When)
Prepare a safety plan in compliance with state requirements before starting construction; specify how to manage hazardous materials such as fuel and any toxic materials found in work sites; include a fire prevention and suppression plan and detail how to respond to emergency situations. Keep the safety plan on site during construction and maintain and update as needed.	BPA/Contractor; Before construction
Prepare and implement an SPCCP and include the following: • Reduce and recycle hazardous and non-hazardous wastes • Notification procedures • Specific clean-up and disposal instructions for different products • Quick response containment and clean-up measures • Proposed methods of disposal of spilled materials • Employee training on spill containment	BPA/Contractor; Before construction
Train staff in the proper use, transport, handling, and storage of all chemicals to minimize dangers of overexposure or accidental release to the environment.	BPA/Contractor; Before construction
Conduct all project-related activities in compliance with regulations and established guidelines for use, handling, storage, and disposal of toxic and hazardous substances.	BPA/Contractor; During construction
Dispose of non-hazardous waste in approved landfills or recycling areas. Dispose of hazardous wastes according to applicable federal and state laws.	BPA/Contractor; During construction

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following sections describe how the unique resources within the project area would be affected by the evaluated alternatives. The study area for impact analysis encompasses the construction and staging footprint shown in Figure 2-1 unless noted otherwise. Impact levels are characterized as adverse or beneficial. Adverse impacts are those that would result in a negative change to the condition of the resource and beneficial impacts are those that would result in a positive change to the condition of the resource. Duration of the impact is identified as short-term which would be temporary and often associated with construction, or long-term which would be permanent or persistent for a long period of time. Impact intensity is characterized as high, moderate, low, or non-existent (no impact). High impacts are considered to be significant impacts, whereas moderate and low impacts are not.

Resources Not Considered for Further Evaluation

Impacts to land use are not evaluated further because Klickitat Hatchery is located entirely within the Yakama Nation Reservation. No land use designations would change under either alternative that require additional consideration or permitting. All other resources are evaluated below.

3.1 TRANSPORTATION

3.1.1 Affected Environment

The Klickitat Hatchery has several access roads such as Fish Hatchery Road, and major highways connecting to the access roads such as Glenwood Highway and SR-142. The main access road to the hatchery is on the south side of the hatchery via Fish Hatchery Road. This access road is a private, two-lane gravel/dirt county road that branches northeast off Glenwood Highway. This road has a steep grade in some areas but is maintained throughout the year by hatchery personnel. Glenwood Highway is a paved county road that connects Glenwood to SR-142 near Goldendale. Average daily traffic volume on SR-142 after the junction with Glenwood Road was 779 in 2021, and daily traffic volume for Glenwood Highway north of SR-142 was 502 in 2002 (WSDOT 2022). The access road north of the Hatchery, across the Fish Hatchery bridge, is a private, two-lane gravel/dirt road that connects to River Route Road. This road provides access to the upper and lower intake springs north of the hatchery. River Route Road connects to Champion Road, which runs southeast along the Klickitat River where it eventually meets with Glenwood Highway approximately 16 miles southeast of the hatchery upper spring intake access road (Figure 3-1).

The private two-lane gravel road north of the facilities has two unimproved access roads that connect to the spring intakes upslope of the Klickitat River. These roads were likely used when the spring intake diversions were first installed and have not been used in decades. They have new vegetative growth and steep grades and would need to be re-graded and have vegetative growth (all less than 6-inch diameter) removed prior to construction. The access road farther north would be re-graded and used for spring intake access.

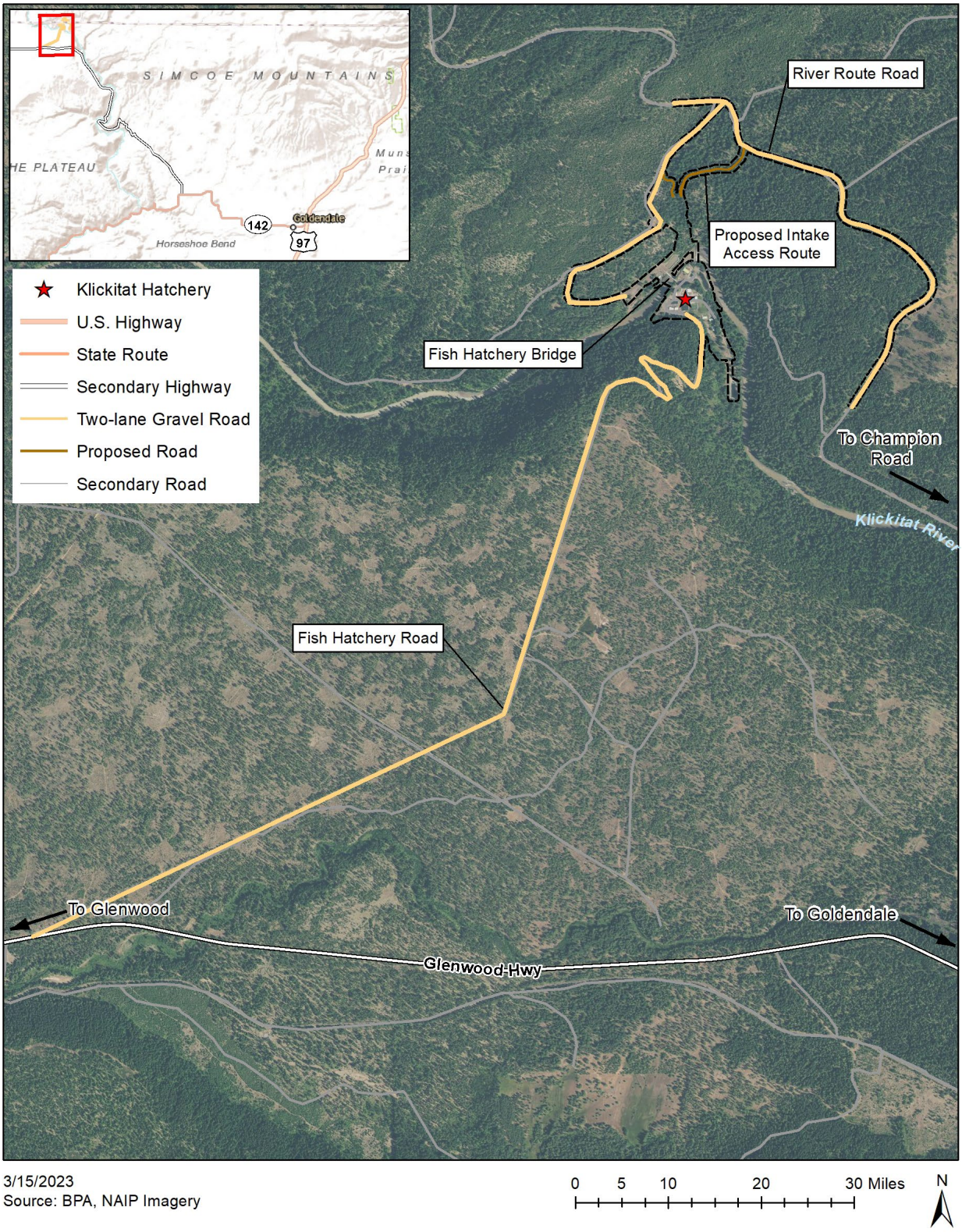


Figure 3-1. Transportation In and Around the Project Vicinity.

3.1.2 Environmental Consequences – Proposed Action

Under the Proposed Action, potential impacts to transportation would be low and short term. Construction workers commuting to the hatchery each day would cause a slight increase in traffic during the week resulting in a minimal increase in average daily traffic in the project area compared to 2021/2022 volumes. This increase in traffic would be low and short-term and construction BMPs, such as temporary signs and warnings of increased traffic would be posted in the area to notify the community. Fish Hatchery Road has steep inclines that may be too steep and difficult to maneuver for larger construction machinery. These large vehicles may need to use the access road north of the hatchery that connects to River Route Road, Champion Road, and eventually Glenwood Highway.

The use of heavy weight, large vehicles could result in a minor temporary increase in traffic on the access road north of the hatchery as well as River Route Road, Champion Road, and Glenwood Highway due to the vehicles' heavy weight and slower stopping times and therefore reduced speed. This effect would be low and short-term. Additionally, the access road to the upper and lower intake springs would be re-graded. This road has not been in use for decades and therefore would not introduce a new transportation-related impact to the local community, but instead would result in a benefit to the hatchery by allowing better access to the spring intakes. Overall, there would be **short-term, adverse, low impacts** to transportation.

3.1.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no new impacts** to transportation from BPA-funded actions. Ongoing actions would continue to have low impacts to transportation.

3.2 GEOLOGY AND SOILS

3.2.1 Affected Environment

The Klickitat River valley is underlain by a combination of basalt flows and unconsolidated sediments. The northern half of the project area, including Indian Ford A Spring, is underlain by a mix of alluvial, glacial, and landslide deposits (Korosec 1987). Steep slopes in the northern half of the project area are countered by flat terraces on either side of the Klickitat River where main hatchery facilities are located. The head of the Indian Ford A Spring system rises almost 300 feet above the river's elevation in the northern part of the project area. Elevation ranges from 1,600 feet near the highest point on the existing northern access road to approximately 1,220 feet at the surface of the Klickitat River (USGS 2020).

The soils in and around the project area are typical of those found within floodplains and along riparian corridors and are identified in Table 3-1. All three soil types in the project area have moderate infiltration when thoroughly wet and have adequate drainage. None of the soils are classified as prime farmland. The soils within the main hatchery footprint are generally sands deposited by riverine transport that have been disturbed during previous hatchery construction and operation. The soils on the northern slopes of the project area where the Indian Ford A Spring upper intake is located are

composed of an organic layer underlain with sandy loam (Natural Resource Conservation Service [NRCS] 2021).

The erosion hazard ratings in Table 3-1 indicate the hazard of soil loss from unsurfaced roads and trails. A 'slight' erosion hazard rating indicates that little or no erosion is likely, while 'severe' indicates that substantial erosion, frequently required maintenance, or costly erosion-control measures could be expected. The soils underlying the main hatchery facilities are well drained and fairly stable, but the soils found on the northern slopes are considered more erodible.

Table 3-1. Soil Types in the Project Vicinity

Map Unit	Name	Surface Texture	Drainage Class	Erosion Hazard Rating
1551	Yedlick stony ashy sandy loam, 8 to 30 percent slopes	Slightly decomposed plant material	Well drained	Severe
1552	Yedlick stony ashy sandy loam, 30 to 45 percent slopes	Slightly decomposed plant material	Well drained	Severe
1906	Fluventic Haploxerolls-Riverwash complex, 0 to 5 percent slopes	Sandy loam	Moderately well drained	Slight

Source: NRCS 2021

Historical landslide deposits with a low to moderate liquefaction susceptibility are mapped on the left bank of the Klickitat River. A northwest-striking strike-slip fault is located approximately 7 miles southwest of the hatchery. No evidence of faulting or slip associated with this geologic hazard within the last 1.6 million years has been identified (Washington Department of Natural Resources [WDNR] 2022).

3.2.2 Environmental Consequences – Proposed Action

The existing access route to the Indian Ford A Spring upper intake structure and pipeline would require some light grading and vegetation removal to allow construction vehicle access. No trenching is included as part of the Proposed Action. Ground disturbance would be limited to excavation for the footings for saddle supports and thrust blocks for the new above-ground pipeline connecting the intake to the hatchery facilities. No additional risk from seismic or geologic hazards is anticipated from the Proposed Action.

As part of the Proposed Action, the construction contractor would be required to prepare an erosion control plan to minimize potential sediment runoff and fugitive dust. The contractor would follow the BMPs outlined in Section 2.4, including the use of silt fencing or straw wattles near the intake (as needed), the revegetation of disturbed slopes (when feasible following construction), limitations on equipment use in areas underlain by highly erodible soils, and scheduling intake work during low-water periods. The contractor would minimize the disturbance area for the pipeline installation to the

extent feasible. Transport of mud, dirt, or surface vegetation outside of the worksite may be prevented with placement of gravel along the proposed access routes. With the implementation of BMPs, **short-term, adverse, low** impacts on soils and geology are expected.

3.2.3 Environmental Consequences – No Action Alternative

BPA would not construct a new pipeline or any facility upgrades at the hatchery. **No** BPA-funded ground-disturbing activities that may **impact** soils or geology would occur. The same seismic and erosional conditions would continue to be present.

3.3 VEGETATION AND NOXIOUS WEEDS

3.3.1 Affected Environment

Vegetation within the project vicinity consists primarily of coniferous forest and mixed deciduous-coniferous woodlands, and some grasslands with invasive or noxious vegetation present in disturbed areas along roadways and high-traffic hatchery operation areas. Other vegetation types found in the project area include riparian areas and wetlands.

No ESA-listed threatened or endangered plant species occur or have the potential to occur within the project area. Fourteen special-status vascular plant species have the potential to occur or occur within five miles of the project area. This information is based on data provided in the Washington Natural Heritage Program (WNHP) rare plant database and a survey of the project area conducted in 2018 (WNHP 2021; BPA 2022). Of the 14 special-status vascular plant species, three are State threatened, ten are State sensitive species and the one remaining species is thought to be extinct or extirpated (Table 3-2).

Of the 14 special-status vascular plant species, two have the potential to occur within one mile of the project area. Pulsifer's monkeyflower (*Erythranthe pulsiferae*) occurs in seasonally wet or moist open areas; often in exposed mineral soil or in openings with ponderosa pine (*Pinus ponderosa*), Douglas-fir (*Pseudotsuga menziesii*), and oak (*Quercus* sp.). Marginate splashzone moss *(Scouleria marginata)* occurs on bedrock or large boulders at the waterline of perennial rivers and streams. During the 2018 survey, no rare or special-status species were found within the project area (BPA 2022b).

Table 3-2. Known Occurrences of Special-Status Plant Species Within Five Miles of the Project.

Scientific Name Common Name	WNHP Status	Element Occurrence (EO) number, Date observed in WNHP record
Agoseris elata Tall agoseris	Sensitive Historic	EO ID 2754, observed 08-13-1906
Calochortus longebarbatus var. longebarbatus Long-bearded sego lily	Sensitive	EO-ID 8686, observed 07-2012; EO ID 7288, observed 09-07-2018 EO-ID 8569, observed 07-19-2010

Scientific Name Common Name	WNHP Status	Element Occurrence (EO) number, Date observed in WNHP record
Erythranthe pulsiferae Pulsifer's monkeyflower	Sensitive	Hatchery is within a WNHP occurrence area for EO-ID 6969; last observed June 1938
Erythranthe washingtonensis Washington monkeyflower	Extinct or Extirpated; Historic	EO ID 5236, last observed August 5, 1903
Isoetes nuttallii Nuttall's quillwort	Sensitive	EO ID 1330, last observed 06-05-2014 EO ID 9815
Juncus hemiendytus var. hemiendytus Dwarf rush	Sensitive	EO ID 5698; last observed May 11, 1910 EO ID 8731
Liparis loeselii Bog twayblade	Sensitive	EO ID 2358, last observed 06-1909
Ophioglossum pusillum Adder's-tongue	Sensitive	EO ID 6725, last observed 1882 (no month or day provided) EO ID 3432
Penstemon barrettiae Barrett's beardtongue	State Threatened	EO ID 2224; last observed 06-29-2018
Polygonum parryi Parry's knotweed	Sensitive	EO ID 4583, last observed July 17, 1886
Rotala ramosior Lowland toothcup	State Threatened	EO ID 6936; last observed 06-29-2008 EO ID 8568
Scouleria marginata Marginate splashzone moss	State Threatened	Occurrence polygon; last observed 10-30-1930, EO#8
Utricularia intermedia Flat-leaved bladderwort	Sensitive Historic	EO ID 1838; last observed June 24, 1893
Zeltnera muehlenbergii Monterey centaury	Sensitive	EO ID 4180; last observed 07-16-1896

Source: WNHP 2021

Based on a vegetation survey conducted in 2018, non-native species and noxious weeds have been identified within the project area including mullein (*Verbascum thapsus*), oxeye daisy (*Leucanthemum vulgare*), English plantain (*Plantago lanceolata*), dandelion (*Taraxacum officinale*), tumble knapweed (*Centaurea diffusa*), wild lettuce (*Lactuca* sp.), sheep sorrel (*Rumex* sp.), bird's foot trefoil (*Lotus corniculatus*), St. John's wort (*Hypericum perforatum*), Queen Anne's lace (*Daucus carota*), salsify

(*Tragopogon* sp.), hairy cat's ear (*Hypochaeris radicata*), stork's-bill (*Erodium cicutarium*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), licorice root (*Ligusticum* sp.), red clover (*Trifolium pratense*), rabbit's foot clover (*T. arvense*), white clover (*T. repens*) and hop clover (*Trifolium* sp.). Non-native grass species such as bulbous bluegrass (*Poa bulbosa*), bluegrass (*P. pratensis*), reed canary grass (*Phalaris arundinacea*), velvet grass (*Holcus lanatus*), and orchard grass (*Dactylis glomerata*) were found throughout the project area as well as the non-native bracken fern (*Pteridium aquilinum*).

3.3.2 Environmental Consequences – Proposed Action

Under the Proposed Action, there would be a short-term low impact to vegetation. Vegetation removal across the limits of construction is expected to be minimal. Temporary staging areas and equipment storage would be located in areas already disturbed and free of vegetation. The majority of construction would occur within the hatchery facilities that are already free from vegetation. For better access to the upper and lower spring intakes, an unimproved access road would be re-graded and small trees (less than 6-inch diameter) and shrubs would be removed. For installation of the above-ground pipeline from the upper spring intake to the hatchery facilities, small vegetation and up to five large trees may be removed. The new 24-inch diameter pipeline would be installed parallel to the existing 19-inch pipeline. Since vegetation was cleared for the existing pipeline during initial construction of the facilities in the 1950s, any trees removed in this vicinity would be less than 70 years old and therefore not considered old growth. Additionally, if the two optional residences are constructed, the vegetation at this 3-acre area would be permanently removed. The 2018 vegetation survey indicated there were no special-status species occurring within this area and the site was mostly vegetated with invasive or noxious species along with seven Douglas-fir trees. This optional residence construction would be on a small-scale, resulting in a long-term, low impact. Disturbed soils would be re-vegetated with appropriate native vegetation, and monitored to ensure planting success (defined as at least 70% cover by native or acceptable non-native species). Reseeding or replanting would occur as necessary to ensure native vegetation is established.

Disturbed areas are likely to be recolonized by non-native, weedy species if left untreated. Weed seeds may also be introduced by contaminated equipment. To reduce the spread of invasive or noxious weeds, construction equipment would be cleaned before it is brought to the project area and after it leaves the construction site, and all disturbed areas would be revegetated with appropriate native vegetation.

There would be **no impact** to special-status plant species. The 2018 rare plant survey indicated no rare or special-status plant species were found in the project area. The potential for these species to occur in the hatchery vicinity is low since it is developed and under regular use. To prevent potential impacts to special-status plant species, BPA would conduct a vegetation survey prior to construction to check for rare or special-status plants in the spring intake pipeline and access road areas.

The Proposed Action is expected to result in **short-term, adverse, low impacts** to vegetation.

3.3.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no impact** to vegetation.

3.4 WATER QUANTITY, RIGHTS, AND QUALITY

3.4.1 Affected Environment

3.4.1.1 Surface and Groundwater Quantity and Rights

The Klickitat watershed (HUC 17070106), or Water Resource Inventory Area 30, drains a mostly undeveloped area of approximately 1,350 square miles. The headwaters of the Klickitat River originate from the Goat Rocks Wilderness area, Mount Adams, and Cascade foothills. The Klickitat River is fed by early spring/summer snowmelt and late spring/summer glacial melt. These surface waters flow unregulated generally south in a narrow valley for approximately 95 miles through the Yakama Nation Reservation and Yakima and Klickitat counties before the river's confluence with the Columbia River (RM 180.4). Precipitation in Klickitat watershed is highly variable as it is dependent on elevation and location east or west in the basin, but in general, little rainfall occurs in a mostly arid central Washington climate (Aspect 2007).

Peak flows in the mainstem Klickitat River are most likely to occur in late May to early June (Watershed Professionals Network et. al. 2005). Mean monthly discharge in the upper Klickitat River, above the West Fork Klickitat River near Glenwood and upstream of the hatchery, for the period of record available upon data query (1944-10-01 to 2021-10-31) at U.S. Geological Survey (USGS) site 14107000 was 898 cubic feet per second (cfs) and 667 cfs for May and June respectively (USGS 2022). The lowest mean of monthly discharge for the period of record at the same USGS station occurred in September (100 cfs). Mean monthly discharge in the Klickitat River, below Summit Creek near Glenwood and downstream of the hatchery, for the period of record available upon data query (1996-10-01 to 2021-12-31) at USGS site 14111400 was 2,360 cfs and 1,780 cfs for May and June respectively (USGS 2022). The lowest mean of monthly discharge for the period of record at the same USGS station also occurred in September (744 cfs).

Water is supplied for the hatchery facility by several sources of surface and groundwater. Seven water right certificates or permits are active for WDFW for fish propagation and domestic uses at the Klickitat Hatchery (Table 3-3). Across the watershed, agricultural irrigation accounts for the majority of the total water use, including surface water and groundwater (Aspect 2007). This account is based on information from Ecology's Water Rights Tracking System (Ecology 2022a).

Table 3-3. Active Water Right Certificates/Permits for the Klickitat Hatchery

Record No.	Source Name	Quantity (cfs)	Device Type	Purpose
S4-28163CWRIS	Indian Ford Springs	0.07	Headworks (Gravity)	Domestic Multiple, Fish Propagation

Record No.	Source Name	Quantity (cfs)	Device Type	Purpose
S4-27553CWRIS	Unnamed Spring	4.00	Headworks (Gravity)	Fish Propagation
S4-27554CWRIS	Klickitat River	20.00	Surface Water Pump	Fish Propagation
S4-01258CWRIS	Wonder Springs Crk.	12.00	Headworks (Gravity)	Fish Propagation
S4-*07272CWRIS	Indian Ford Springs	15.00	Headworks (Gravity)	Fish Propagation
S3-+22202CWRIS	Indian Ford Spr. #1	12.00	Headworks (Gravity)	Fish Propagation
S4-30084	Klickitat River	10.00	Surface Water	Fish Propagation

Source: Ecology 2022a

Groundwater springs are the primary source of water for the Klickitat Hatchery. Groundwater lies within the basalt bedrock and in surficial alluvium within the Klickitat watershed (Watershed Professionals Network et. al. 2005). Groundwater pumped from on-farm wells is also the main source of irrigation water in the watershed because there are very few water storage reservoirs and surface water conveyance systems (Aspect 2007). Infiltration of rain and snowmelt is the primary driver of groundwater recharge, and seepage surface waters, return flows from irrigation, and septic systems are secondary drivers (Watershed Professionals Network et. al. 2005).

3.4.1.2 Water Quality

Freshwater beneficial use designations for the Klickitat River from the Little Klickitat River (RM 19.8) to its headwaters at Diamond Fork, inclusive of the river reach within the project area, include: 1) core summer salmonid habitat; 2) primary contact recreation; 3) domestic, industrial, agricultural, and stock water supplies; and 4) miscellaneous uses (e.g., wildlife habitat, harvesting, commerce/navigation, boating, and aesthetics). Water quality criteria are established by Ecology, with EPA guidance, to protect the beneficial uses (Table 3-4).

Table 3-4. Surface Water Quality Standards within the Klickitat Hatchery Reach of the Klickitat River

Criterion	Standard
Temperature	16°C (60.8°F)
Supplemental Spawning	None
Dissolved Oxygen	9.5 mg/L
pH	pH shall be within the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 units
Turbidity	5 Nephelometric Turbidity Units (NTU) over background when the background is 50 NTU or less; or

Criterion	Standard
	a 10% increase in turbidity when the background turbidity is more than 50 NTU
Bacteria[1]	To protect recreational use: *E. coli* organism levels must not exceed a geometric mean value of 100 CFU or MPN per 100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 320 CFU or MPN per 100 mL. Other requirements: A minimum of three samples is required to calculate a geometric mean for comparison to the geometric mean criteria. Sample collection dates shall be well-distributed throughout the averaging period so as not to mask noncompliance periods. When averaging bacteria sample values for comparison to the geometric mean criteria, it is preferable to average by season. The averaging period of bacteria sample data shall be ninety days or less.

[1]*E. coli* criteria are expressed as colony forming units (CFU) or most probable number (MPN)
Source: Ecology 2022b

Section 303(d) of the Clean Water Act (CWA) requires states to identify and establish a priority ranking of waters within its boundaries that do not meet applicable water quality standards. When pollutants impair the water quality standards of surface water bodies, Ecology adds the water body to the Section 303(d) list of water quality-impaired waters of the State as required under Section 303(d). No waters within the mainstem Klickitat River from the Little Klickitat River (RM 19.8) to its headwaters at Diamond Fork, inclusive of the river reach within the project area, are listed as water quality impaired (Ecology 2022b). Section 303(d) also requires that states establish Total Maximum Daily Loads (TMDLs), when necessary, to achieve applicable water quality standards. No waters within the mainstem Klickitat River from the Little Klickitat River (RM 19.8) to its headwaters at Diamond Fork, inclusive of the river reach within the project area, require a TMDL. Another driver of water quality during some of the warmer months is periodic releases of large volumes of glacial silt from annual meltwaters and glacial outbursts on Mount Adams. These flows deliver volcanic debris and fine sediments into the major tributaries of the Klickitat River, increasing the background turbidity from the West Fork down to its confluence with the Columbia River (Watershed Professionals Network et. al. 2005).

3.4.2 Environmental Consequences – Proposed Action

3.4.2.1 Surface and Groundwater Quantity and Rights

Construction of the Proposed Action would have **no long-term adverse impacts** to surface or groundwater right at the Klickitat Hatchery. Short-term, low adverse impacts may occur if construction activities temporarily impact surface and groundwater quantities, particularly during construction on Indian Ford A Spring. Soil compaction from heavy construction equipment operations could reduce infiltration and temporarily impact groundwater recharge or increase surface water runoff (or a combination of both). The addition of compacted gravel surfaces for reliable vehicle access routes may also locally impact groundwater recharge and increase surface water runoff. However, areas that heavy equipment would access or that would be surfaced with gravel are minimal, and so the impacts would be minimal relative to the surrounding areas that would remain undisturbed. In addition, sensitive areas near the Indian Ford A Spring would be accessed with tracked equipment which exerts lower ground pressure to minimize the potential for soil compaction. Decompaction techniques would be applied in bare earth areas used as heavy equipment access routes during site restoration activities to ensure revegetation is successful and infiltration rates are restored. Thus, potential impacts from the Proposed Action would be minimal and result in **short-term, adverse, low impacts** to surface and groundwater quantities.

The volume of water diverted from Indian Ford A Spring is likely to increase to provide sufficient flow for the expanded hatchery production of spring Chinook smolts. The current diversion rate of approximately 12 cfs may be increased to up to 16 cfs, which is still well below the amount allowed under current water right. The increased diversion amount would continue to be discharged into the Klickitat River below the hatchery, and there would be no reduction in flow in the mainstem river.

3.4.2.2 Water Quality

Demolition, ground disturbance, limited vegetation removal, and construction activities associated with the Proposed Action would occur for approximately 16 months and cover approximately 20 acres within close proximity of the Klickitat River and its tributaries, and therefore have the potential to adversely impact local water quality. Potential impacts would include temporary and localized increases in suspended sediments resulting from erosion into adjacent waters during construction activities, or from a rainfall event mobilizing sediments. Proposed improvements would add impervious surfaces to the site. In addition, construction-related chemical contaminant spills and wet concrete have the potential to alter local water quality should those substances migrate to adjacent surface waters or shallow sources of groundwater. Construction activities closest to the Klickitat River would correspond with periods of lower flows and water levels in the river to minimize the potential for sediment and contaminant introductions. Streamside (riparian) vegetation removal would not occur. Site grading for the proposed condition would ensure runoff does not route sediments or contaminants to surface waters. Landscaped areas would be revegetated to the extent possible to permanently stabilize soils. The selected contractor would be required to implement and maintain approved construction temporary erosion and sediment control BMPs, spill response plan, and stormwater pollution prevention plan for the duration of construction. A designated staging,

refueling, and maintenance area would be designated for all heavy equipment, which would be situated at least 150 feet from surface waters. Given these design and construction elements, the potential for adverse impacts on water quality to occur from construction activities would be minimal. Therefore, the impacts to water quality from the Proposed Action would be **short-term, adverse, and low.**

Operational discharge of effluent may increase by up to 4 cfs relative to the No Action Alternative, but the effluent concentration would not increase. Average discharge from the hatchery into the Klickitat River is approximately 16 cfs, which is less than 2 percent of the average annual discharge of the Klickitat River. The hatchery would continue to comply with the current, applicable NPDES permit. This impact would be **long-term, adverse, and low**.

3.4.3 Environmental Consequences – No Action Alternative

3.4.3.1 Surface and Groundwater Quantity and Rights

Under the No Action Alternative, no construction actions would occur and there would be **no new impacts** to surface and groundwater quantity and rights. The Klickitat Hatchery would continue to use less than the allotted spring surface water allowed under existing authorization, including the certificate and permit and would have no ongoing impact to groundwater quantity and rights.

3.4.3.2 Water Quality

Under the No Action Alternative, no construction actions would occur and there would be **no new, short-term impacts** from construction to water quality. Ongoing activities at the Klickitat Hatchery such as effluent discharge entering the Klickitat River could have **long-term, adverse, low impacts** to water quality. Without the proposed improvements, the effluent from holding tanks discharged into the Klickitat River would meet the current NPDES permit's acceptable ranges of water quality parameters.

3.5 WETLANDS AND FLOODPLAINS

3.5.1 Affected Environment

In support of the proposed improvements, a formal delineation of wetlands and other waters of the U.S. was completed in May 2019. The delineation report was submitted along with a request for a jurisdictional determination from the USACE in September 2019 to determine where authorization under Section 404 of the CWA would be necessary (BPA 2019). The delineation study area was approximately 19.5 acres and included the Klickitat Fish Hatchery, land to the north of the river to include the Indian Ford A Spring pipeline, and a reach of the Klickitat River in between. These are the areas where the hatchery, spring intake, and pipeline construction actions would occur, but no work is proposed below the OHWM of the Klickitat River. The OHWM is the USACE jurisdictional limit for freshwater waterbodies.

The formal delineation identified several aquatic features within the study area (Figure 3-2). Features determined by the USACE as jurisdictional waters of the U.S. included two wetlands identified as

Wetlands A and B (0.16-acre and 0.001-acre, respectively), two tributaries to the Klickitat River which were Indian Ford A Spring and Rearing Pond 24 outfall (approximately 1,000 feet and 150 feet, respectively), and approximately 1,000 feet of the Klickitat River. Wetlands A and B are freshwater palustrine emergent and scrub/shrub wetlands with wetland vegetation species common to the region. The Klickitat River and Rearing Pond 24 outfall are fish bearing, perennial waters, and Indian Ford A Spring is a perennial, non-fish bearing water.

Non-jurisdictional, or excluded waters and features where authorization under Section 404 of the CWA would not be required, included the five constructed hatchery ponds identified as Rearing Pond 24 (0.03-acre), Hatchery Pond 25 (0.023-acre), Fish Ladder Hatchery Pond (0.023-acre), Pollution Abatement Pond (0.002-acre), and Adult Holding Pond (0.002-acre). The USACE Seattle District issued an Approved Jurisdictional Determination (NWS-2018-1136) in December 2019, valid for a period of five years, verifying the jurisdictional limits and status for these aquatic features (Appendix C).

A floodplain is a low-lying area of land located adjacent to, and shaped or influenced by, a river or stream. Natural floodplains often contain wetlands, improve ecological functions, and may provide flood risk reduction. The majority of the hatchery infrastructure, with the exception of the lower portions of the surface water pump station and hatchery fishway on the river-right bank, is located above the 100-year flood, or base flood, water surface elevation. Areas within the 100-year floodplain are classified as Zone A on the Federal Emergency Management Agency flood maps.

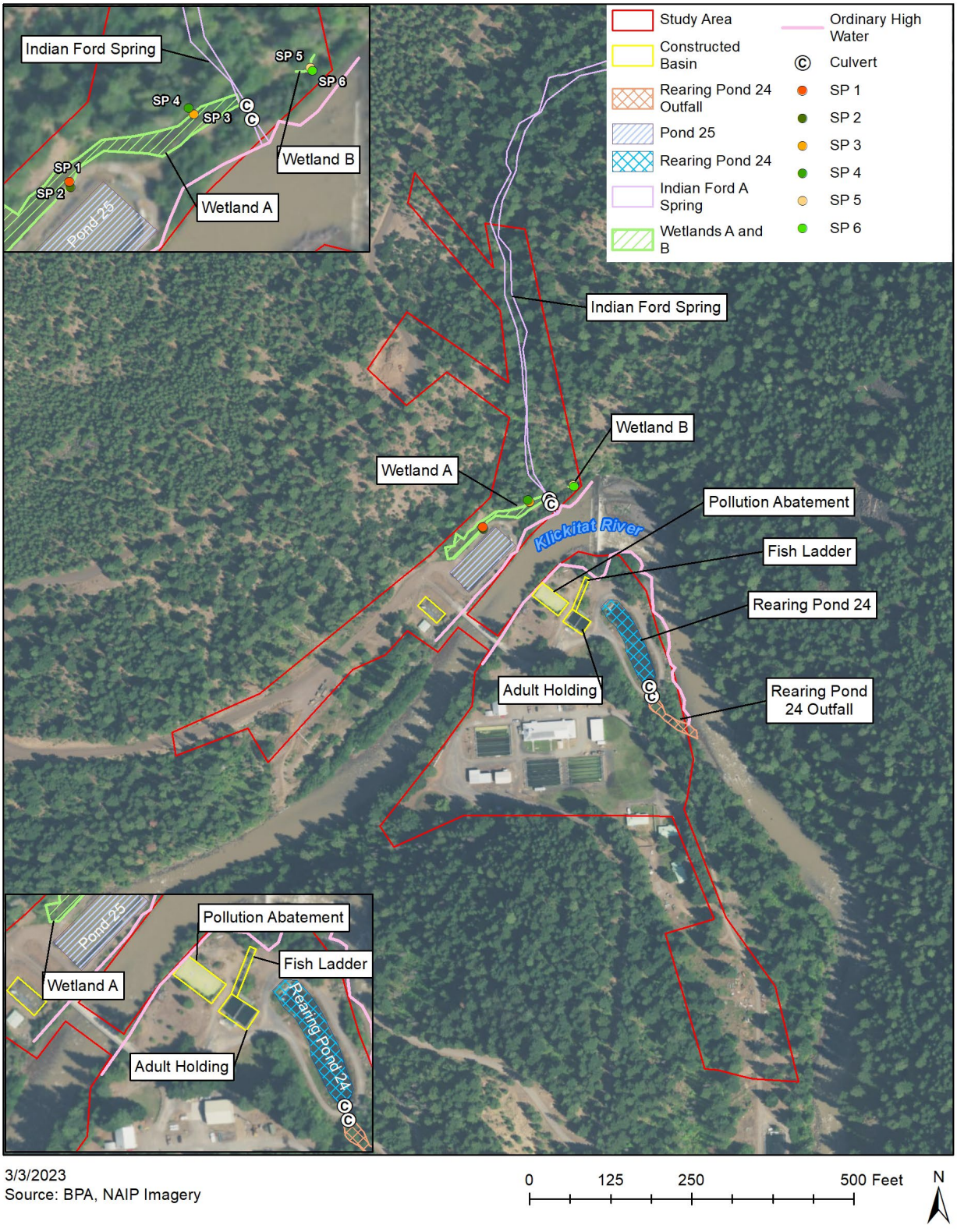


Figure 3-2. Wetland Delineation Map for Approved Jurisdictional Determination

3.5.2 Environmental Consequences – Proposed Action

No work, including filling/removal activities, would occur in wetlands as a result of the proposed construction actions. Ground disturbance during construction of the new 24-inch pipeline located adjacent to Wetlands A and B would be outside the wetlands, limited to the footings for saddle supports and thrust blocks as the pipe would be above-grade, and would not interrupt the wetland hydrology. BMPs, including the development and implementation of an SPCCP, would prevent sediment and potential contaminant spill migration into the wetlands during construction, and areas temporarily affected adjacent to the wetlands would be restored upon completion of the proposed construction activities. The Proposed Action would result in **no impacts** to wetlands.

Construction activities would temporarily impact waters at Indian Ford A Spring during the installation and removal of a sandbag cofferdam and dewatering necessary to demolish old structures and construct new water collection and control structures. Demolition and construction activities would occur landward of the OHWM. Construction BMPs for sediment containment, dewatering, and spill prevention and control would minimize the potential for impacts to adjacent waters and temporarily affected areas would be restored. No ground disturbing work would occur in the floodplain as a result of the proposed construction actions. The only work that would occur in the floodplain would be the rehabilitation of the existing surface water pump station, which would be limited to in-kind replacement of parts and recoating surfaces. No new net fill would be placed in the floodplain as a result of the Proposed Action. Thus, the Proposed Action would result in **no impacts** to the floodplain.

3.5.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur and there would be **no impact** to wetlands and no new impacts to the floodplain. Klickitat Hatchery operations do not impact wetlands within the project vicinity and floodplains; therefore, there would be no ongoing impacts to these resources under the No Action Alternative.

3.6 FISH

3.6.1 Affected Environment

Anadromous fish in the Klickitat River are present as both naturally produced (wild) and artificially produced (hatchery) populations as some species, such as coho and fall Chinook, were not historically present or naturally abundant in the Klickitat subbasin. Natural populations of anadromous fish, which once supported a rich tribal fishery in the early 20th century, but have declined for decades in the Klickitat subbasin due to multiple, ongoing threats including commercial harvests, climate change, dam and reservoir projects, hatchery operations, competition and predation, and declining habitat conditions (NMFS 2009).

According to the Statewide Washington Integrated Fish Distribution (SWIFD) dataset, which displays fish distribution data for anadromous and resident fish mapped by the Washington Department of

Fish and Wildlife, numerous fish species have been documented in the Klickitat River in the vicinity of the hatchery (Table 3-5).

Table 3-5. SWIFD Fish Species and Runs Documented in the Klickitat River in the Vicinity of the Hatchery

Common Name	Scientific Name	Run	ESA Status
Middle Columbia River ESU[1] Chinook salmon	*Oncorhynchus tshawytscha*	Spring	Not listed
Hatchery origin[2] URB[3] Chinook salmon	*O. tshawytscha*	Fall	Not listed
Columbia River DPS bull trout	*Salvelinus confluentus*	n/a	Threatened
Rainbow trout (resident)	*O. mykiss*	n/a	Not listed
Middle Columbia River DPS[4] steelhead trout	*O. mykiss*	Winter, summer	Threatened
Coastal cutthroat trout	*O. clarkii*	n/a	Not listed
Hatchery origin[2] coho salmon	*O. kisutch*	n/a	Not listed

[1]ESU – Evolutionarily Significant Unit, [2]Natural-origin fall Chinook and coho salmon also spawn in the Klickitat River but were not identified in SWIFD in the vicinity of the hatchery (Allen 2022), [3]URB – Upriver Bright, [4]DPS – Distinct Population Segment
Source: WDFW 2018

Pacific lamprey (*Entosphenus tridentatus*) are also known to occur in the Klickitat River subbasin, but historical and present distribution and abundance is largely unknown (Yakama Nation and WDFW 2008). Spring Chinook are native to the Klickitat subbasin.

Two ESA-listed fish species can be found within the project vicinity, including the threatened Columbia River (CR) bull trout, and the threatened Middle Columbia River (MCR) steelhead. Bull trout occurrence in the mainstem Klickitat below the West Fork Klickitat confluence (RM 63) is rare, and the fish are thought to exist mostly as a resident population of the West Fork and may occur in greater abundance in the upper drainage where habitat is more favorable. CR bull trout may use the mainstem Klickitat River in the vicinity of the hatchery for migration. Overall, little information is known about their life history in the Klickitat River (BPA 2011). Both summer and winter runs of MCR steelhead are native to the Klickitat subbasin and are considered by WDFW as a stock maintained by natural production (WDFW 2002, as cited in BPA 2011). In the vicinity of the hatchery, summer and winter MCR steelhead may be present in the mainstem Klickitat River during migration, rearing, and spawning. The mainstem Klickitat River downstream from the hatchery, from RM 11 to RM 42, is considered one of the key steelhead spawning areas for hatchery stock and wild fish (BPA 2021).

Critical habitat has been designated for CR bull trout and occurs within the mainstem Klickitat River, including the hatchery reach. MCR steelhead designated critical habitat also occurs within the

mainstem Klickitat River, including the hatchery reach. The Klickitat River subbasin has also been designated as Essential Fish Habitat (EFH) as defined by the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq.*) for Chinook and coho salmon species managed under the Pacific Coast Salmon Fishery Management Plan (PFMC 2022). Habitat in the vicinity of the hatchery, between RM 42 and RM 44, is characterized primarily by a swift current and turbulent flow with limited pools or holding habitat. Due to these turbulent conditions, fish are likely to use this river stretch to pass through the area, but not for holding or spawning.

To help ensure that anadromous fish abundance in the Klickitat subbasin is adequate and sustainable over time to meet the needs of subsistence, ceremonial, commercial, and sport fishermen, the Yakama Nation maintains hatchery facilities in cooperation with WDFW for artificial production and supplementation of natural anadromous fish populations. Additionally, the Yakama Nation continually monitors the quality and quantity of available habitat and uses those data to implement habitat restoration actions within the historical ranges of anadromous fish populations (Yakama Nation and WDFW 2008). The Yakama Nation estimates the Klickitat spring Chinook run comprises approximately 75 percent hatchery fish and 25 percent natural fish on average (Yakama Nation 2018). By analyzing PIT tag data, the Yakama Nation identified that smolt survival from release to Bonneville Dam is a limiting factor for spring Chinook population success (Yakama 2018).

3.6.2 Environmental Consequences – Proposed Action

Potential impacts to fish include temporary effects to behavior and distribution in the mainstem Klickitat River due to general disturbances from the construction of the proposed improvements adjacent to the existing streambanks. Construction noise above background levels would be temporary and greatly attenuated upon entering the water column. Displacement of juvenile and adult fish from the river areas near the hatchery, should they occur in the area, would be for a short duration and would not impact their use of the river in the vicinity of the hatchery over the long term. No instream work in the mainstem Klickitat River would occur during the proposed improvements, and therefore, no modifications to aquatic habitat would occur due to construction. Minor increases in turbidity due to upland soil disturbances and the addition of graveled surfaces may occur should sediments migrate beyond the temporary erosion and sediment control BMPs. Such increases would be temporary and localized, and would not be expected to increase turbidity and suspended sediment levels in the river to levels harmful to fish. The approved SWPPP would require turbidity monitoring and record keeping to ensure turbidity concentrations are maintained within allowable limits of background concentrations. No fish mortality would be expected to result from construction of the proposed improvements. Considering these potential consequences, the Proposed Action is anticipated to result in **short-term, adverse, low impacts** to fish.

To comply with the ESA, BPA is drafting a Biological Assessment, consulting with NMFS for the protected species discussed in this section, and consulting with USFWS for protected bull trout. With implementation of the measures described above, impacts on ESA-listed fish, designated critical habitat, or EFH would be low. Any additional measures resulting from consultation to reduce impacts to ESA-listed species would be implemented as part of the Proposed Action.

In the HGMP, the Yakama Nation indicates that the hatchery must produce and release approximately 800,000 spring Chinook smolts annually to meet conservation and harvest objectives, which is an increase of 200,000 smolts from current levels. The Yakama Nation anticipates an increased recruit performance for both hatchery program fish and natural production following the transition to an integrated program supported by the proposed facility upgrades (Yakama Nation 2018; Hess et al. 2011). Based on analysis completed by Yakama Nation for the latest HGMP revisions, the increase in production and release of spring Chinook smolts that would result from increased hatchery capacity is anticipated to increase the viability of the natural fish population in the Klickitat River (Yakama Nation 2018). The Proposed Action would facilitate implementation of the Yakama Nation's Spring Chinook Master Plan, which is considered to produce long-term benefits for the spring Chinook population in the Klickitat River Subbasin (Yakama Nation 2018; Hess et al. 2011). The hatchery upgrades support an increased proportion of natural-origin broodstock that was determined by the Master Plan to be necessary to meet long-term harvest objectives (Yakama Nation 2018).

3.6.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no** change in current operations. Without the implementation of the proposed improvements, the hatchery would not transition to an integrated program. Genetic issues and low hatchery productivity would continue to challenge the Yakama Nation's ability to meet biological and harvest objectives for the spring Chinook hatchery program (Yakama 2018).

3.7 WILDLIFE

3.7.1 Affected Environment

The project area vicinity provides high quality habitat for a variety of species due to mature fir and ponderosa pine forests and relatively high species richness and spatial and temporal vegetative diversity. Based on information obtained from the U.S. Fish and Wildlife Service (USFWS) and a survey conducted in 2018 by a Yakama Nation biologist (Nuetzmann 2018), 10 species listed as threatened or endangered under the ESA, or otherwise special-status species, may occur in Yakima and Klickitat counties and possibly in proximity to the project area (Table 3-6).

Table 3-6. Special-Status Species that May Occur in the Project Area.

Species	Federal Species Status	Critical Habitat
Mammals		
Gray wolf (*Canis lupus*)	Endangered	Designated, but not in the project area
Canada lynx (*Lynx canadensis*)	Threatened	Designated, but not in the project area
North American wolverine (*Gulo gulo luscus*)	Proposed Threatened	No designated critical habitat
Birds		
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	Designated, but not in the project area
Northern spotted owl (*Strix occidentalis caurina*)	Threatened	Designated, but not in the project area
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	Designated, but not in the project area
Cassin's finch (*Carpodacus cassinii*)	Bird of Conservation Concern	No designated critical habitat
Evening grosbeak (*Coccothraustes vespertinus*)	Bird of Conservation Concern	No designated critical habitat
Olive-sided flycatcher (*Contopus cooperi*)	Bird of Conservation Concern	No designated critical habitat
Amphibians		
Oregon spotted frog (*Rana pretiosa*)	Threatened	Designated, but not in the project area

Source: Nuetzmann 2018

3.7.1.1 Species Excluded from Further Consideration

The marbled murrelet, an ESA-listed (threatened) bird, nests in mature forest stands within 50 miles of the coast. Since the project area is much more than 50 miles from the coast, there is no suitable habitat within the project vicinity and this species will therefore not be discussed further in this EA.

The Canada lynx, an ESA-listed (threatened) mammal, primarily inhabits subalpine fir forests in elevations higher than 4,600 feet (WDFW 2022a). The project vicinity is much lower in elevation (approximately 1,250 feet) and does not accumulate enough snow in the winter to provide suitable habitat. For these reasons, this species will not be discussed further in this EA.

The yellow-billed cuckoo, an ESA-listed (threatened) bird, has a strong preference for riparian zones with cottonwoods and willows and can be found nesting in fir woodlands. However, according to WDFW, there have only been 20 sightings of this species in the State of Washington since the 1950s at

a rate of one sighting every 2.3 years. These sightings were likely migrants, indicating that cuckoos are functionally extirpated in the state (WDFW 2022b).

3.7.1.2 Special-Status Species

The northern spotted owl has the potential to occur within the vicinity of the project area. This species prefers older-forested habitats with moderate to high canopy closure and large overstory trees, which are found in the vicinity of the project area. Additionally, based on WDFW northern spotted owl mapping data from 2021 and a survey conducted by Yakama Nation in 2018, an active northern spotted owl nest site was found 1.62 miles southeast of the project area, within the designated 1.8-mile regulatory range for northern spotted owls in the Washington Cascades province (WDFW 2021; Nuetzmann 2018; Figure 3-3). Suitable northern spotted owl foraging and dispersal habitat and potentially winter roosting habitat can be found north and upslope of the Klickitat Hatchery bridge (Nuetzmann 2009; BPA 2011). USFWS has designated critical habitat for the northern spotted owl, but it is not found within the project area.

The gray wolf also has the potential to occur within the vicinity of the project area. This ESA-listed (endangered) species can inhabit a wide range of habitat types including temperate forests, mountains, and grasslands. There are no known wolf packs within the project vicinity and the nearest pack, the Teanaway pack, is a linear 84 miles northeast of the project area. Tribal members have reported sightings of gray wolves across the Yakama Nation Reservation, but their presence has not been confirmed (Nuetzmann 2009). In 2011, a wolf sighting occurred about 17 miles east of the project area in Lakebeds Meadows (Nuetzmann 2018). The most recent nearby wolf sighting occurred in April 2022, where two wolves were spotted in "Northern Klickitat County," according to WDFW, although their specific location was not released (WDFW 2022c).

The Oregon spotted frog, an ESA-listed (threatened) amphibian, has the potential to occur within the vicinity of the project area. This species inhabits wetland and riverine habitat types. The nearest sighting was only 0.7 mile southeast of the hatchery boundaries (USFWS 2021).

The North American wolverine, a mammal proposed for ESA-listing, prefers high elevation habitats within the Cascades from northeastern Washington south to Mount Adams in the Gifford Pinchot National Forest. The population closest to the project area is small and likely consists of no more than 25 individuals (WDFW 2022d). Although wolverines have not been sighted on the grounds of the Klickitat Hatchery, it is possible for them to migrate through the area.

State priority species that have been observed by tribal biologists include the northern goshawk (*Accipiter gentilis*), flammulated owl (*Psiloscops flammeolus*), Lewis' woodpecker (*Melanerpes lewis*), pileated woodpecker (*Dryocopus pileatus*), Vaux's swift (*Chaetura vauxi*), big-brown bats (*Myotis* sp.), and mule deer (*Odocoileus hemionus*) (Nuetzmann 2022). State-listed species that have not been directly observed but have the potential to occur due to the existing habitat types within the project vicinity include the northwestern pond turtle *(Actinemys marmorata),* western gray squirrel (*Sciurus griseus*), greater sage grouse *(Centrocercus urophasianus*), Larch Mountain salamander *(Plethodon larselli*), and the Mardon skipper *(Polites mardon*) (WDFW 2022e).

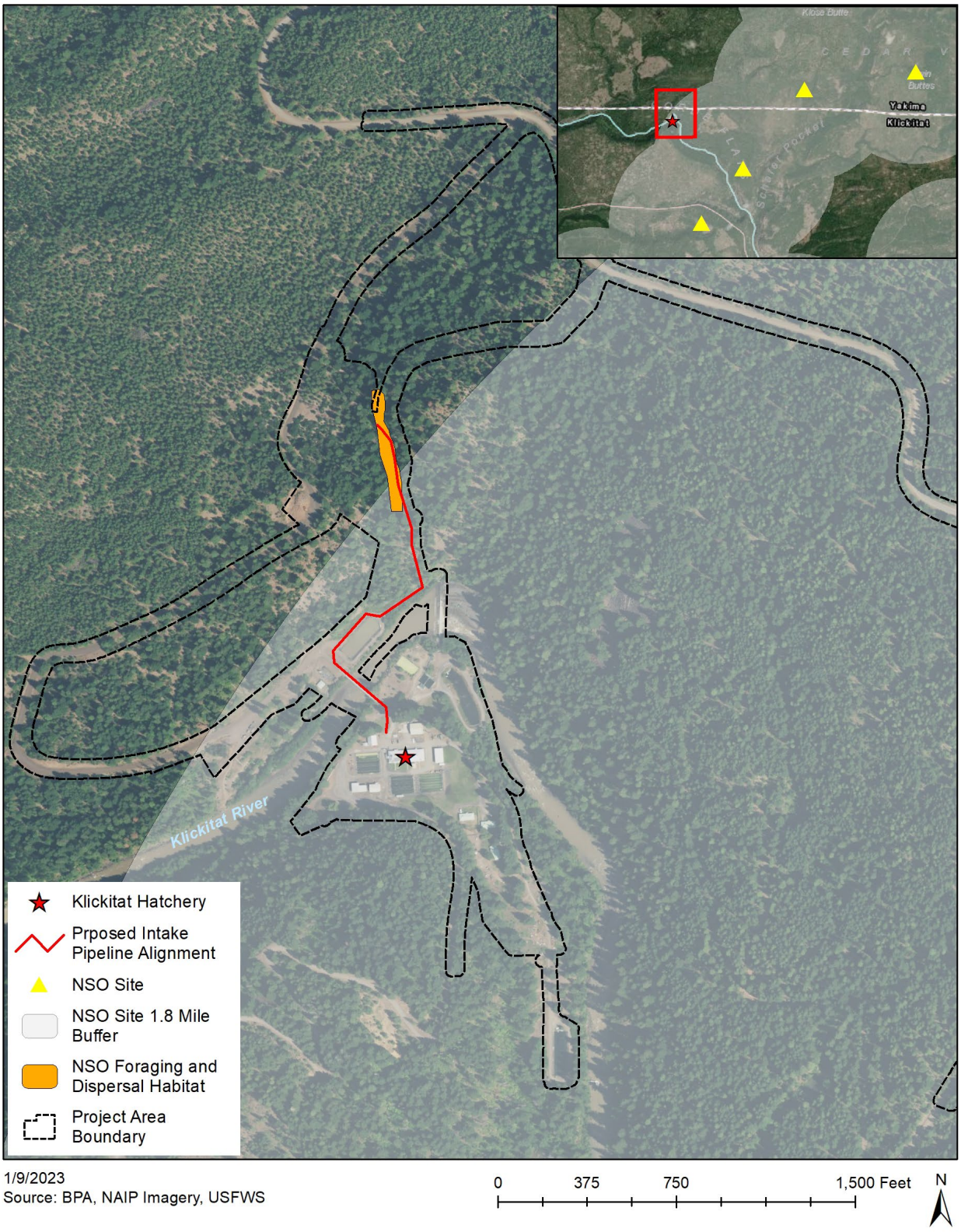


Figure 3-3. Northern Spotted Owl (NSO) Nests, Habitat, and Regulatory Range in the Project Vicinity.

3.7.1.3 Common Species

Wildlife species with no state or federal status observed by tribal biologists within the project vicinity include the rough-skinned newt, coastal tailed frog, western toad, Pacific tree frog, Cascades frog, black bear, coyote, elk, bobcat, striped skunk, river otter, mountain goat, Douglas squirrel, northern flying squirrel, Townsend's chipmunk, porcupine, bushy tailed woodrat, snowshoe hare, pika, rubber boa, gopher snake, and garter snake. Numerous bird species have also been observed, including sharp-shinned hawk, Cooper's hawk, red-tailed hawk, blue grouse, hairy woodpecker, northern red shafted flicker, several jay and songbird species, raven, bald eagle, golden eagle, killdeer, spotted sandpiper, common nighthawk, wild turkey, and belted kingfisher (Nuetzmann 2009).

3.7.2 Environmental Consequences – Proposed Action

3.7.2.1 Special-Status Species – Federally Listed Species

Many migratory species would avoid the project vicinity during construction activities due to increased noise and human activity. The gray wolf and North American wolverine, for example, do not permanently inhabit the project vicinity but may migrate through the area. These species would likely avoid the project area during construction activities. Displacement of these species would be temporary and thus, would be a short-term low impact.

The Oregon spotted frog may occur in wetland habitats within the project area, but these areas would be avoided during construction activities, and there would be no impacts to this species.

The northern spotted owl may forage and nest within the project vicinity. Construction noise, increased human activity, and tree and vegetation removal has the potential to injure or displace this species. However, construction BMPs would be used to prevent or minimize such impacts, including avoiding vegetation and tree removal during the nesting season, minimizing construction noise during the nesting season, and limiting construction noise with sound-control devices as much as possible. The steep topography and dense vegetation surrounding the project area would act as a sound buffer to reduce the extent of construction noise impacts. All these measures would ensure there are no-to-minimal impacts to the northern spotted owl.

To comply with the ESA, BPA is drafting a Biological Assessment and consulting with USFWS for the protected species discussed in this section. Any additional measures to reduce impacts to ESA-listed species would be implemented as part of the Proposed Action. In general, the Klickitat Hatchery does not provide high quality wildlife habitat due to the moderate level of human activity, the lack of plant species richness, and the lack of structural diversity.

The facility upgrades would not substantially change existing conditions, indicating that any adverse impacts to wildlife would be short-term. The increase in salmon in the Klickitat River system would likely result in increased nutrient cycling throughout the food web, benefiting scavenging and foraging wildlife such as bears and wolves. The Proposed Action would have **short-term, adverse, low impacts** and **long-term, beneficial, low impacts** to ESA-listed wildlife species.

3.7.2.2 Special Status Species - State Priority Species

The flammulated owl, northern goshawk, Vaux's swift, Lewis' woodpecker, and pileated woodpecker have all been observed by tribal biologists in the project area and inhabit mid- to late-seral coniferous fir and ponderosa pine forests indicating their preferred habitat can also be found within the project area. Small trees and shrubs would be removed along the spring intake access road and the new spring intake pipeline; however, vegetation in these areas is made up of small trees (less than 6-inch diameter) and does not provide high quality habitat or nesting habitat. Up to five large (6-inch diameter or greater) trees would be removed along the spring intake pipeline, although trees that have the potential to provide nesting habitat would be avoided. Tree removal would also take place in the fall and winter to avoid displacement or injury during nesting season. Construction BMPs would be followed to reduce potential impacts to these species including a revegetation plan and a SPCCP. Noise resulting from construction activities also has the potential to disperse these species, but this impact would be short-term and low.

Brown bats have also been observed in the project area and prefer trees, snags, caves, and bridges in forests, rangelands, or urban areas for roosting habitat (WDFW 2022f). Small tree removal under the Proposed Action is unlikely to affect suitable roosting habitat. The contractor would coordinate with BPA and Yakama Nation biologists to inspect any large trees for potential nesting and roosting habitat prior to removal. With implementation of appropriate conservation measures, the impact to this species would be none-to-low.

Mule deer have been observed in the project area and rely on a variety of habitat types. Mule deer can be found migrating through coniferous forests to take advantage of high-quality forage in the summer growing season (WDFW 2022f). Vegetation removal along the spring intake access road and pipeline installation would take place in the fall and winter months indicating mule deer displacement or injury impacts would be none-to-low. During construction, increased noise and human activity would likely deter mule deer and potentially disperse this species. This would likely decrease the potential for injury and the dispersal impact would be short-term and low.

Western gray squirrels have not been observed in the project area; however, they have the potential to occur in the vicinity. This species relies on oak, pine, and fir forest habitat types and reproduces from March to June (WDFW 2022f). Tree removal and vegetation disturbance along the spring intake access road and new pipeline installation would take place in the fall and winter to avoid potential injury or displacement. Adult and juvenile squirrels would likely avoid the construction area due to increased construction-related noise. These impacts would be low and short-term.

Additional State priority or State-listed species that have not been observed in the project area include the mardon skipper, Larch Mountain salamander, northwestern pond turtle, and the greater sage grouse. The mardon skipper can be found in glacial outwash prairies and montane meadows above 1,800 feet in elevation; therefore, this species would not be found in the project vicinity (WDFW 2022f). The Larch Mountain salamander is lungless and spends the majority of the year underwater (WDFW 2022f). The project area lacks natural year-round ponded habitat, and this species has not been found in Klickitat or Yakima counties, so it would not likely occur in the project area. The

northwestern pond turtle only inhabits ponds and lakes within the State of Washington, which do not occur within the project area, so this species would not occur in the project area. The greater sage grouse inhabits the sagebrush steppe ecosystem, which is not found within the project area. Additionally, the species' current geographic range does not extend into Klickitat County, so the Proposed Action would not affect this species (WDFW 2022f).

The increased production and release of salmon smolts could increase food availability for state priority species such as raptors. Therefore, the Proposed Action would have **short-term, adverse, low impacts** and **long-term, beneficial, low impacts** to special-status, specifically state priority, species.

3.7.2.3 Common Species

Potential impacts to common wildlife species resulting from the construction of the proposed improvements include injury or displacement due to construction equipment and noise. Impacts from construction could result from accidental fuel and oil tank leaks, and improperly disposed stormwater which could cause damage to vegetation and wildlife. Such impacts would be long-term, but BMPs would be followed to reduce the potential for such disturbances. Construction BMPs such as the implementation of an SPCCP, prohibiting discharge of vehicle wash water into any stream or water body, implementation of a revegetation plan to restore wildlife habitat, and maintaining clean work areas with proper litter control to prevent wildlife attraction would all reduce the severity of potential construction-related impacts. During vegetation removal on the upper and lower spring intake access road, installation of the new pipeline from the spring intake, and the potential addition of two residences, common wildlife species, could be temporarily displaced or injured. The selected contractor would coordinate with BPA and Yakama Nation biologists to identify and avoid removal of suitable nesting trees during bird nesting season to minimize injury and displacement of nesting birds. Vegetation removal at the two optional residences covers a small area of approximately three acres, which contains primarily invasive species and noxious weeds with some interspersed Douglas-fir trees. The removal of vegetation and potential general wildlife habitat, with the addition of the two residences, would occur on a small scale and the impact would be low. Construction noise also has the potential to displace general wildlife, but BMPs would reduce these effects. The increased production and release of salmon smolts could increase food availability for common wildlife species and create a beneficial effect. The Proposed Action would have **short-term, adverse, low impacts** and **long-term, beneficial, low impacts** to common wildlife species.

3.7.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no new impacts** to wildlife. Ongoing impacts from noise associated with the hatchery and human presence would continue to result in low impacts to wildlife.

3.8 RECREATION

3.8.1 Affected Environment

Recreation opportunities within a 15-mile radius of the Klickitat Hatchery include fishing, rafting, hunting, hiking, and wildlife observation. Tours of the Klickitat Hatchery are available to the public (Yakama Nation 2006). Private and commercial white water rafting is a common activity on the stretch of the Klickitat River surrounding the hatchery, especially from April to June (Whitewater Guidebook 2022). Recreational boaters also kayak or float the river during the summer and fall months.

The Yakama Nation manages the forested lands surrounding the hatchery facilities in accordance with its Forestry Management Plan, which states that "traditional use at traditional camping, hunting, fishing, gathering, spiritual, and ceremonial areas will be reserved for Yakama Nation members with the exception of Tract D Recreation Area" (Yakama Nation 2005). The plan also prioritizes the preservation of existing primitive or semi-primitive settings that provide opportunities for solitude and other recreational benefits.

Thirty percent of the total harvest objective for spring Chinook in the Klickitat River is intended for sport or recreational fishing. The combined sport and tribal harvest of spring Chinook within the Klickitat subbasin averaged 894 fish annually from 1996 to 2005 (Yakama Nation 2018). Harvest levels are monitored, and sport fishermen are required to release wild fish throughout the Klickitat subbasin (Yakama Nation 2018). In-river harvest occurs in the lower river recreational fishery and in the tribal dip net fishery at Lyle Falls (Yakama Nation and WDFW 2008).

3.8.2 Environmental Consequences – Proposed Action

The Proposed Action is anticipated to have beneficial impacts on recreational fishing for members of the Yakama Nation as well as sport fishermen harvesting spring Chinook in the subbasin. The proposed improvements are intended to provide greater harvest benefits while reducing potential impacts to natural Chinook populations (Yakama Nation 2018). If successful, the increased production supported by the proposed upgrades would yield an average annual harvest of 1,200 spring Chinook for sport or recreational purposes in the Klickitat River (Yakama Nation 2019).

Construction activities could temporarily disrupt recreational access to rafters launching boats immediately next to the hatchery facilities. Additional launch sites exist upstream (Parrot's Crossing) and downstream (Summit Creek Bridge) from the hatchery (Sharp 2022b). River navigation would not be impeded at any time since no in-water work would occur in the Klickitat River. To the extent feasible, BPA would notify known recreational entities and post notices onsite regarding anticipated disruptions to boat launch access, if any. Proposed activities are recommended to occur when water levels are lowest, outside of the primary rafting season of early spring to summer. No changes to nearby rafting put-ins or access points for sport fishing outside Yakama Nation Reservation boundaries would occur. With the implementation of avoidance and minimization measures, the Proposed Action would likely have **short-term, adverse, low impacts** on recreational use of the river within the immediate project vicinity. In addition, the Proposed Action would result in increased

capacity for fish production and release, which would have **long-term, beneficial low impacts** to recreational fishing due to increased stocks.

3.8.3 Environmental Consequences – No Action Alternative

No changes to access to recreational opportunities would occur under the No Action Alternative and therefore would result in **no short-term impacts** to recreation. Current production rates and harvest goals for spring Chinook would continue under the existing hatchery management plan. Without any facility improvements, long-term recreational harvest goals may not be reached due to ongoing low hatchery productivity. The No Action Alternative may have **adverse, moderate impacts** on the Klickitat River's recreational fishery in the **long term**.

3.9 HISTORIC AND CULTURAL RESOURCES

3.9.1 Affected Environment

Cultural resources include precontact and historic archaeological sites, districts, and objects, historic structures and buildings, and traditional cultural properties, or places that may or may not have human alterations but are important to the cultural identity of a community or Indian tribe.

The entire project area is located on the Yakama Nation Reservation, which was established by the Treaty of 1855 (12 stat. 951) between the Yakama Nation and the United States government and encompasses nearly 2,200 square miles bounded by the Cascade Mountains, Simcoe Mountains, Yakama River, and Ahtanum Creek. Hunting areas, burials/cemeteries sites, petroglyphs, fishing sites, and gathering sites remain throughout the Klickitat drainage basin. Traditionally, people living in this area obtained resources through a practice of seasonal subsistence activities including salmon fishing, gathering, and hunting.

The Yakama Nation conducted three inventories of historic and cultural resources within the project area, encompassing proposed access routes, staging areas, and construction zones, in 2011, 2018, and 2022. One structure within the project area, the original fish hatchery building, is eligible for listing on the NRHP. No major alterations have been made since its construction, but minor modifications and improvements have been made to the interior.

Tribal archaeologists identified additional, potentially eligible cultural resources within the survey limits associated with use of the project area by members of the Yakama Nation and their ancestors. Resources within the project area remain in their original locations with little evidence of alterations.

3.9.2 Environmental Consequences – Proposed Action

Proposed modifications to the existing hatchery building include interior updates to increase energy efficiency, comply with the ADA, and improve usefulness of indoor office and meeting spaces for hatchery staff. No exterior modifications that would compromise the building's historical architectural integrity are planned. All proposed work would be coordinated with the Yakama Nation's Tribal Historic Preservation Office to ensure compliance with all applicable laws and regulations.

The selected contractor would coordinate with the Yakama Nation to avoid any cultural resources identified within the project area during staging and construction. All construction activities would be conducted under the BMPs listed in Section 2.4 and the contractor would be required to have an inadvertent discovery plan in place to stop work and assess any potential cultural resources unearthed during ground-disturbing activities. For these reasons, project work would result in **no-to-low, long-term, adverse impacts** on historic and cultural resources. Additionally, increased salmon production in the Klickitat River fishery associated with the hatchery upgrades may benefit traditional subsistence practices in the region.

3.9.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no modifications would be made to the Klickitat Hatchery so there would be **no impact** on any existing historic or archaeological resources. Since there would be no increase in salmon production, tribal ceremonial and subsistence use of this traditional cultural resource would likely be unchanged from current conditions.

3.10 AIR QUALITY

3.10.1 Affected Environment

Air quality standards are regulated by federal, state, and tribal agencies to prevent air pollution from causing harm to public health and the environment. The Yakama Nation protects air quality within the Yakama Nation Reservation boundaries with technical assistance from the Environmental Protection Agency (EPA) in accordance with the Federal Air Rules for Indian Reservations (FARR). The Washington Department of Ecology (Ecology) and Yakima Regional Clean Air Agency regulate air quality in the airsheds neighboring the Yakama Nation Reservation in accordance with Washington Ambient Air Quality Standards to provide clean air to the public.

According to recent nonattainment and maintenance status reports, the project area and surrounding vicinity have good air quality and are in attainment for all criteria pollutants identified by the EPA and State of Washington. There are no nonattainment areas within the vicinity of the project area; however, Yakima, Washington, located approximately 70 miles away, is actively monitored for and in maintenance for carbon monoxide and PM_{10} (EPA 2022a).

The project area is in a remote, undeveloped area with little to no pollutant emissions. Sources of potential pollutants in the area include vehicle emissions on nearby highways, wood burning heating sources in residential areas, and road dust from unmaintained roadways. The largest factor affecting air quality in the project vicinity is the occurrence of forest fires, which have the potential to increase $PM_{2.5}$. Forest fires occur in the dry summer and early fall months and can cause a temporary increase in air quality pollutants, as well as public health concerns.

3.10.2 Environmental Consequences – Proposed Action

Under the Proposed Action, the use of heavy machinery during construction would result in minor diesel emissions and generation of dust. This increase in pollutants would be temporary and would not be of sufficient quantity to exceed any applicable air quality standards. The Proposed Action

would apply construction BMPs such as minimizing the area of soils exposed and using dust abatement measures to reduce the potential for fugitive dust and air pollutants. The construction contractor would comply with all FARR regulations concerning air pollution control. There are no sensitive receptors within the project vicinity, and the Proposed Action would result in **short-term, adverse**, **low impacts** to air quality.

3.10.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and **no new impacts** to air quality would be expected, but ongoing impacts from other actions such as vehicle emissions and wood burning would continue.

3.11 GREENHOUSE GASES AND CLIMATE CHANGE

3.11.1 Affected Environment

Greenhouse gases (GHGs) are chemical compounds that absorb and trap infrared radiation, or heat, in the atmosphere. The trapping of these compounds creates a greenhouse-like effect that may result in increases in the overall atmospheric temperature (U.S. Environmental Protection Agency [EPA] 2022b), although regional geographic variation in temperature and precipitation may vary. The emission of GHGs such as carbon dioxide, methane, nitrous oxide, and fluorinated gases can be naturally occurring or human caused. Human activities, such as the burning of fossil fuels for electricity, heat, and transportation, have in recent decades accelerated GHG abundance at rates greater than historical increases. One projection of global temperature change is estimated as an increase of up to 9.7° Fahrenheit by the end of the twenty-first century (National Oceanic and Atmospheric Administration [NOAA] 2022). Other studies suggest increases in global temperatures and resulting climate change may lead to increased sea level, changes in the frequency, intensity, and duration of extreme weather events, and ecosystem changes (EPA 2022b).

The State of Washington's annual GHG emissions in 2018 were reported as 99.6 million metric tons, with the majority of the emissions resulting from transportation sources (Ecology 2021). The Klickitat Hatchery, under normal operations, does not produce large amounts of GHGs; its only emission sources are from wood-burning fireplaces in its nearby residences, a propane furnace to heat the hatchery buildings, and vehicle emissions that occur during transportation activities.

3.11.2 Environmental Consequences – Proposed Action

Under the Proposed Action, the use of gasoline- and diesel-fueled construction equipment would result in a temporary increase in greenhouse gas emissions. These adverse impacts would be low and short term and would not be considered a large enough impact for EPA reporting (EPA 2022c). Construction BMPs, such as the use of alternative fuels or electrical power where appropriate, would be used to reduce potential emissions and adverse impacts. The project designs include measures to reduce GHG emissions and include water conservation practices, such as the reuse of water in various locations in the hatchery that would provide the facility with long-term security in the face of increasing air temperatures and unpredictable water years. Water from raceways A, B, and C would

provide reuse water to the adult holding facilities and the circular rearing tanks. Additionally, the use of gravity-fed systems in the pollution abatement pond reduces the number of pumps required, which results in reduced energy consumption and reduced emissions.

Chinook salmon food sources, populations, and behavior may be adversely affected by climate change effects such as decreased reliability of water, increasing global temperatures, and increases in invasive and exotic vegetation and wildlife species (Finch et al. 2021; NAISMA 2021). The additional salmon smolts being produced and released each year under the Proposed Action are likely to increase the survivability and fitness of the Chinook salmon population. Furthermore, the circular tanks would benefit the Chinook broodstock by increasing the fitness of hatchery-reared fish through the increased exercise exhibited in the current provided by circular tanks (Columbia River Inter-Tribal Fish Commission [CRITFC] 2022), and this is likely to increase their survival to maturity. This may, in turn, reduce genetic divergence between hatchery-reared and wild salmon. The project designs would also equip the hatchery with systems that counteract temperature-induced stress by improving the spring water intake system. The Proposed Action would result in a **short-term, adverse, low impact** to greenhouse gases and climate change during construction, but may create **long-term, beneficial, low impacts** to salmon and other organisms that have the potential to be impacted by climate change. This facility is likely to increase resiliency of the native Chinook salmon population in a changing climate through its improved hatchery operations.

3.11.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no new impacts** to greenhouse gases and climate change. Ongoing impacts to greenhouses gases and climate change due to use and operation of the Klickitat Hatchery such as vehicle emissions, emissions from wood-burning fireplaces in the residences, and emissions from a propane furnace used to heat the hatchery buildings would continue. The current rate of salmon production would persist, which would not help contribute to increased resiliency of the native Chinook salmon population in a changing climate.

3.12 VISUAL QUALITY

3.12.1 Affected Environment

The Klickitat Hatchery is in a rural area, and the land surrounding the facility is undeveloped forested land. The hatchery itself consists of the main building, three residences, a generator building, freezer building, energy building, concrete rearing ponds, rearing raceways, a shed, and various storage facilities. The views of the surrounding area include the Klickitat River and hillsides with various riparian and mixed deciduous, coniferous forest vegetation. The overall aesthetic of the project vicinity is woodland and rural.

The pictures below display the views and visual quality of the Klickitat Hatchery and surrounding area. The image on the left displays views of the Klickitat River from the Klickitat Hatchery bridge facing northeast. The image on the right displays the adult holding ponds within the hatchery facing east.


Figure 3-4. Views of the Klickitat River and Hatchery Facilities.

3.12.2 Environmental Consequences – Proposed Action

Under the Proposed Action, there would be **short-term, adverse, moderate** impacts to visual quality during construction activities. Clearing of vegetation, grading, and construction of hatchery facilities would be visible throughout the project area and would create a short-term impact to visual quality. The proposed project footprint is only slightly larger than the existing facilities and would include new circular raceways in the northeast section of the project area, the replacement of the adult holding facility, a retaining wall around the circular raceways and pollution abatement pond, construction of the spawning facility, the distribution box, and the fishway, as well as two optional residences in the southeast end of the project area. The 5-foot tall retaining wall would be visible from the river and would create a visual impact to people recreating on the Klickitat River. The wall's aesthetic would remain consistent with the surrounding structures and therefore, the impact would be low. The other new structures would cause a slight change to the visual quality compared to existing conditions, but the project area overall would remain consistent with the existing rural and surrounding woodland aesthetic. The impacts to visual quality would be **long-term, adverse, but low.**

3.12.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no new impacts** to visual quality. Ongoing hatchery actions would continue to occur.

3.13 NOISE

3.13.1 Affected Environment

Klickitat Hatchery is a fully operational facility presently supporting the breeding, rearing, and holding of three species of fish. Regular vehicle traffic and use of heavy machinery, generators, and water pumps contribute to ambient noise levels within the facility. The full project area is at the end of a long, unimproved road and surrounded by forested habitat.

3.13.2 Environmental Consequences – Proposed Action

The proposed improvements would require the use of additional heavy machinery for up to 16 months, although not all machinery would be operated at once. Noise disturbance would be limited to general construction activities including clearing, grading, limited excavation, demolition, building repairs, and vehicle traffic to and from the site. All work would occur during daylight hours. No pile driving, drilling, or blasting is anticipated for any of the upgrades.

Standard hatchery operations require the use of generators, heavy machinery, pumps, and other loud equipment and would be ongoing throughout the Proposed Action. The additional construction activities may result in temporary disturbance to staff living in the on-site residences, but impacts are anticipated to be negligible. The next closest residence outside the hatchery boundaries is over three miles away. No noise sensitive receptors are found within the operational facility and therefore would not be affected.

Construction noise may result in avoidance of the sites by wildlife. Since topography and vegetation absorb sound, construction noise impacts are likely to be reduced where there is dense vegetation surrounding the site or by the surrounding topographical changes. BPA is preparing a Biological Assessment to analyze potential impacts to terrestrial and aquatic ESA-listed species from construction-related disturbances, including temporarily increased noise. Based on that analysis, the selected construction contractor would implement specific BMPs to avoid or minimize noise disturbance to ESA-listed species of wildlife in the project vicinity during construction. The Proposed Action would result in **short-term, adverse, low noise impacts** associated with construction, especially with construction BMPs implemented to further reduce impacts.

3.13.3 Environmental Consequences – No Action Alternative

The ambient noise levels in and around the hatchery would not change under the No Action Alternative and there would be **no new noise impacts**.

3.14 PUBLIC HEALTH AND SAFETY

3.14.1 Affected Environment

Public health and safety resources for the Klickitat Hatchery and surrounding area are provided by state, county, and tribal agencies. For emergency services outside of the Yakama Nation Reservation, the Klickitat County Sheriff's office may be contacted and for services within the Reservation, the Yakama Nation Tribal Police Department may be contacted. Emergency 911 calls and dispatch for fire districts, police, and emergency medical services are coordinated by local law enforcement and the proper tribal or county agency is dispatched. The Life Flight Network provides emergency air medical transport in Klickitat County, parts of Yakima County, and the east side of Mount Adams. Fire protection services in the Klickitat Hatchery and the surrounding area is provided by the Klickitat County Fire Protection District No. 8 area, a volunteer fire department staffed by 13 volunteer firefighters in Glenwood, Washington. Fire protection for forest and rangelands within Klickitat County

is provided by Washington Department of Natural Resources (WDNR) and the Yakama Nation Forestry Department (Sharp 2022a).

Due to the topography and remoteness of the hatchery, communication on-site is limited to land-based telephone lines and satellite internet. For emergency health and medical services, the nearest emergency room is located in Goldendale at the Klickitat Valley Hospital, approximately 35 miles from the project area. There are several other emergency service locations including the Skyline Hospital in White Salmon, Washington, the Yakima Valley Memorial Hospital in Yakima, Washington, and Astria Toppenish Hospital in Toppenish, Washington.

Existing health and safety concerns for the hatchery include on-site storage of hazardous materials such as propane, gasoline, and diesel, as well as some areas in close proximity to the river that have steep hillsides that pose a fall and loss of life risk. Natural hazards such as bears, cougars, snakes, insect bites, or poison oak, and health concerns with effluent from the pollution abatement pond also pose a threat. Additional safety hazards include large ungulates that pose a potential danger to vehicle operators by increasing collision risk and hazardous driving conditions in inclement weather, such as slippery or icy roads.

Public use of the hatchery is limited to the hatchery itself and recreational use of the Klickitat River for tribal and non-tribal sport fishing and rafting. There are no public hiking trails that provide access to the hatchery, the river, or surrounding areas.

3.14.2 Environmental Consequences – Proposed Action

Potential impacts to public health and safety resulting from the construction of the proposed improvements include short-term effects associated with construction activities such as a temporary increase in hazardous materials used during construction, including concrete, diesel, and fuel as well as an increased risk of fire exposure due to the use of construction equipment in dry conditions. There is also an increased safety risk for construction workers and hatchery employees. The use of BMPs found in Section 2.4, and adherence to state and federal safety standards, would reduce the potential for these hazards and potential injuries to construction workers and hatchery employees in the vicinity. To ensure that communication service is maintained during construction, the construction contractor would provide a separate telephone line and internet access. Access to the construction areas would be limited to reduce potential hazards to the public and hatchery facility employees. Since there would be limited public access to the hatchery during construction activity, there would **be no public health and safety impacts** to the general public, but there may be **short-term, adverse, low public health and safety impacts** to construction workers and hatchery employees while on the job site and while traveling to and from the project area. There is a minor potential increased risk of traffic collisions, hazardous road conditions, and wildlife strikes; however, BMPs described in Section 2.4 would be implemented to reduce these impacts.

3.14.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction would occur, and there would be **no new impacts** to public health and safety; however, existing health and safety concerns would remain.

3.15 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

3.15.1 Affected Environment

The Proposed Action area lies within the Yakama Nation Reservation and covers parts of both Yakima and Klickitat counties. The hatchery is in a remote, minimally populated area, and is surrounded by undeveloped land. The nearest town is Glenwood, Washington, approximately 5 miles to the southwest, with a population of 303 people and 114 households. Goldendale, Washington, a city 32 miles to the southeast, has a population of 3,612 and 1,622 households (Census 2020). Table 3-7 displays population and employment information for the Yakama Nation Reservation compared to Yakima and Klickitat counties and the State of Washington.

Table 3-7. Population and Employment

Demographic	Geographic Area			
	Yakama Nation Reservation	Yakima County	Klickitat County	Washington State
Total Population	30,647	250,649	22,055	7,512,465
Native American Population	5,978	8,823	415	91,766
Non-Hispanic White Alone Population	5,036	106,349	18,080	5,067,909
Hispanic or Latino Population	18,475	125,004	2,644	971,522
African American Population	40	2,575	255	290,245
Asian American Population	542	2,338	134	662,902
Total Minority Population[1]	25,611	144,300	3,975	2,444,556
Median Household Income	51,106	54,917	56,667	77,006
Employment Rate	60%	62%	54%	65%
Population Below the Poverty Level	20%	17%	16%	10%

[1]Balance of population that is not Non-Hispanic White Alone

Source: Census 2020

In Klickitat County, the main industries are educational services and health care followed by professional, scientific, and management services and lastly agriculture, forestry, fishing, hunting, and mining. Yakima County's largest industries are also educational services and health care, followed by agriculture, forestry, fishing, hunting and mining. By comparison, the Yakama Nation Reservation's largest industry is agriculture, forestry, fishing, hunting, and mining, followed by educational services, health care, transportation, and warehousing.

Sport salmon and steelhead fishing is a common part of the recreation industry that occurs within the project area. Subsistence fishing for salmon and steelhead occurs year-round. Tribal harvests include dip net fishing in the Klickitat River and gill net fishing in the Columbia River. Additional information on fish harvest and other recreational activities can be found in Sections 3.6 and 3.8, respectively.

The Yakama Nation Tribal Employment Rights Ordinance requires employers hiring for a project within or near an Indian Reservation to "give preference to Indians in hiring, promotion, training, temporary reductions in work force, employment, contracting and subcontracting, and all other aspects of business and economic activity" (Yakama Nation 2020). The purpose of this ordinance is to create equal employment and training opportunities for the Yakama Nation tribal members and to eradicate discrimination against Native American people.

3.15.1.1 Environmental Justice

Under Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, federal agencies are required to identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." Consistent with definitions used by the U.S. Census Bureau, minority populations were identified for this analysis as those that identify their race and ethnicity as something other than non-Hispanic White Alone (Census 2011). Low-income populations are those whose family income is below the U.S. Census-defined poverty line or threshold.

Based on the income and poverty information presented above, the Yakama Nation Reservation has a higher proportion of low-income and minority populations than the State of Washington. The low-income population in the project area is in the 60-70th percentile compared to the nation (EPA 2022d). The Yakama Nation Reservation's proportion of low-income population is 3.5 percent higher than Yakima and Klickitat counties, on average and contains more than 50% minority populations. The EPA's Environmental Justice Screening and Mapping Tool was also used to determine environmental justice impacts. The tool identifies environmental justice indexes that combine environmental (ozone, PM 2.5, hazardous waste proximity, etc.) and demographic information to show disadvantaged communities compared to the state and the country. No environmental justice indexes were identified within the proposed project area as elevated compared to the State of Washington or country (EPA 2022d).

3.15.2 Environmental Consequences – Proposed Action

Under the Proposed Action, construction workers would be hired to complete the proposed improvements. This would create a short-term beneficial impact to nearby communities. Construction laborers may inhabit hotels and increase spending in Glenwood or Goldendale, therefore creating a temporary beneficial economic impact. Long-term impacts to the local population would also be beneficial with the possible addition of two new residences on site that would provide housing and employment to two additional employees and their families. Additionally, in compliance with the Yakama Nation's Tribal Employment Rights Ordinance, jobs created by

construction of the project could benefit Native American workers. **Short-** and **long-term** socioeconomic impacts would be **low but beneficial** to the local population.

Construction impacts such as noise from trucks entering or leaving the hatchery, minor increases in traffic on area highways, or minor restrictions to access the hatchery could result in **short-term adverse, low** socioeconomic **impacts**, but such impacts would be temporary and localized.

Construction of the Proposed Action would not cause disproportionately high and adverse effects to the Yakama Nation, low-income populations or minority populations. The Proposed Action would increase the number of spring Chinook salmon smolts being released into the Klickitat and Columbia rivers. This increase in salmon smolts could benefit the Yakama Nation, low-income and minority communities living on the Yakama Nation Reservation by increasing the number of returning fish available for subsistence fishing. Although current access to the river from the hatchery may be limited during construction, this impact would be short-term and low (Section 3.8). There would be no disproportionately high and adverse human health or environmental effects on low-income or minority communities under the Proposed Action indicating there would be **no impact** to environmental justice. The Proposed Action may result in long-term beneficial impacts to environmental justice populations through the increased availability of salmon which would help enhance fish populations, protect Yakama Nation treaty rights, improve ecosystem health, and support traditional subsistence diets and economic activities.

3.15.3 Environmental Consequences – No Action Alternative

Under the No Action Alternative, no construction actions would occur, and there would be **no new impacts** to socioeconomics and **no impacts to** environmental justice **populations**.

3.16 CUMULATIVE IMPACTS

Cumulative impacts are the effects on the environment that result from the incremental effects of an action when added to the effects of other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.1(g)(3)).

3.16.1 Past, Present, and Reasonably Foreseeable Future Actions

Past actions that have adversely affected resources in the project area include the construction and operations of the Klickitat Hatchery and associated spring intakes, pipelines, and access roads, as well as past timber harvest activities. These actions have long-term impacts on resources such as vegetation, wildlife habitat, water and wetlands, and fish through loss of vegetation, decreased habitat availability, possible increased stream temperatures as an indirect result of riparian vegetation removal, and minor reduction in water quality due to effluent releases. Due to the remote and undeveloped state of the surrounding area, no other past actions or projects were identified that would have contributed to cumulative impacts.

Present and reasonably foreseeable future projects include:

- Klickitat Canyon Community Forest Management Plan (WDNR 2017). The Klickitat Canyon Community Forest surrounds the Klickitat Hatchery on three sides. This forest is operated by a local advisory committee which manages the forest to promote forest sustainability and health, fire-resiliency, and recreation opportunities for the community. Timber harvest is not a focus of this plan, but there is a small harvest component to promote forest health.
- The Yakama Nation Forest Management Plan (Yakama Nation 2005) outlines the management goals of the Yakama Nation and the Bureau of Indian Affairs while incorporating requirements of the National Indian Forest Resources Management Act of 1990 (25 USC 33 *et seq.*). The goals in this plan focus on the sustainable yield of timber while protecting the cultural, aesthetic, recreational, and traditional values of the forestland. Silvicultural activities such as timber harvest are a large component of this forest management plan; however, protection of natural resources such as minimizing soil erosion and regulating water run-off are included as well.
- The Middle Columbia River Steelhead 5-Year Recovery Plan was created with the goal of protecting and restoring the ESA-listed Middle Columbia River steelhead (NMFS 2009). As part of this plan steelhead habitat is protected through activities such as preventing the removal of riparian vegetation to keep stream temperatures low as well as preventing habitat fragmentation or breaks in migration routes.
- The Klickitat County Shoreline Master Plan provides a management framework for rivers within Klickitat County to provide fishing, rafting and other recreational opportunities, preserve fish and wildlife habitat, ensure water for residential, commercial, industrial, and agricultural use, and bring tourism to Klickitat County.
- The 2020 National Marine Fisheries Service (NMFS) Columbia River System (CRS) Biological Opinion considered the effects of the proposed operation and maintenance of the CRS and conservation actions on 13 species of salmon and steelhead. NMFS concluded that the actions are not likely to jeopardize these species or destroy or modify their designated critical habitat.
- USFWS and WDNR will continue to manage forest stands in the vicinity surrounding the Klickitat Canyon Community Forest and greater project area for the northern spotted owl and its habitat. This includes annual monitoring for northern spotted owl nests and potential barred owl management and removal as part of the Northern Spotted Owl Recovery Plan (USFWS 2011) and the Barred Owl Management Strategy Plan (87 Federal Register 43886).
- Silviculture activities would continue on Yakama Nation-owned lands, WDNR, and private lands including timber harvest, planting, and thinning.
- Recreational use would continue in the Klickitat Canyon Community Forest, surrounding WDNR lands, and along the Klickitat River.

3.16.2 Transportation

Past, present, and reasonably foreseeable future forest management, access road construction and maintenance, and construction and maintenance of the Klickitat Hatchery have the potential to impact transportation in the project vicinity.

The Proposed Action would result in short-term increases in traffic associated with construction activity. This daily increase in traffic would be minor and construction BMPs (Table 2-2) would be followed to reduce the potential for impacts. The Proposed Action, in combination with other ongoing and future projects, would contribute **short-term, adverse**, **and low impacts.**

3.16.3 Geology and Soils

Past, present, and future activities that affect soils in the project vicinity include timber harvest, timber skidding, tree planting, and maintenance of hatchery or logging access roads. Agricultural activities such as grazing on the Yakama Nation Reservation, WDNR lands, and the Klickitat Canyon Community Forest also have the potential to disturb soils in the surrounding area.

The Proposed Action would contribute to cumulative effects on soils through compaction from construction equipment and vegetation removal as well as the potential for increased erosion. These effects would decrease after the conclusion of construction activity and when the disturbed areas return to existing conditions after vegetation re-establishes and soils stabilize. Through the implementation of construction BMPs, including erosion control measures (Table 2-2), the Proposed Action, in combination with other projects would contribute **short-term, adverse, low** cumulative impacts on soils.

3.16.4 Vegetation and Noxious Weeds

Past, present, and reasonably foreseeable future vegetation removal, access road construction and maintenance, and logging activities may change the vegetation composition, decrease overall diversity in the project vicinity, and increase invasive or non-native vegetation.

Although construction BMPs for the Proposed Action would be implemented to minimize the spread of invasive species and revegetate native plants (Table 2-2), it is still possible for invasive species to remain and result in decreased diversity. Reduced soil productivity and soil compaction may decrease the ability for native plants to re-establish and noxious weeds may persist. The revegetation plan in the Proposed Action includes an adaptive management approach to monitor and reseed native plants, which would limit the extent to which disturbed areas recolonize with non-native species. The Proposed Action in combination with other ongoing and future projects could contribute a **low, adverse** cumulative impact on vegetation through the spread and establishment of invasive species and modification of existing vegetation.

3.16.5 Water Quantity, Rights, and Quality

3.16.5.1 Surface and Groundwater Quantity and Rights

Past, present, and reasonably foreseeable future agricultural irrigation, and residential use and future construction have the potential to impact surface and groundwater quantity and rights.

Though the Proposed Action would likely result in an increased diversion rate from the upper Indian Ford A Spring intake, the increase would remain within the authorized instantaneous water quantity usage available to the hatchery for the spring. No changes in flow to the mainstem Klickitat River would occur. Construction activities may impact groundwater quantities through soil compaction

resulting in short-term adverse impacts. Construction BMPs (Table 2-2) would be followed to reduce the potential for impacts. The Proposed Action, in combination with other ongoing and future projects, would contribute **short-term, adverse, low** cumulative impacts on surface and groundwater quantity and rights.

3.16.5.2 Water Quality

Past, present, and future construction and maintenance of the hatchery, construction and maintenance of access roads in the vicinity, and forest management activities have impacted and have the potential to continue impacting the water quality of the Klickitat River and its tributaries.

The Proposed Action may result in minor erosion and sedimentation during construction and temporarily affect water quality of the Indian Ford A Spring and the Klickitat River. The use of BMPs (Table 2-2) such as the implementation of a SWPPP would reduce or prevent such impacts. The Proposed Action, in combination with other projects, would have **short-term, adverse, low** cumulative impacts to water quality.

3.16.6 Wetlands and Floodplains

Past and ongoing logging activities, construction and maintenance of the hatchery, and construction and maintenance of access roads in the vicinity have impacted streams, rivers, floodplains, and wetlands. Future forest management activities are expected to continue in the surrounding area, which would continue to contribute to these impacts.

The Proposed Action would have no impact to wetlands or new impacts to floodplains as there would be no ground disturbance within mapped wetlands or the 100 year floodplain. The use of BMPs (Table 2-2) such as the implementation of a SWPPP and SPCCP would further prevent impacts. The Proposed Action combined with other projects, would have **no-to-low adverse** cumulative impacts on wetlands and floodplains.

3.16.7 Fish

Past and ongoing logging activities, construction and maintenance of hatchery and logging access roads in the vicinity, and road construction across streams have impacted fish and aquatic habitat through increased erosion and resulting decreased water quality as well as loss of riparian habitat and stream shading. Future forest management activities are expected to continue in the surrounding area which would continue to contribute to these ongoing impacts.

The Proposed Action could temporarily affect fish through displacement by in-air construction noise. This effect would be temporary and would cease after the completion of construction activity. There would be no in-water work in the Klickitat River and therefore, no resulting fish mortality. The Proposed Action could temporarily affect water quality of the Klickitat River and fish habitat during construction from erosion and sedimentation, but such impacts would be mitigated by the use of BMPs (Table 2-2) such as the implementation of a SWPPP. The Proposed Action in combination with past, present, and future logging, access road construction and maintenance, and hatchery

construction and maintenance would have **short-term, adverse, low** cumulative impacts on fish, water quality, and fish habitat.

The transition to an integrated hatchery program through the implementation of the Yakama Nation's Spring Chinook Master Plan would have long-term benefits for the spring Chinook population in the Klickitat River Subbasin (Yakama Nation 2018). Long-term effects to fish populations resulting from increased production and release would be **beneficial and moderate**.

3.16.8 Wildlife

Past and present forest management, access road construction and use, and construction of the Klickitat Hatchery have had a cumulative impact on wildlife and their habitat (including northern spotted owl) in the project vicinity. The clearing and conversion of land for forest management, agricultural activity such as grazing, and other uses have resulted in displacement of wildlife, loss of general wildlife habitat, and loss of northern spotted owl habitat. Future activities in northern spotted owl habitat that occur during the nesting period would contribute to cumulative impacts if disturbance causes behavioral disruptions and injury to this species.

Impacts from the Proposed Action would generally be limited to temporary noise disturbance and a minimal amount of habitat clearing from the new pipeline installation and spring access road improvement. Impacts on wildlife species from the Proposed Action would be low because sufficient habitat is available in the area surrounding the Klickitat Hatchery and wildlife avoidance of the construction areas would be short-term. The Proposed Action in combination with other projects would result in **short-term, adverse low** cumulative impacts to wildlife.

3.16.9 Recreation

Past and ongoing forest management, access road maintenance and construction, nearby development, and agricultural activities (such as grazing) impact recreation opportunities for the public.

The Proposed Action would temporarily limit public access to the Klickitat Hatchery for the public's safety. However, there would be no in-water construction activities; therefore, there would be no resulting impact on recreational use of the river in the immediate project vicinity. No changes to nearby rafting put-ins or access points for sport fishing outside the Yakama Nation Reservation boundaries would occur. In combination with other projects, the Proposed Action would have **no** adverse cumulative impacts on recreation; however, the resulting increase in Chinook salmon would have **long-term, beneficial, low impacts** to recreational fishing due to increased adult salmon for harvest.

3.16.10 Historic and Cultural Resources

Past, present, and future actions that may impact historic and cultural resources include ongoing logging activities, access road construction and maintenance, original construction of the Klickitat Hatchery and associated spring intake and pipeline, and nearby agricultural activities.

Under the Proposed Action, the Yakama Nation conducted three cultural resources surveys, one in 2011, one in 2018, and one in 2022 and found one structure eligible for listing on the NRHP, and other potentially important historic and cultural resources within the project vicinity (see Section 3.2). Proposed modifications to the existing hatchery building would not compromise the building's historical architectural integrity and any other culturally important artifacts would be avoided and not affected by construction activity. The use of construction BMPs (Table 2-2) would reduce potential impacts to cultural resources. In combination with other projects, the cumulative effects of the Proposed Action to historic and cultural resources are expected to be **no-to-low adverse impacts**.

3.16.11 Air Quality

Past, present, and future activities that impact air quality include forest fires and prescribed burns, vehicle emissions on nearby highways, diesel emissions from heavy equipment associated with logging activities, wood burning heating sources at the hatchery and nearby residences, and road dust from unmaintained roadways.

The Proposed Action would have temporary effects to air quality through the use of heavy construction equipment that produces diesel emissions and generation of dust. The use of construction BMPs (Table 2-2) would reduce potential emissions and generation of dust. In combination with other projects, the Proposed Action is expected to contribute to **short-term, adverse, low** cumulative impacts on air quality.

3.16.12 Greenhouse Gases and Climate Change

Past, present, and reasonably foreseeable future projects such as construction, maintenance, and operations of the Klickitat Hatchery, forest management activities, access road construction and maintenance, vehicle traffic in the project vicinity, and heating and cooling in nearby towns have the potential to increase greenhouse gases in the atmosphere and affect global climate change.

The Proposed Action would result in a temporary increase in greenhouse gas emissions through the use of diesel-powered heavy machinery for construction activities. Construction workers traveling to and from the construction site would also temporarily increase greenhouse gas emissions. Project designs in the Proposed Action include measures to reduce greenhouse gas emissions such as the use of gravity-fed systems in the pollution abatement pond to reduce pump use and include water conservation practices such as water reuse in various locations. The implementation of the Yakama Nation's Spring Chinook Master Plan facilitated by the Proposed Action would increase the resiliency of the Chinook salmon population in the face of climate change. With the use of construction BMPs (Table 2-2), the low increase in greenhouse gas emissions would be short-term. The Proposed Action in combination with other projects would result in **short-term, adverse, low** greenhouse gas and global climate change cumulative impacts but **long-term, beneficial, low** cumulative impacts to the Chinook salmon population in a changing climate.

3.16.13 Visual Quality

Past, present, and future forest management has the potential to impact the woodland aesthetic of the area surrounding the hatchery. The original construction of the Klickitat Hatchery in the 1950s

altered the existing aesthetic from woodland and rural to developed hatchery. The hatchery is small and isolated within the forest, so the impact was low.

The Proposed Action would have temporary impacts to the visual aesthetic during construction activity but would not affect the long-term aesthetic. The Proposed Action in combination with forestry management projects would have **no-to-low adverse** cumulative impacts on visual quality.

3.16.14 Noise

Past, present, and future improvements to the Klickitat Hatchery, timber harvest, and road construction and maintenance in the project vicinity may result in noise disturbances in the project vicinity.

The Proposed Action would result in temporary noise associated with heavy equipment for construction activities such as clearing, grading, limited excavation, demolition, building repairs, and vehicle traffic. There would be no pile driving, drilling, blasting, or in-water noise anticipated. Construction noise has the potential to displace wildlife including the northern spotted owl, but construction BMPs (Table 2-2) would be followed to reduce potential impacts of noise to wildlife and fish through the use of sound-control devices. In combination with other projects, the Proposed Action would have **no-to-low, short-term and long-term adverse** cumulative noise impacts.

3.16.15 Public Health and Safety

Past, present, and reasonably foreseeable future improvements to the Klickitat Hatchery, logging activities, access road construction and maintenance, and resource surveys in the project vicinity have the potential to impact public health and safety through increased risk of exposure to hazardous materials (such as concrete and diesel), steep hillsides that pose a fall risk, and natural hazards in the area (such as bears, cougars, snakes, insect bites, and poison oak).

The Proposed Action would result in temporary low public health and safety impacts associated with construction activities. Although public access to the project area would be limited during construction, construction workers may be impacted while traveling to and from the work site through increased risk of traffic collisions, hazardous road conditions, and wildlife strikes. Construction workers also have the potential to encounter hazardous materials such as concrete, diesel fuels, and dust abatement solution as well as an increased risk of fire exposure due to the use of construction equipment in dry conditions. Construction BMPs (Table 2-2) would be required to reduce such risks. There would be no increased risk to the general public as a result of construction due to the restricted access to the construction site. Increased risks associated with the Proposed Action are expected to be short-term. In combination with other projects, there would be **short-term, no-to-low adverse,** cumulative impacts to public health and safety.

3.16.16 Socioeconomics and Environmental Justice

Past, present, and future logging activities in the project vicinity can result in minor changes in local traffic and increased spending in the area due to an increase in employment opportunities. There are

no communities in the project vicinity other than the three existing residences in the Klickitat Hatchery.

The Proposed Action would result in a temporary increase in construction workers and create a beneficial impact to the local community by increasing local spending. The addition of two new residences at the hatchery would result in long-term beneficial socioeconomic impacts through the additional housing and employment opportunities. Adverse effects of the construction, such as increased traffic in the area or minor restrictions in access to the hatchery, are short-term and would not adversely affect the low-income and minority communities found within the Yakama Nation Reservation. Although low-income and minority communities can be found within the project vicinity, these communities would not be disproportionately adversely affected indicating there would be no impact to environmental justice communities. The Proposed Action would result in short-term adverse and beneficial impacts to socioeconomics and no impacts to environmental justice. The cumulative adverse impact in combination with other projects would be **no-to-low**.

4.0 ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT CONSIDERATIONS

Table 4-1 describes how BPA has addressed or plans to address how the Proposed Action considers various federal, state, and local statutes, regulations, and management plans applicable to the project area.

Table 4-1. Applicable Statutory, Regulatory, and Other Considerations

Name	Description
National Environmental Policy Act, 14 U.S.C. § 4321 *et seq.* Council on Environmental Quality National Environmental Policy Act Regulations, 40 CFR Parts 1500-1508, Department of Energy National Environmental Policy Act Implementing Procedures, 10 CFR 1021	This EA was prepared pursuant to NEPA, which requires that BPA assess, consider, and disclose the impacts of its actions on the environment to the public before a decision is made and any work is implemented.
Washington State Environmental Policy Act, 43.21C Revised Code	As the project landowner and a cooperating agency, WDFW will perform environmental review under SEPA, which requires sufficient analysis of probable significant adverse impacts. WDFW will review this EA and make a threshold determination to meet its statutory requirements under SEPA.
Endangered Species Act, 16 U.S.C. § 1531 *et seq.*	BPA is consulting with USFWS and NMFS (Services) regarding potential impacts on ESA-listed species and designated critical habitat that may be found in the project vicinity. Based on preliminary discussions with the Services, BPA has prepared a Draft Biological Assessment considering potential impacts on the northern spotted owl, Oregon spotted frog, gray wolf, bull trout, and steelhead from the Proposed Action. BPA would implement recommended actions to avoid adverse effects on protected species.

Name	Description
Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. § 1801 *et seq.* NMFS Recovery Plan, CR DPS Steelhead (2007) Salmon Enhancement Program, 77.95 RCW	Essential Fish Habitat (EFH) for coho and Chinook salmon, as defined by the Magnuson-Stevens Fishery Conservation and Management Act, is found in the Klickitat subbasin. BPA is consulting with NMFS regarding potential impacts to EFH and ESA-listed MCR steelhead. The Proposed Action is consistent with elements of the state's Klickitat Salmon Recovery and Enhancement Programs.
Bald Eagle and Golden Eagle Protection Act of 1940, 16 U.S.C. § 668-668d	No bald eagle or golden eagle nests have been documented or observed within the construction limits or immediate project vicinity (Yakama Nation 2018). Though there is not old growth habitat within the construction limits, BPA and the contractor would avoid removing large diameter trees to the extent feasible to maintain possible roosting and nesting habitat. Large trees would be surveyed for active nests prior to removal, if necessary.
Migratory Bird Treaty Act, 16 U.S.C. § 703-712 Responsibilities to Federal Agencies to Protect Migratory Birds, Executive Order 13186	Birds protected by the Migratory Bird Treaty Act may be present in the project vicinity; however, no impacts to known routes or protected wildlife areas for migratory birds would occur as a result of the Proposed Action. Potential impacts on nesting northern spotted owls are discussed in Section 3.16. BPA would implement mitigation measures to avoid impacts to nesting and foraging habitat for protected birds.
Fish and Wildlife Conservation Act, 16 U.S.C. § 2901 *et seq.* Fish and Wildlife Coordination Act, 16 U.S.C. § 661 *et seq.*	BPA is preparing a Biological Assessment to support its consultation with the USFWS and would incorporate actions to avoid and minimize potential impacts on fish and wildlife resources (Table 2-2).
Pacific Northwest Electric Power Planning and Conservation Act, 6 U.S.C. § 839 *et seq.*	This EA addresses the environmental review portion of Step 2 of the Council's three-step process for artificial production programs.

Name	Description
Clean Water Act, 33 U.S.C. § 1251 *et seq.* Floodplain/Wetlands Environmental Review Requirements, 10 CFR 1022.12 Floodplain Management, Executive Order 11988 Protection of Wetlands, Executive Order 11990 National Pollutant Discharge Elimination System, 40 CFR 122	BPA delineated two depressional wetlands and the ordinary high water marks for the Klickitat River and Indian Ford A Spring in May and September 2019. In December 2019, the USACE issued a jurisdictional determination that Wetlands A and B, Rearing Pond 24 Outfall, Indian Ford A Spring, and the Klickitat River were waters of the U.S. BPA prepared and submitted a Joint Aquatic Resource Permit Application to achieve project compliance with Sections 401 and 404 of the CWA, floodplain development considerations, and shoreline development permitting. The project would have no effect on identified wetlands, and USACE stated that no permit was required (Evan Carnes, USACE, letter to Mary Todd Haight, BPA, August 5, 2022) because project activities do not involve a discharge of dredged or fill material to any waters of the US. BPA would require the contractor to obtain any necessary stormwater management permits for construction activities and implement a stormwater management plan for the duration of the project. The hatchery will continue to comply with EPA's NPDES general permit for hatchery operations.
Washington Shoreline Management Act, 90.58 RCW	The shoreline of the Klickitat River within Yakama Nation Reservation boundaries is not subject to state jurisdiction.
Clean Air Act, 42 U.S.C. § 7401 *et seq.*	The project would not result in long-term or significant impacts on air quality, as discussed in Section 3.1 and would not inhibit attainment of air quality standards.

Name	Description
Final Mandatory Reporting of Greenhouse Gases Rule, 40 CFR 98 Federal Leadership in Environmental, Energy, and Economic Performance, Executive Order 13514, Council on Environmental Quality National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change (CEQ 2023)	The project would not result in long-term or significant impacts on greenhouse gases, as discussed in Section 3.5 and would not meet the mandatory reporting requirements identified in 40 CFR 98. Salmon and other organisms that have the potential to be impacted by climate change would benefit from the transition to an integrated hatchery that is supported by the proposed facility upgrades. Improved hatchery operations are likely to increase resiliency of the native Chinook salmon population in a changing climate in the long term.
Antiquities Act, 16 U.S.C. § 431-433 Historic Sites Act, 16 U.S.C. § 461-467 National Historic Preservation Act, 54 U.S.C. § 306108 *et seq.* Archaeological Resources Protection Act, 16 U.S.C. § 469a-c Native American Graves Protection and Repatriation Act, 25 U.S.C. § 3001 *et seq.* Indian Sacred Sites, Executive Order 13007 Consultation and Coordination with Indian Tribes, Executive Order 13175	BPA coordinated with the Yakama Nation archaeologists to survey the project area on three occasions during the design process. The Yakama Nation is also a cooperating agency in evaluating potential impacts of the Proposed Action on environmental resources. Though the original hatchery building is eligible for listing on the NRHP, modifications would be limited to its interior to maintain the historic architectural integrity of the building's exterior. BPA would require the selected contractor to implement an inadvertent discovery plan in the event that any potential cultural resources are unearthed during construction. Other BMPs to ensure historic and cultural resource protection are listed in Table 2-2.
Spill Prevention Control and Countermeasures Rule, 40 CFR 112 Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9601 *et seq.* Resource Conservation and Recovery Act, 42 U.S.C. § 6901 *et seq.* Oil and Hazardous Substance Spill Prevention and Response, 90.56 RCW	BPA would implement a Spill Prevention, Containment, and Control Plan to avoid and control chemical spills during construction. Small amounts of fuels, oils, or solvents could be released during construction of the proposed upgrades. All waste produced by project activities would be disposed of in accordance with applicable state and federal regulations.

Name	Description
Noise Control Act, 42 U.S.C. § 4901 *et seq.*	Potential impacts from noise on protected species and the project vicinity are discussed in Section 3.6. Measures to reduce noise-related impacts are discussed in Section 3.6.2, and the noise impacts from the Proposed Action would meet applicable noise requirements.
Environmental Justice, Executive Order 12898	Potential impacts to low-income or minority populations are discussed in Section 3.9. Although low-income and minority communities live within the Yakama Nation Reservation, there would not be any disproportionately high and adverse environmental or human health impacts to these communities. Members of the Yakama Nation Reservation would be involved in the public participation and scoping aspect of the proposed project, and the Yakama Nation is a cooperating agency on the preparation of this EA.
Yakama Nation Forest Management Plan, 2005	BMPs listed in Table 2-2 would avoid or minimize potential impacts on water quality and soil erosion in accordance with the objectives of the forest management plan.
Klickitat River Subbasin Plan, 2004	The goals of the subbasin plan are to: protect or enhance the structural attributes, ecological function, and resiliency of habitats needed to support healthy populations of fish and wildlife, and restore and maintain sustainable, naturally producing populations of spring Chinook and steelhead for tribal and non-tribal harvest and cultural and economic practices while protecting the biological integrity and the genetic diversity of the subbasin (Yakama Nation et al. 2004). Impacts to fish, wildlife, and cultural resources that align the project objectives with those of the subbasin plan are discussed in Sections 3.3, 3.16, and 3.2, respectively.

Name	Description
Washington Watershed Planning, 90.82 RCW	Yakama Nation Reservation and tribal trust lands are not within the geographic area that is subject to the Klickitat Subbasin Watershed Management Plan or the Detailed Implementation Plan (WRIA 30 WRPAC 2005).
Yakama Nation Tribal Permits	The contractor would obtain necessary building, electrical, or land use development permits required by Yakama Nation for the construction of the new facilities on Reservation lands.
Council on Environmental Quality Guidance for Federal Departments and Agencies on Indigenous Knowledge, Executive Order 14072 Strengthening the Nation's Forests, Communities, and Local Economies, Executive Order 14049 White House Initiative on Advancing Educational Equity, Excellence, and Economic Opportunity for Native Americans and Strengthening Tribal Colleges and Universities, Executive Order 13990 Protecting Public Health and The Environment and Restoring Science to Tackle the Climate Crisis	Throughout the development of this project and EA, BPA has worked closely with the Yakama Nation and applied indigenous knowledge in alternatives development. In a 2021 Memorandum of Agreement, BPA and Yakama Nation established roles and responsibilities for the design and construction of the proposed upgrades, with a commitment to transparency and cooperation. To the fullest extent practicable, sovereign interests would be supported and consistency with treaty rights and government-to-government principles would be maintained. BPA will continue to work closely with Yakama Nation throughout the project.
Water Right Coordination and Compliance	Yakama Nation would coordinate with Ecology to document that the Proposed Action complies with the existing water right associated with the hatchery's water use from Indian Ford A Springs.

5.0 PERSONS, TRIBES, AND AGENCIES CONSULTED

Interested stakeholders including contacts for tribes, local, state, regional, and federal agencies as well as interest groups and interested landowners have been contacted for scoping comments and a review of this draft EA. Entities contacted are listed below.

Federal Agencies

- U.S. Department of Interior Bureau of Indian Affairs
- U.S. Fish and Wildlife Service
- U.S. House of Representatives District 4 Honorable Dan Newhouse
- U.S. Army Corps of Engineers
- National Marine Fisheries Service

Tribes and Tribal Groups

- Columbia River Inter-Tribal Fish Commission
- Yakama Nation

State Agencies

- Washington Department of Fish and Wildlife
- Washington Department of Ecology
- Washington Department of Natural Resources
- Washington Department of Transportation

Local Government, Utilities and River User Groups

- Klickitat County District 3 Board of Commissioners
- Yakima County Department of Planning
- Northwest RiverPartners
- PNGC Power

Local Organizations

- Federation of Fly Fishers
- White Salmon Steelheaders Association
- Wild Fish Conservancy

6.0 GLOSSARY

Term	Definition
Acclimation pond	A pond that allows artificially-produced fish that are raised elsewhere to be acclimated to a waterbody prior to release with the intention that, as adults, those fish will return to the waters in which they were released.
Broodstock	Mature adult fish collected from a river system and used for the creation of juveniles in artificial production programs. Eggs and milt (sperm) are harvested from broodstock to create fertilized eggs that are incubated in the hatchery environment.
Cofferdam	A watertight enclosure from which water is pumped to expose the bottom of a body of water to allow construction.
Escapement	The portion of an anadromous fish population that escapes capture and reaches their spawning grounds.
Fish ladder	A series of pools built like steps to enable fish to bypass passage barriers, such as a dam or waterfall.
Fishway	Another term for fish ladder.
Floodplain	Channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height.

Term	Definition
Integrated harvest program	A program where fish are propagated as genetically similar or integrated populations relative to naturally spawning populations.
Liquefaction	A phenomenon in which the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading.
Natural-origin fish	Fish that are not produced in artificial production facilities, but from parents that spawned in the wild.
Raceway	An artificially-created pool used to hold and rear fish in artificial production facilities.
Salmonids	Belonging or pertaining to the family Salmonidae, including salmon, trouts, chars, and whitefishes.
Segregated harvest program	A program where fish are propagated as genetically separate or segregated populations relative to naturally spawning populations.
Seral	A sere or seral stage is a stage within ecological succession composed of various vegetation communities that occupy disturbed sites.
Smolt	A young salmon that is at the stage of development when it is ready to migrate to the sea.
Upriver brights	The run of fall Chinook salmon that retain their bright sides and firm flesh as they swim through the lower Columbia River. Upriver brights are favored by commercial and sport fishers in fresh water for their large size and firm flesh.

Term	Definition
Volitionally released	To be released (as in from hatcheries) without being forced.
Weir	A fence, pickets, or other enclosure installed in a waterway to prevent upstream migration and to allow for fish collection.

7.0 REFERENCES

Allen, Brady. 2022. Fisheries Biologist, Bonneville Power Administration. Personal communication regarding fish species that spawn in the Klickitat River. October 27, 2022.

Aspect Consulting. 2007. Framework for Water Management in WRIA 30 Klickitat River Watershed, Version 1.0. Prepared for WRIA 30 Water Resource Planning and Advisory Committee. Project No. 070024-001-02. June 29, 2007. (https://www.klickitatcounty.org/DocumentCenter/View/148/Framework-for-Water-Management-in-WRIA-30---June-2007-PDF). Accessed August 2022.

Bonneville Power Administration (BPA), the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes and Bands of the Yakama Nation, and the Columbia River Inter-Tribal Fish Commission. 2008. Columbia Basin Fish Accords Memorandum of Agreement between the Three Treaty Tribes and FCRPS Action Agencies. 32 pages + attachments.

BPA. 2011. Klickitat Hatchery Complex Program Biological Assessment. Unpublished report. Bonneville Power Administration and Confederated Tribes and Bands of the Yakama Nation.

BPA. 2019. Klickitat Hatchery Wetland Delineation Report. Revised September 2019. Project No. 1988-115-35.

BPA. 2021. Klickitat Subbasin Monitoring and Evaluation – Yakima/Klickitat Fisheries Project (YKFP). Adult Salmon and Steelhead Monitoring Report 2016-2020. Prepared by Joseph Zendt, Shawn Bechtol, and Michael Babcock. Yakama Confederated Tribes, Klickitat, WA, 98628. 4/2021.

BPA. 2022. Klickitat Hatchery Special-Status Plant Species Survey Report. Revised May 2022.

Columbia River Inter-Tribal Fish Commission (CRITFC). 2022. Klickitat Hatchery Spring Chinook Upgrades Scoping Letter Response.

Council on Environmental Quality (CEQ). 1986. 46 Federal Regulation 18026: Memorandum to Agencies: Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations. March 23, 1981, as amended 1986. https://www.energy.gov/sites/default/files/2018/06/f53/G-CEQ-40Questions.pdf.

CEQ. 2023. National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change. January 9, 2023. https://www.federalregister.gov/documents/2023/01/09/2023-00158/national-environmental-policy-act-guidance-on-consideration-of-greenhouse-gas-emissions-and-climate. Accessed February 2023.

Finch, D. M., Butler, J. L., Runyon, J. B., Fettig, C. J., Kilkenny, F. F., Jose, S., Frankel, S. J., Cushman, S. A., Cobb, R. C., Dukes, J. S., Hicke, J. A., Amelon, S. K. 2021. Effects of Climate Change on Invasive Species. In: Poland, T.M., Patel-Weynand, T., Finch, D.M., Miniat, C.F., Hayes, D.C.,

Lopez, V.M. (eds) Invasive Species in Forests and Rangelands of the United States. Springer, Cham. Pages 57-83. https://doi.org/10.1007/978-3-030-45367-1_4

Hatchery Scientific Review Group (HSRG). February 2009. Columbia River Hatchery Reform System-Wide Report. 272 pages.

Hess, J., Matala, A., Zendt, J., Frederiksen, C., Sharp, W., and Narum, S. 2011. Introgressive hybridization among major Columbia River Chinook salmon (Oncorhynchus tshawytscha) lineages within the Klickitat River due to hatchery practices. Canadian Journal of Fisheries and Aquatic Sciences. 68. 1876-1891. 10.1139/F2011-107.

Korosec, M.A. 1987. Geologic Map of the Mount Adams Quadrangle. Washington Division of Geology and Earth Sciences. (https://www.dnr.wa.gov/programs-and-services/geology/geologic-maps/surface-geology#get-our-maps)

National Marine Fisheries Service (NMFS). 2009. Middle Columbia River Steelhead Distinct Population Segment ESA Recovery Plan. (https://www.fisheries.noaa.gov/resource/document/recovery-plan-middle-columbia-river-steelhead-distinct-population-segment). Accessed October 14, 2021.

National Oceanic and Atmospheric Administration (NOAA). 2022. Climate Change: Global Temperature Projections. (https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature-projections#:~:text=Results%20from%20a%20wide%20range,gases%20that%20human%20activities%20produce). Accessed September 20, 2022.

National Resource Conservation Service (NRCS). 2021. Web Soil Survey: Yakama Nation Closed Area Soil Map. Washington. United States Department of Agriculture. (http://websoilsurvey.sc.egov.usda.gov/). Accessed September 2022.

North American Invasive Species Management Association (NAISMA). 2021. Climate Change and Invasive Species. (https://www.nisaw.org/climatechange/#:~:text=Research%20has%20shown%20that%20under,trees%20and%20more%20abundant%20pests). Accessed October 12, 2022.

Nuetzmann, M. 2009. Klickitat Hatchery Project – Wildlife Report. Yakama Nation Wildlife Resource Management Program. Unpublished report to B. Sharp, Yakama Nation.

Nuetzmann, M. 2018. Klickitat Hatchery Project – Wildlife Report. Yakama Nation Wildlife Resource Management Program. Unpublished report to B. Sharp, Yakama Nation.

Nuetzmann, M. 2022. Forest Biologist, Yakama Nation. Personal communication via email, regarding wildlife observations within the project vicinity. Toppenish, WA. September 12, 2022.

Pacific Fishery Management Council (PFMC). 2022. Pacific Coast Salmon Fishery Management Plan for Commercial and Recreational Salmon Fisheries Off the Coasts of Washington, Oregon, and California as Revised Through Amendment 22. August 2022. Portland, Oregon.

Sharp, Bill. 2022a. Research Scientist, Yakama Nation Fisheries. Personal communication via email, regarding emergency fire response to the Klickitat Hatchery. Toppenish, WA. September 2, 2022.

Sharp, Bill. 2022b. Research Scientist, Yakama Nation Fisheries. Personal communication via email, regarding recreational access in and around the Klickitat Hatchery. Toppenish, WA. October 28, 2022.

U.S. Census Bureau (Census). 2011. Overview of Race and Hispanic Origin: 2010. 2010 Census Briefs. C2010BR-02. (https://www.census.gov/prod/cen2010/briefs/c2010br-02.pdf). Accessed August 8, 2022.

Census. 2020. American Community Survey Data. (https://data.census.gov). Accessed August 8, 2022.

U.S. Environmental Protection Agency (EPA). 2022a. Washington Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. (https://www3.epa.gov/airquality/greenbook/anayo_wa.html). Accessed September 16, 2022.

EPA. 2022b. Basics of Climate Change. (https://www.epa.gov/climatechange-science/basics-climate-change#greenhouse). Accessed September 20, 2022.

EPA. 2022c. Learn about Greenhouse Gas Reporting Program (GHGRP). (https://www.epa.gov/ghgreporting/learn-about-greenhouse-gas-reporting-program-ghgrp). Accessed September 21, 2022.

EPA. 2022d. EJScreen ACS Summary Report. (https://ejscreen.epa.gov/mapper/). Accessed October 2022.

U.S. Fish and Wildlife Service (USFWS). 2011. Revised Recovery Plan for the Northern Spotted Owl (*Strix occidentalis caurina*). U.S. Fish and Wildlife Service, Portland, Oregon.

USFWS. 2021. USFWS Complete Species Current Range GIS Data.

U.S. Geological Survey (USGS). 2020. Outlet Falls Quadrangle, Washington. U.S. Department of the Interior. (https://ngmdb.usgs.gov/topoview/viewer/#12/46.0289/-121.2201). Accessed September 2022.

USGS. 2022. National Water Information System: Web Interface. USGS Surface-Water Monthly Statistics for the Nation. Available at: https://waterdata.usgs.gov/nwis/monthly/?referred_module=sw. Accessed August 2022.

Washington Department of Fish and Wildlife (WDFW). 2018. Statewide Washington Integrated Fish Distribution – SWIFD. 1st Edition. Publication Date: 20180404. (https://geo.wa.gov/datasets/wdfw::statewide-washington-integrated-fish-distribution/). Accessed August 2022.

WDFW. 2021. Northern Spotted Owl Nest Site GIS Data. Provided by BPA.

WDFW. 2022a. Canada Lynx. (https://wdfw.wa.gov/species-habitats/species/lynx-canadensis#desc-range). Accessed September 13, 2022.

WDFW. 2022b. Yellow-billed cuckoo. (https://wdfw.wa.gov/species-habitats/species/coccyzus-americanus#desc-range). Accessed September 13, 2022.

WDFW. 2022c. Washington Gray Wolf Conservation and Management 2021 Annual Report. (https://wdfw.wa.gov/publications/02317). Accessed September 14, 2022.

WDFW 2022d. Wolverine. (https://wdfw.wa.gov/species-habitats/species/gulo-gulo-luscus#desc-range). Accessed September 13, 2022.

WDFW. 2022e. Threatened and Endangered Species. (https://wdfw.wa.gov/species-habitats/at-risk/listed?species=&state_status=All&federal_status=All&category=All&page=1). Accessed July 27, 2022.

WDFW. 2022f. Priority Habitat and Species. (https://wdfw.wa.gov/species-habitats/at-risk/phs). Accessed October 7, 2022.

Washington Department of Natural Resources (WDNR). 2017. Klickitat Canyon Community Forest Management Plan.

WDNR. 2022. Washington Geologic Information Portal. (https://geologyportal.dnr.wa.gov/). Accessed September 2022.

Washington Department of Transportation (WSDOT). 2022. Traffic Count Database System. (https://wsdot.public.ms2soft.com/tcds/tsearch.asp?loc=Wsdot&mod=TCDS). Accessed August 11, 2022.

Washington Natural Heritage Program (WNHP). 2021. Rare Plant Database. (https://www.arcgis.com/home/item.html?id=34fb23d474d14a55bfbf670d065209c3). Database accessed July 25, 2022.

Washington State Department of Ecology (Ecology). 2021. Washington State Greenhouse Gas Emissions Inventory: 1990-2018. (https://ecology.wa.gov/Air-Climate/Climate-change/Tracking-greenhouse-gases/GHG-inventories). Accessed September 20, 2022.

Ecology. 2022a. Water Rights Tracking System, Water Rights Map Search Results. (https://appswr.ecology.wa.gov/waterrighttrackingsystem/WaterRights/Map/WaterResourcesExplorer.aspx?from=menu). Accessed August 2022.

Ecology. 2022b. Water Quality Atlas. (https://apps.ecology.wa.gov/waterqualityatlas/wqa/map). Accessed August 2022.

Watershed Professionals Network and Aspect Consulting. 2005. Klickitat Basin (WRIA 30) Watershed Management Plan. Prepared for WRIA 30 Watershed Planning Unit. May 3, 2005. (https://www.klickitatcounty.org/DocumentCenter/View/149/Klickitat-River-Basin-WRIA-30-Watershed-Management-Plan---May-2005-PDF). Accessed August 2022.

Whitewater Guidebook. 2022. Klickitat River. (https://www.whitewaterguidebook.com/washington/klickitat-river/). Accessed November 2022.

WRIA 30 Water Resource Planning and Advisory Committee (WRPAC). 2005. Detailed Implementation Plan, Klickitat River Basin (WRIA 30). Klickitat County, Washington.

The Confederated Tribes and Bands of the Yakama Nation (Yakama Nation) and WDFW. 2008. Draft Klickitat River Anadromous Fisheries – Master Plan Appendix B. Prepared by The Confederated Tribes and Bands of the Yakama Nation in cooperation with Washington Department of Fish

and Wildlife. Principal Preparers: W. Sharp, C. Frederiksen, W. Bosch, and D.J. Warren & Associates, Inc. Yakama/Klickitat Fisheries Project 1198811535.

The Confederated Tribes and Bands of the Yakama Nation (Yakama Nation). 2005. Forest Management Plan, Yakama Reservation. Prepared by the Yakama Nation and the Bureau of Indian Affairs. Yakama Nation, Toppenish, WA.

Yakama Nation. 2006. Yakima/Klickitat Fisheries Project. (http://www.ykfp.org/klickitat/klickhatch.htm).

Yakama Nation. 2018. Klickitat River Spring Chinook Master Plan. Prepared in cooperation with Washington Department of Fish and Wildlife. Yakama Nation, Toppenish, WA.

Yakama Nation. February 2019. Klickitat Spring Chinook: Integrated Program Description, Analysis, and Implementation Schedule. Yakama Nation, Toppenish, WA. 30 pages.

Yakama Nation. 2020. Title LXXI (71): Yakama Nation Tribal Employment Rights Ordinance.

Yakama Nation, Klickitat County, and Washington Department of Fish and Wildlife. 2004. Klickitat Subbasin Plan. Prepared for the Northwest Power Planning and Conservation Council. Jeff Spencer and Heather Simmons-Rigdon, coordinators. May 28, 2004.

APPENDIX A: PUBLIC SCOPING COMMENTS

`

Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621

ENVIRONMENT, FISH & WILDLIFE

August 12, 2022

In reply refer to: ECF-4

To: People interested in the Klickitat Hatchery Spring Chinook Upgrades

The Bonneville Power Administration (BPA) is proposing to fund capital improvements to facilities at the existing Klickitat Fish Hatchery in Klickitat County within the Yakama Nation Reservation in Washington. This letter explains what is being proposed, outlines our anticipated environmental review process and schedule, and requests your comments.

Proposal: BPA is proposing to fund capital improvements to existing facilities at the Klickitat Hatchery that would support an increase in spring Chinook salmon production and allow the Yakama Nation to transition from a segregated to an integrated spring Chinook production program. The hatchery was built in 1954 and most of the facilities have not been renovated. It is operated jointly by the Yakama Nation and Washington Department of Fish and Wildlife (WDFW). The upgrades would support Bonneville's commitments to the Yakama Nation under the 2020 Columbia River Fish Accord Extension agreement, while also supporting ongoing efforts to mitigate for effects of the FCRPS on fish and wildlife in the mainstem Columbia River and its tributaries pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. (USC) 839 *et seq*.).

On October 6, 2017, BPA published a Notice of Intent in the Federal Register (Vol. 82, No. 193) to begin preparing an EIS for improvements to the Klickitat Hatchery. Since that time, BPA has further developed designs and conducted extensive coordination with permitting agencies to confirm that existing permits would address the proposed changes. This coordination, in combination with efforts to minimize effects to resources, indicate that an Environmental Assessment and Finding of No Significant Impact may be more appropriate for this project, but BPA will make this determination after the public scoping process concludes.

The proposed upgrades would include improving the spring water intakes, discharge piping, and river pump station; rebuilding the pollution abatement system; adding circular rearing tanks, adding a chemical storage building, updating the existing fish ladder and spawning and adult holding infrastructure, and possibly adding two staff residences, predator control netting over the raceways, and updates to hatchery building administrative space.

The proposed upgrades are designed to improve rearing conditions for spring Chinook, which would provide the capacity to increase production from 600,000 spring Chinook yearling smolts to 800,000 smolts. Upgrades would help the spring Chinook program transition from using only hatchery-raised fish for broodstock (a "segregated" or "isolated" program) to a program that incorporates natural-origin fish in the broodstock (an "integrated" program). Incorporating natural-origin fish into the broodstock is expected to increase the fitness, productivity, survival, and harvest of this species.

All fish production (spring and fall Chinook and coho salmon) operations and facility maintenance at the hatchery has been funded through the National Marine Fisheries Service under the Mitchell Act (16 U.S.C. 755-757) since the hatchery was built in 1954. BPA is not proposing to fund fish production or to assume responsibility for any Mitchell Act funding for the Klickitat Hatchery. BPA funds would be limited to the proposed capital improvements to support spring Chinook production.

Environmental Review: To understand the potential environmental impacts of this proposal, BPA may prepare an environmental assessment (EA). If BPA determines that an EA should be prepared, the EA will describe anticipated impacts to natural and human resources and include mitigation measures that would help avoid or minimize impacts. We are asking for your comments to help determine the issues that should be addressed in the environmental review. During this process, BPA will work with Federal, state, and local agencies, Tribes, potentially affected landowners, and other interest groups. The proposed schedule for the environmental review process is as follows:

Scoping comment period	August 12 – Sept 12, 2022
Draft EA available for public comment (if warranted)	December 2022
Virtual Public Meeting for Draft EA (if warranted)	December 2022
Final EA (if warranted)	February/March 2023
Finding of No Significant Impact (if warranted)	February/March 2023
If decision to build, construction would start	Spring/Summer 2023

How to Comment: Please send your comments by **September 12, 2022** and reference the *Klickitat Hatchery Upgrades*. All comments will be available on the project website at *www.bpa.gov/nepa/klickitat-hatchery-upgrades*. There are several ways to comment:

Mail: Bonneville Power Administration
Public Affairs – DKE-7
P.O. Box 14428
Portland, OR 97291-4428

Toll-free: 800-622-4519
FAX: 503-230-4019
Online: *www.bpa.gov/comment*

For More Information: If you have questions regarding the environmental review process, please contact me at 503-230-5206, or by e-mail at *casharp@bpa.gov*. You can also reach us toll free at 1-800-622-4519.

Thank you for your interest in our work.

Sincerely,

/s/ Carolyn A. Sharp
Carolyn A. Sharp
Environmental Protection Specialist

Enclosures:
Comment Form
Return Envelope

KLICKITAT HATCHERY SPRING CHINOOK UPGRADES

"I'd like to tell you…"

Please have your studies look at:

I need more information about:

I have these other comments:

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

A return, postage-paid envelope was provided to submit your comments.

Other ways to comment:

Mail: Bonneville Power Administration
Public Affairs – DKE-7
P.O. Box 14428
Portland, OR 97291-4428

Toll-free: 800-622-4519
FAX: 503-230-4019
Online: www.bpa.gov/comment

Please mention "*Klickitat Hatchery Upgrades*" in your correspondence.
For project information visit: www.bpa.gov/nepa/klickitat-hatchery-upgrades

The comment period ends September 12, 2022.

COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

700 NE Multnomah Street, Suite 1200
Portland, Oregon 97232

(503) 238-0667
F (503) 235-4228
www.critfc.org

September 8, 2022

Bonneville Power Administration
Public Affairs – DKE-7
P.O. Box 14428
Portland, OR 97291-4428

Dear Bonneville Power Administration:

Subject: Klickitat Hatchery Spring Chinook Upgrades

The Columbia River Inter-Tribal Fish Commission (CRITFC) would like to express its support for the Klickitat Hatchery Spring Chinook Upgrades Project. CRITFC serves the four Columbia Basin treaty tribes – the Yakama, Warm Springs, Umatilla, and Nez Perce– by protecting their treaty fishing rights, including conducting research that informs fish restoration and management. These goals collectively ensure the preservation of fisheries resources that are critical to the tribes' cultures and identities.

The Klickitat Hatchery Spring Chinook Upgrades Project allows for critical infrastructure upgrades that will contribute to both fish restoration and harvest goals. Integrated broodstock management and circular rearing tanks are both practices shown to increase the fitness of hatchery-reared fish[1], thereby increasing survival to maturity, and reducing genetic divergence between hatchery and natural fish. These outcomes, along with the increase in production to 800,000 smolts, will increase harvest opportunities for commercial, recreational, and tribal fishers. Additionally, these upgrades will build greater resiliency to climate change effects, both by equipping the hatchery with systems that can counteract temperature-induced stress (i.e., improved spring water intakes) and by using the integrated broodstock production to seed upper basin cold water habitat.

This project substantiates BPA's commitment to agreements outlined in the Columbia Basin Fish Accords (2008) and the Northwest Power Act (1980) through actions that have been desperately needed for many years but rarely supported. Many current hatchery facilities struggle to meet production and restoration goals because of outdated equipment that cannot adequately adapt to human and climate-induced stressors. This capital improvement project is a significant recognition of the need to build more dynamic hatcheries. Capital improvement projects for facilities across the Columbia Basin will further validate BPA's commitment to honoring tribal partnerships and agreements made to preserve fish species that have defined our member tribes' cultures since time immemorial.

Please contact Hayley Nuetzel at hnuetzel@critfc.org with follow-up questions or comments.

Sincerely,

Aja K. DeCoteau
Executive Director

[1]Davison, W., 1997, Comparative Biochemistry and Physiology Part A: Physiology, **117**(1); Timmons, M.B., et al., 1998, Aquacultural Engineering, **18**(1); Araki, H., et al., 2007, Conservation Biology, **21**(1); Hess, M.A., et al., 2012, Mol Ecol, **21**(21); Ford, M.J., et al., 2016, PLOS ONE, **11**(10); Janowitz-Koch, I., et al., 2019, Evol Appl, **12**(3).

Klickitat Hatchery Spring Chinook Upgrades

The following comments were submitted in response to the open comment period described below.

Comments are numbered consecutively as they are received. Breaks in the number sequence result when comments are deleted because they were submitted in error or have inappropriate content (such as SPAM). If you do not see your comment two business days after you submit it, please contact (800) 622-4519.

BPA is proposing to fund capital improvements to existing facilities at the Klickitat Hatchery that would support an increase in spring Chinook salmon production and allow the Yakama Nation to transition from a segregated to an integrated spring Chinook production program. The hatchery was built in 1954 and most of the facilities have not been renovated. It is operated jointly by the Yakama Nation and Washington Department of Fish and Wildlife. Your comments will help BPA determine the issues that should be addressed in the environmental review.

For More Information:
https://www.bpa.gov/learn-and-participate/public-involvement-decisions/project-reviews/klickitat-hatchery-upgrades-doe-eis-0535

Close of comment: 9/12/2022

KHSC22220001 - pace
Thanks for the opportunity to comment. The Klickitat River spring Chinook hatchery has a long and controversial history of operational problems, as well as concerns with its deleterious impacts on naturally spawning populations. I don't want to revisit the many 'Frankenfish' fights between enviros, Yaks, WDFW and federal parties. They were, in retrospect, a near-total waste of everyone's time. The only reason I even bring it up is because ratepayers' resources will be used to support a transition from a segregated to an "integrated" spring Chinook production program." How many times have we heard the "integrated" yarn? When the going gets tough the tough get "integrated." Well … who could object to that? Sine die. And if people have Frankenfish problems they can go pound sand. The other thing I would like to bring to your attention is about funding. Using ratepayers' resources for this program (obviously) violates the "in lieu" provisions of the Northwest Power Act. This hatchery's operational problems caused by long-term deferral of required maintenance are hardly unique to the hatchery on the Klick. Ivan Donaldson, the Corps' first biologist whose career began in 1938 at Bonneville,was an early and consistent critic of Mitchell Act hatcheries, railing against their failures to function properly because of cost cutting and diversion of funds. Against this backdrop, the assertion that expenditures of BPA funds will be limited to proposed capital improvements doesn't pass the straight face test and, more importantly, in no way obviates the clear violation of restrictions on in-lieu funding. This program is clearly the responsibility of the Yaks, WDFW, et al., not ratepayers. But, funds provided for this project are actually "hush money" laundered thru the Power Council and paid to silence objections from the Yakama and other tribes to the action agencies' destruction and adverse modifications of critical habitat. In that geriatic brothel, violations of in-lieu restrictions are the rule rather than the exception. So, all things considered, full steam ahead with the environmental review process giving the minimal mention possible to the issues I have brought to your attention. As my accountant says, "If you don't care I don't care." Thanks for the opportunity to comment.

KHSC22220002 - Nuetzel/Columbia River Inter-Tribal Fish Commission

Please see the attached.

View Attachment

Vulnerability Disclosure Program

If you believe information on this site is missing or in error, please Submit that comment here.

APPENDIX B: FINAL DESIGN PLANS

PLAN VIEW
SCALE: 1" = 40'

0 40 80 120 FT
SCALE: 1"=40'

N.

DEMOLITION KEY NOTES: (#)

1. DEMOLISH AND REMOVE EXISTING ADULT HOLDING RACEWAYS, SPAWNING EQUIPMENT, FENCING AND ALL ASSOCIATED PIPING, VALVES, AND EQUIPMENT. RETAIN AND PROTECT EXISTING FISHWAY.
2. REMOVE UNDERGROUND UTILITIES INCLUDING 19" DIA DRAIN FROM RACEWAY BANKS B & C, 12" DIA DRAIN FROM RACEWAY BANK A, 19" DIA IFAU SUPPLY PIPE AND EXISTING UNDERGROUND DISCHARGE PIPING ASSOCIATED WITH THE TEMPORARY1990 VINYL POND INSTALLATION.
3. DEMOLISH AND REMOVE EXISTING POLLUTION ABATEMENT POND, AERATION PUMP AND ASSOCIATED PIPING, VALVES AND EQUIPMENT.
4. DEMOLISH AND REMOVE EXISTING PIPING AT INFLUENT AND OUTLET OF POND 24 AND ASSOCIATED SPRINKLERS.
5. DEMOLISH AND REMOVE INTERIOR OF THE HATCHERY BUILDING'S ADMINISTRATION SPACE TO FACILITATE NEW CONSTRUCTION. RETAIN AND PROTECT EQUIPMENT WITHIN INCUBATION AREA FOR CONTINUED USE DURING CONSTRUCTION.

NOTES:

1. ALL DEMOLITION ACTIVITIES MUST BE COORDINATED TO MINIMIZE IMPACT WITH YN HATCHERY ACTIVITIES. SEE SPECIFICATIONS FOR COMPLETE WORK RESTRICTIONS.
2. COORDINATE WITH YN FOR EQUIPMENT AND SENSOR REMOVAL IN THE RACEWAYS, HATCHERY BUILDING OR AROUND THE SITE BEFORE BEGINNING DEMOLITION.
3. RETAIN AND PROTECT EXISTING HATCHERY BUILDING DURING CONSTRUCTION.
4. SEE SHEET 20 D 1 FOR INDIAN FORD A SPRING INTAKE DEMOLITION REQUIREMENTS.
5. ALL REQUIRED TREE REMOVAL SHALL BE MARKED BY CONTRACTOR AND COORDINATED WITH THE OWNER BEFORE REMOVAL.

NO.	DESCRIPTION	DATE

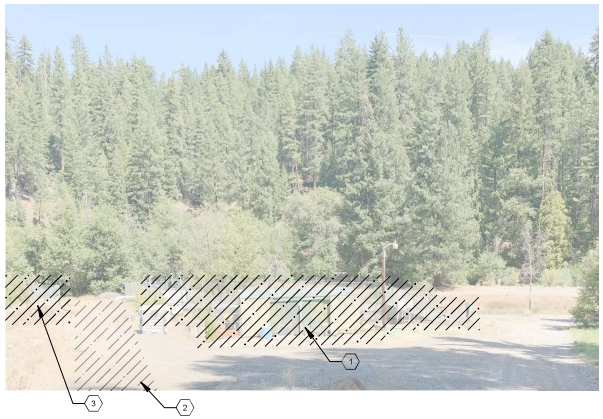
CHECKED BY: JRE
DRAWN BY: BAT
DESIGNED BY: BJC
DATE
STATE PROFESSIONAL ENGINEER NO. XXXXX

Schnabel ENGINEERING
330 S. 5th Street, Suite 510 | Boise, Id 83702
Phone: 208-331-0738
schnabel-eng.com

KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

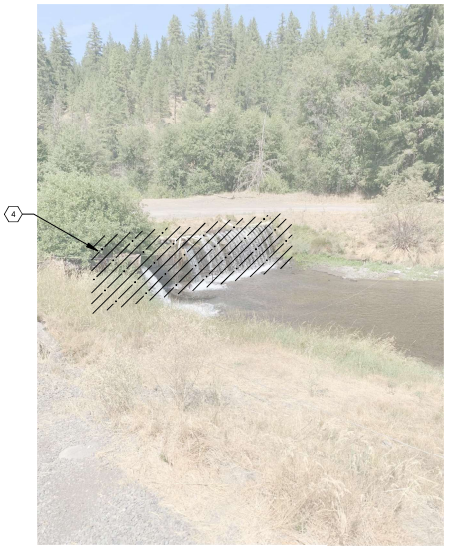
DEMOLITION PLAN

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET
10 D 2



PHOTOGRAPH 1 (10 D 2)
SCALE: *

PHOTOGRAPH 2 (10 D 2)
SCALE: *



PHOTOGRAPH 3 (10 D 2)
SCALE: *

PHOTOGRAPH 4 (10 D 2)
SCALE: *

PHOTOGRAPH 5 (10 D 2)
SCALE: *

DEMOLITION KEY NOTES: (#)

1. DEMOLISH AND REMOVE EXISTING ADULT HOLDING RACEWAYS, SPAWNING EQUIPMENT, FENCING AND ALL ASSOCIATED PIPING, VALVES, AND EQUIPMENT. RETAIN AND PROTECT EXISTING FISHWAY.
2. REMOVE UNDERGROUND UTILITIES INCLUDING 19" DIA DRAIN FROM RACEWAY BANKS B & C, 12" DIA DRAIN FROM RACEWAY BANK A, 19" DIA IFAU SUPPLY PIPE AND EXISTING UNDERGROUND DISCHARGE PIPING ASSOCIATED WITH THE TEMPORARY1990 VINYL POND INSTALLATION.
3. DEMOLISH AND REMOVE EXISTING POLLUTION ABATEMENT POND, AERATION PUMP AND ASSOCIATED PIPING, VALVES AND EQUIPMENT.
4. DEMOLISH AND REMOVE EXISTING PIPING AT INFLUENT AND OUTLET OF POND 24.
5. DEMOLISH AND REMOVE INTERIOR OF THE HATCHERY BUILDING'S ADMINISTRATION SPACE TO FACILITATE NEW CONSTRUCTION. RETAIN AND PROTECT EQUIPMENT WITHIN INCUBATION AREA FOR CONTINUED USE DURING CONSTRUCTION.

REV	DESCRIPTION	DATE

DESIGNED BY: BJC
DRAWN BY: BJT
CHECKED BY: JRE
DATE
STATE PROFESSIONAL ENGINEER NO. XXXXX

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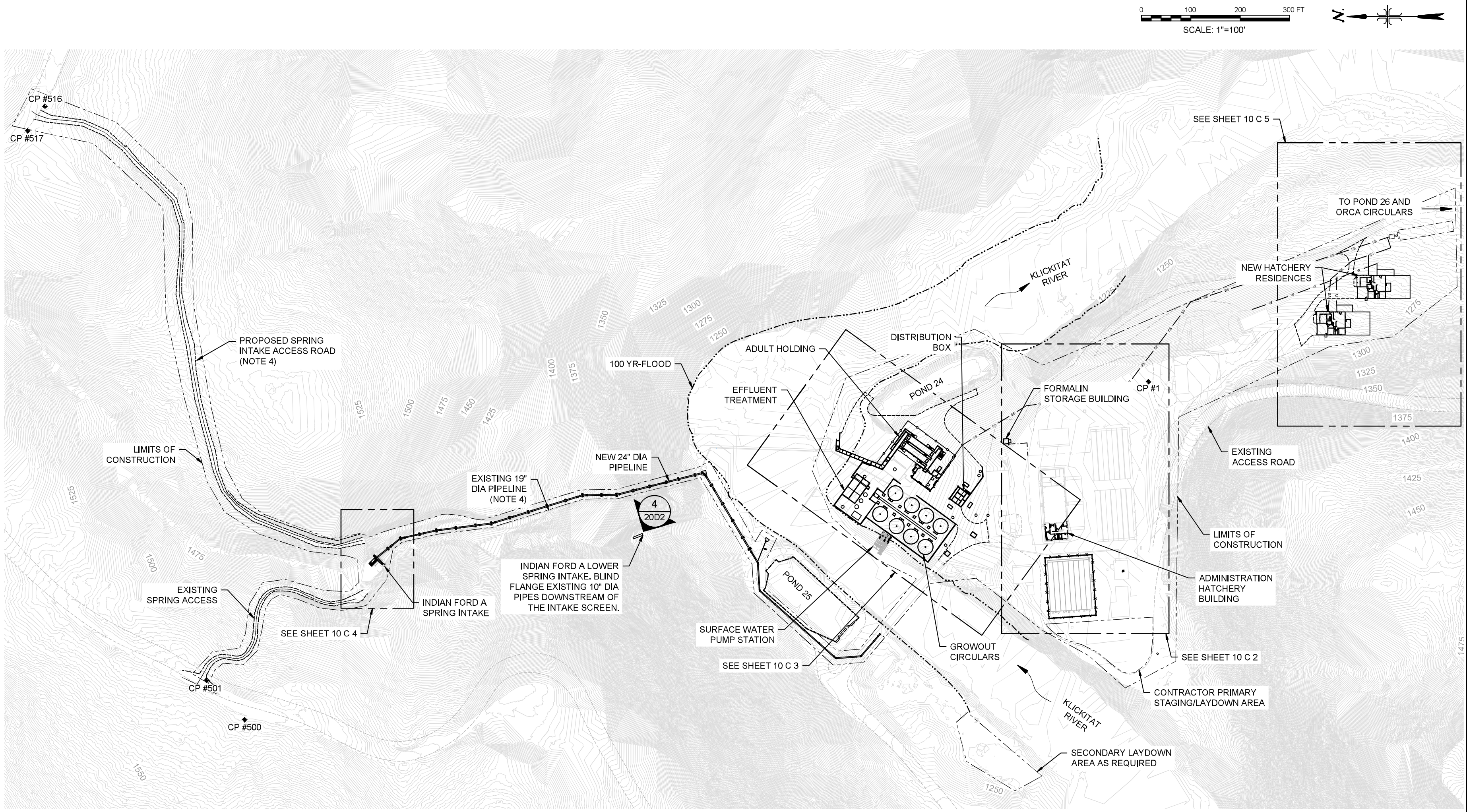
330 S. 5th Street, Suite 510 | Boise, Id 83702
Phone: 208-331-0738
schnabel-eng.com

KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

SITE PHOTOS

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET
10 D 3

8/31/2022 5:18 PM B:\BONNEVILLE POWER ADMINISTRATION\21C27008.00--KLICKITAT HATCHERY\DGE PROJECTS\BJC-ACAD\V10 D 1 - 10 D 3.DWG



CONTROL TABLE

NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	N 258622.00	E 1467204.38	1283.16	WP
500	N 260452.56	E 1466519.73	1527.93	WP PSE ½"
501	N 260529.67	E 1466599.62	1527.84	WP PSE ½"
516	N 260856.93	E 1467762.02	1593.6	WP PSE ½" RBR
517	N 260891.85	E 1467712.50	1592.19	WP PSE ½" RBR

AREA DESCRIPTIONS

AREA 10 SITE
AREA 20 INDIAN FORD A SPRING PIPELINE
AREA 30 SURFACE WATER PUMP STATION
AREA 40 DISTRIBUTION BOX
AREA 50 ADULT HOLDING AND SPAWNING
AREA 60 GROWOUT CIRCULARS
AREA 70 POLLUTION ABATEMENT POND
AREA 80 ADMINISTRATION BUILDING EXPANSION
AREA 90 HATCHERY RESIDENCE
AREA 100 RACEWAY BANK C PREDATOR CONTROL

PLAN VIEW

SCALE: 1" = 100'

NOTES:

1. SURVEY WITHIN THE LIMITS OF CONSTRUCTION COMPLETED BY PIONEER SURVEYING-ENGINEERING OF GOLDENDALE, WA IN AUGUST 2021. ADDITIONAL LIDAR SURVEY SHOWN FROM WASHINGTON STATE DEPARTMENT OF NATURAL RESOURCES.
2. HORIZONTAL DATUM - WASHINGTON STATE PLANE, SOUTH ZONE, NAD83, US SURVEY FEET.
3. VERTICAL DATUM - NAVD 88 USING GEOID 18.
4. TREE REMOVAL MAY BE NECESSARY ALONG PROPOSED SPRING ACCESS ROAD AND PIPELINE DURING CONSTRUCTION. ALL SUCH TREES SHALL BE MARKED AND APPROVED FOR REMOVAL BY OWNER PRIOR TO REMOVAL. ALL CONSTRUCTION ACTIVITIES IN THESE AREAS SHALL BE COORDINATED WITH BPA AND YN ARCHAEOLOGISTS.

REV.	DESCRIPTION	DATE

DESIGNED BY: BJC | DRAWN BY: BJY | CHECKED BY: JRE

DATE:________

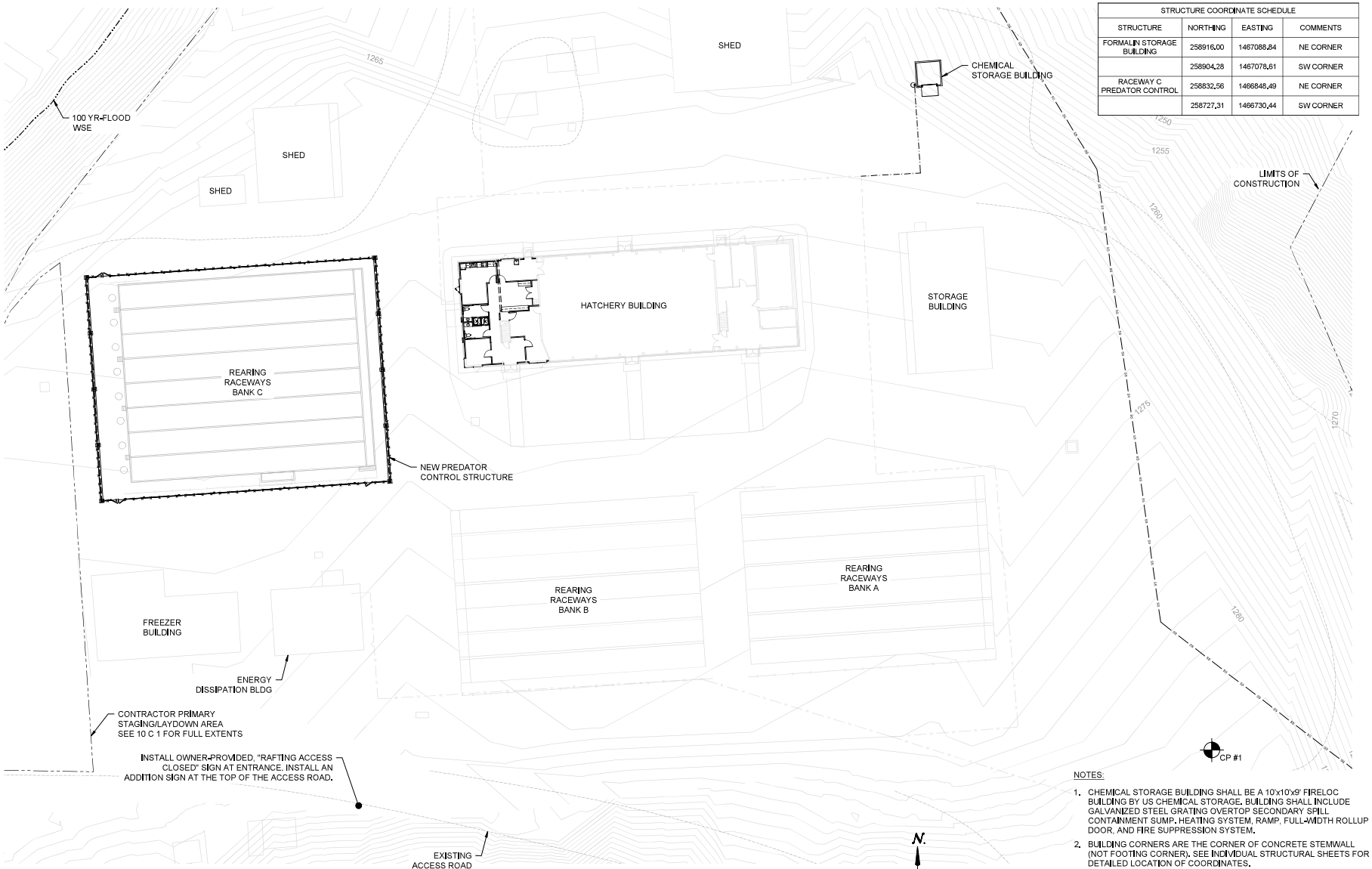
STATE PROFESSIONAL ENGINEER NO. XXXXX

Schnabel ENGINEERING
250 S. 5th Street, Suite 510 / Boise, Id 83702
Phone: 208-331-9736
schnabel-eng.com

KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

OVERALL SITE PLAN

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET
10 C 1



STRUCTURE COORDINATE SCHEDULE			
STRUCTURE	NORTHING	EASTING	COMMENTS
FORMALIN STORAGE BUILDING	258916.00	1467088.84	NE CORNER
	258904.28	1467078.61	SW CORNER
RACEWAY C PREDATOR CONTROL	258832.56	1466848.49	NE CORNER
	258727.31	1466730.44	SW CORNER

NOTES:

1. CHEMICAL STORAGE BUILDING SHALL BE A 10'x10'x9' FIRELOC BUILDING BY US CHEMICAL STORAGE. BUILDING SHALL INCLUDE GALVANIZED STEEL GRATING OVERTOP SECONDARY SPILL CONTAINMENT SUMP. HEATING SYSTEM, RAMP, FULL-WIDTH ROLLUP DOOR, AND FIRE SUPPRESSION SYSTEM.
2. BUILDING CORNERS ARE THE CORNER OF CONCRETE STEMWALL (NOT FOOTING CORNER). SEE INDIVIDUAL STRUCTURAL SHEETS FOR DETAILED LOCATION OF COORDINATES.

PLAN VIEW
SCALE: 1" = 20'

0 10 20 40 60 FT
SCALE: 1"=20'

NO.	DESCRIPTION	DATE

DESIGNED BY: BJC
DRAWN BY: BJT
CHECKED BY: JRE

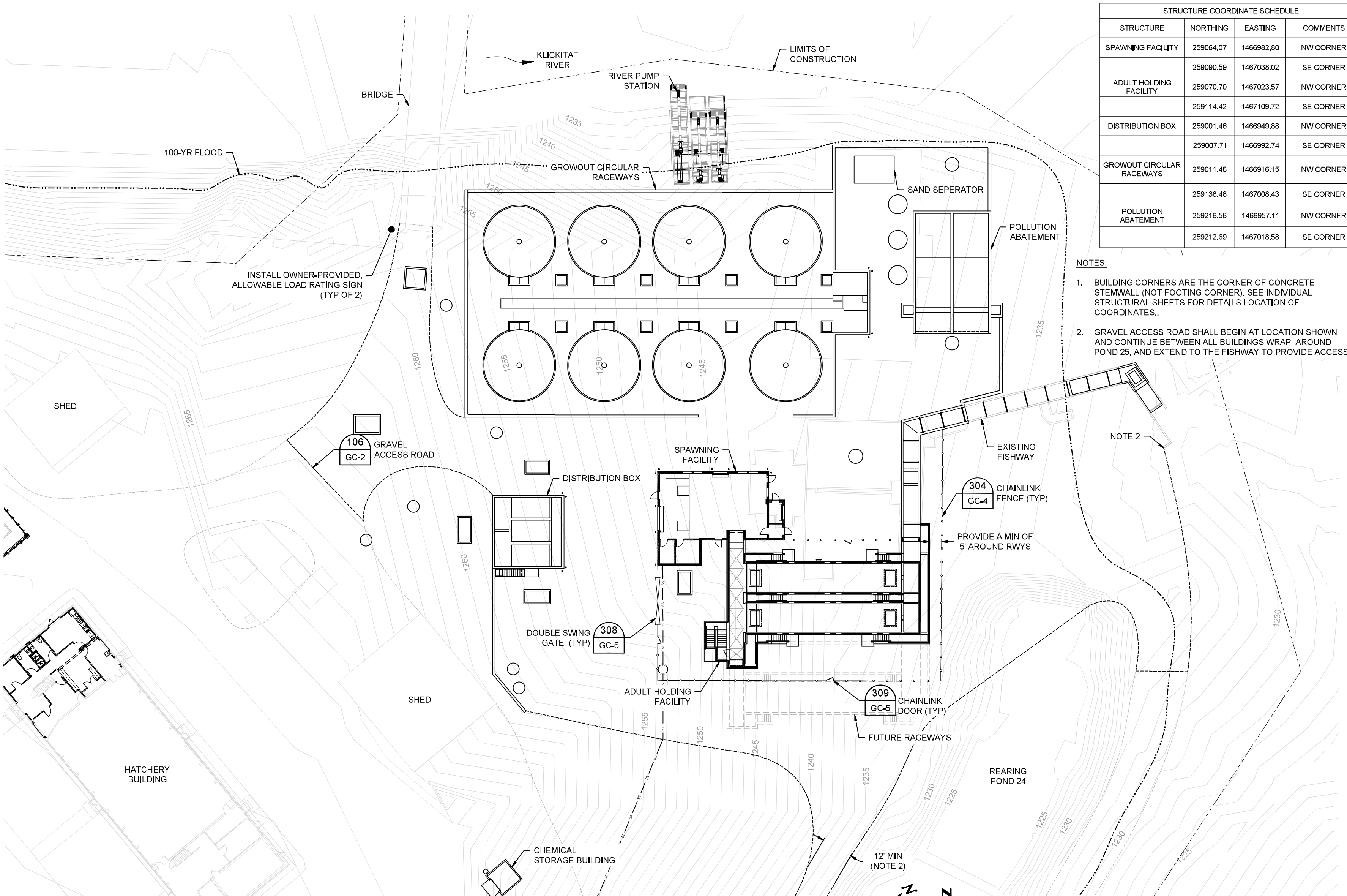
STATE PROFESSIONAL ENGINEER NO. XXXXX
DATE

Schnabel ENGINEERING
330 S. 5th Street, Suite 510 | Boise, Id 83702
Phone: 208-331-0738
schnabel-eng.com

KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

ENLARGED SITE PLAN - I

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET
10 C 2



PLAN VIEW
SCALE: 1" = 20'

0 10 20 40 60 FT
SCALE: 1"=20'

STRUCTURE COORDINATE SCHEDULE			
STRUCTURE	NORTHING	EASTING	COMMENTS
SPAWNING FACILITY	259064.07	1466982.80	NW CORNER
	259090.59	1467038.02	SE CORNER
ADULT HOLDING FACILITY	259070.70	1467023.57	NW CORNER
	259114.42	1467109.72	SE CORNER
DISTRIBUTION BOX	259001.46	1466949.88	NW CORNER
	259007.71	1466992.74	SE CORNER
GROWOUT CIRCULAR RACEWAYS	259011.46	1466916.15	NW CORNER
	259138.48	1467008.43	SE CORNER
POLLUTION ABATEMENT	259216.56	1466957.11	NW CORNER
	259212.69	1467018.58	SE CORNER

NOTES:

1. BUILDING CORNERS ARE THE CORNER OF CONCRETE STEMWALL (NOT FOOTING CORNER), SEE INDIVIDUAL STRUCTURAL SHEETS FOR DETAILS LOCATION OF COORDINATES..
2. GRAVEL ACCESS ROAD SHALL BEGIN AT LOCATION SHOWN AND CONTINUE BETWEEN ALL BUILDINGS WRAP, AROUND POND 25, AND EXTEND TO THE FISHWAY TO PROVIDE ACCESS.

REV.	DESCRIPTION	DATE

DESIGNED BY: BJC
DRAWN BY: BJY
CHECKED BY: JRE

DATE:________
STATE PROFESSIONAL ENGINEER NO. XXXXX

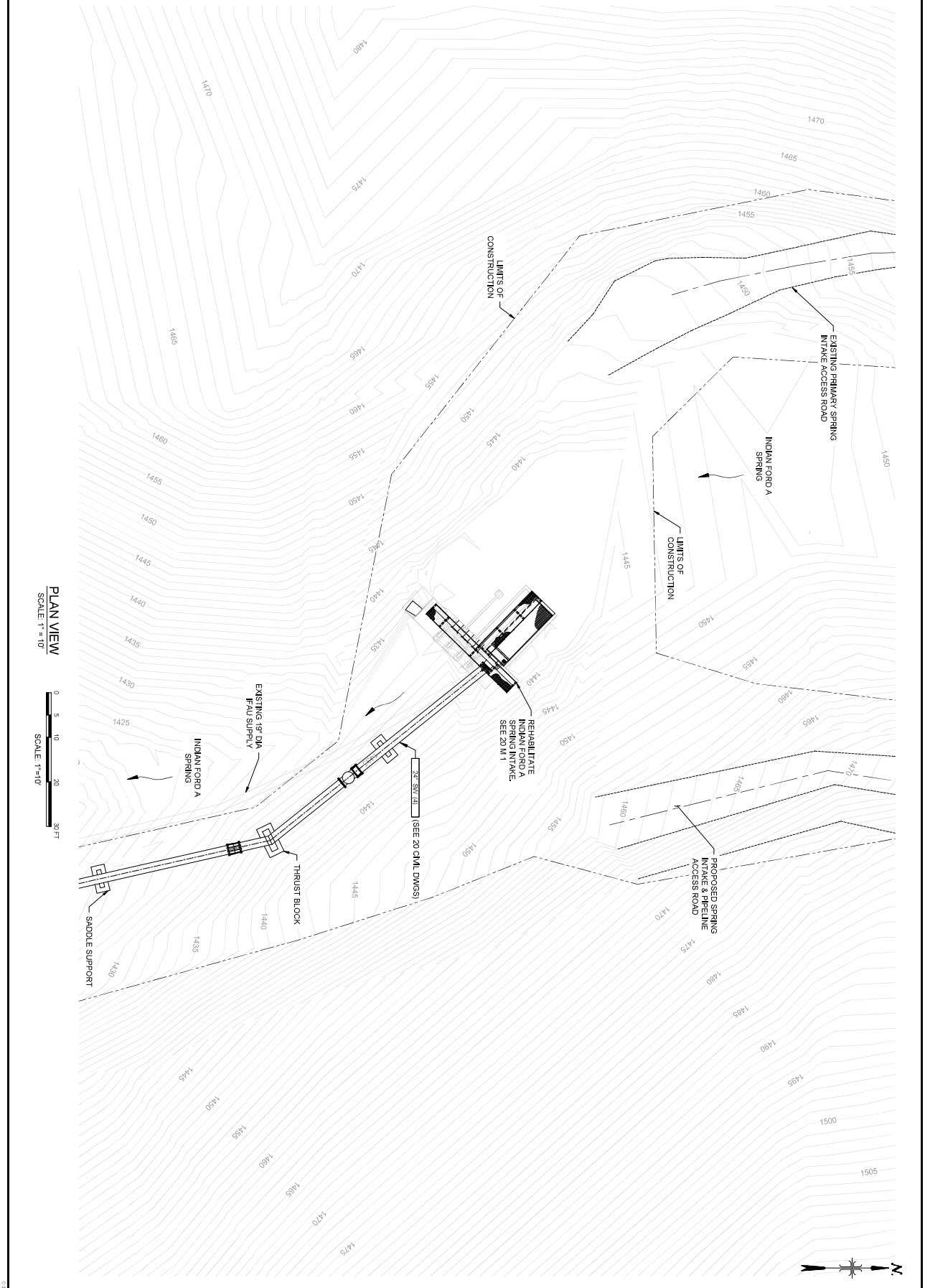
Schnabel ENGINEERING
250 S. 5th Street, Suite 510 / Boise, Id 83702
Phone: 208-331-9736
schnabel-eng.com

KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

ENLARGED SITE PLAN - II

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET 10 C 3

8/31/2022 5:18 PM B:\BONNEVILLE POWER ADMINISTRATION\21C27008.00 - KLICKITAT HATCHERY\03-SE PRODUCTS\08-CADICIM\10 C 1 - 10 C 5.DWG



PLAN VIEW
SCALE: 1" = 10'

SCALE: 1"=10'
0 5 10 20 30 FT

KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

ENLARGED SITE PLAN - III

Schnabel ENGINEERING
250 S. 5th Street, Suite 510 / Boise, Id 83702
Phone: 208-331-6736
schnabel-eng.com

DESIGNED BY: BJC | DRAWN BY: BJY | CHECKED BY: JRE

DATE:_____
STATE PROFESSIONAL ENGINEER NO. XXXXX

REV.	DESCRIPTION	DATE

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET: 10 C 4

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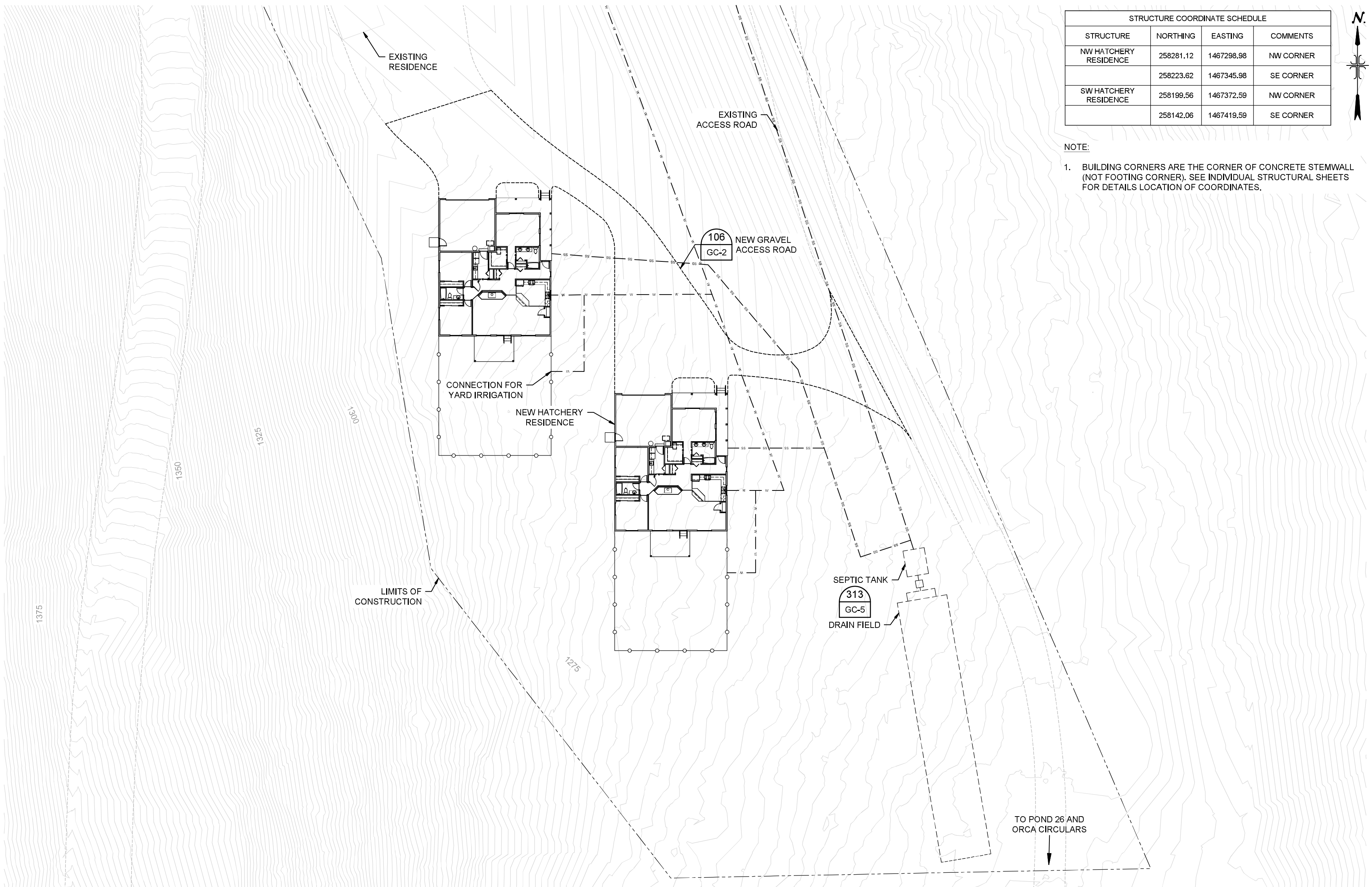

PLAN VIEW
SCALE: 1" = 20'

0 10 20 40 60 FT
SCALE: 1"=20'

STRUCTURE COORDINATE SCHEDULE			
STRUCTURE	NORTHING	EASTING	COMMENTS
NW HATCHERY RESIDENCE	258281.12	1467298.98	NW CORNER
	258223.62	1467345.98	SE CORNER
SW HATCHERY RESIDENCE	258199.56	1467372.59	NW CORNER
	258142.06	1467419.59	SE CORNER

NOTE:

1. BUILDING CORNERS ARE THE CORNER OF CONCRETE STEMWALL (NOT FOOTING CORNER). SEE INDIVIDUAL STRUCTURAL SHEETS FOR DETAILS LOCATION OF COORDINATES.

REV.	DESCRIPTION	DATE

DESIGNED BY: BJC
DRAWN BY: BJY
CHECKED BY: JRE

DATE:_______
STATE PROFESSIONAL ENGINEER NO. XXXXX

Schnabel ENGINEERING
250 S. 5th Street, Suite 510 / Boise, Id 83702
Phone: 208-331-9736
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KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

ENLARGED SITE PLAN - IV

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET
10 C 5

RETAINING WALL COORDINATE SCHEDULE		
PT.	NORTHING	EASTING
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102	259257.97	1466954.13
103	259242.24	1466975.77
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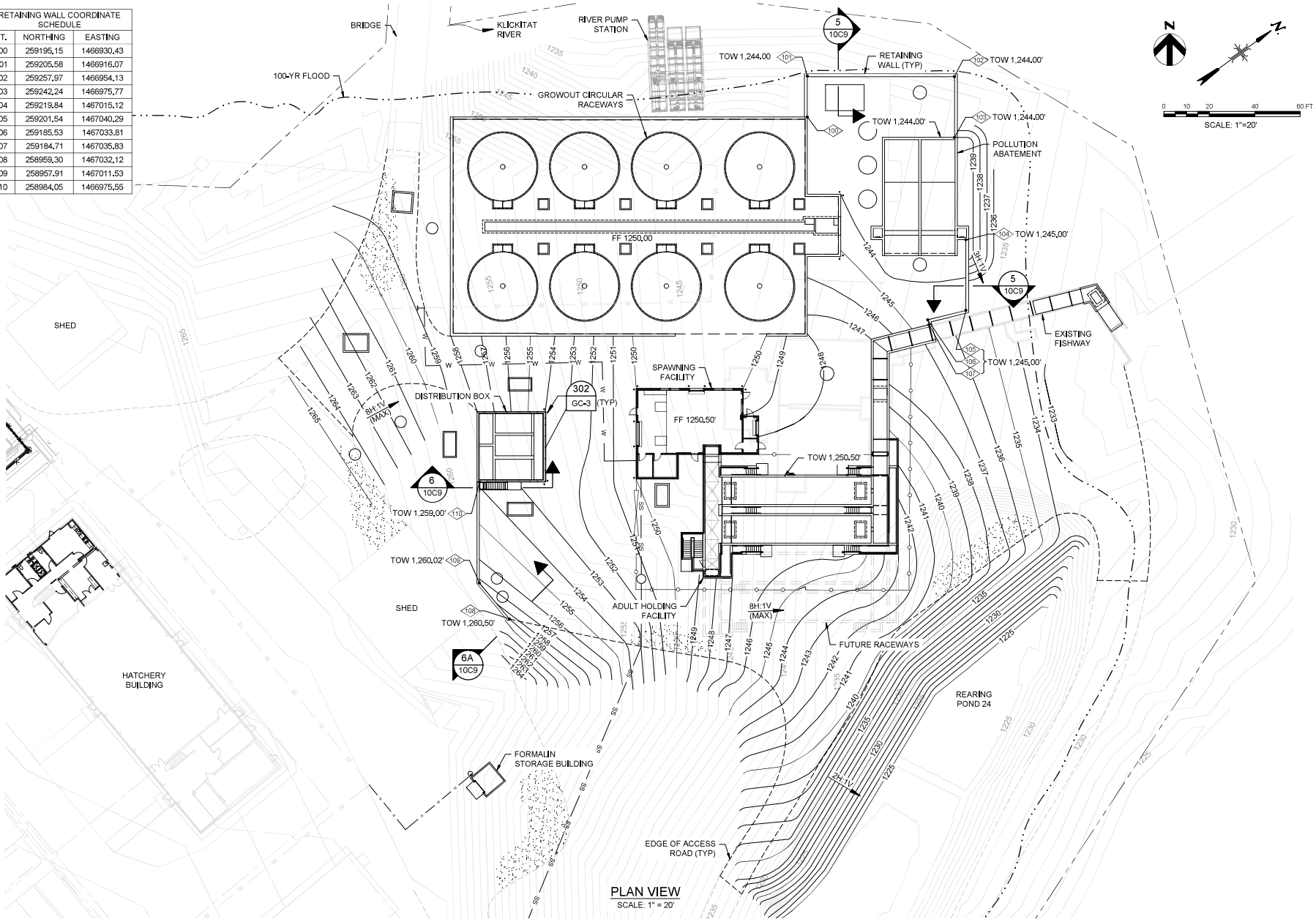

PLAN VIEW
SCALE: 1" = 20'

Schnabel ENGINEERING
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KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

PAVING, GRADING AND DRAINAGE PLAN

PROJECT: 21C27008.00
DATE: 8/31/2022
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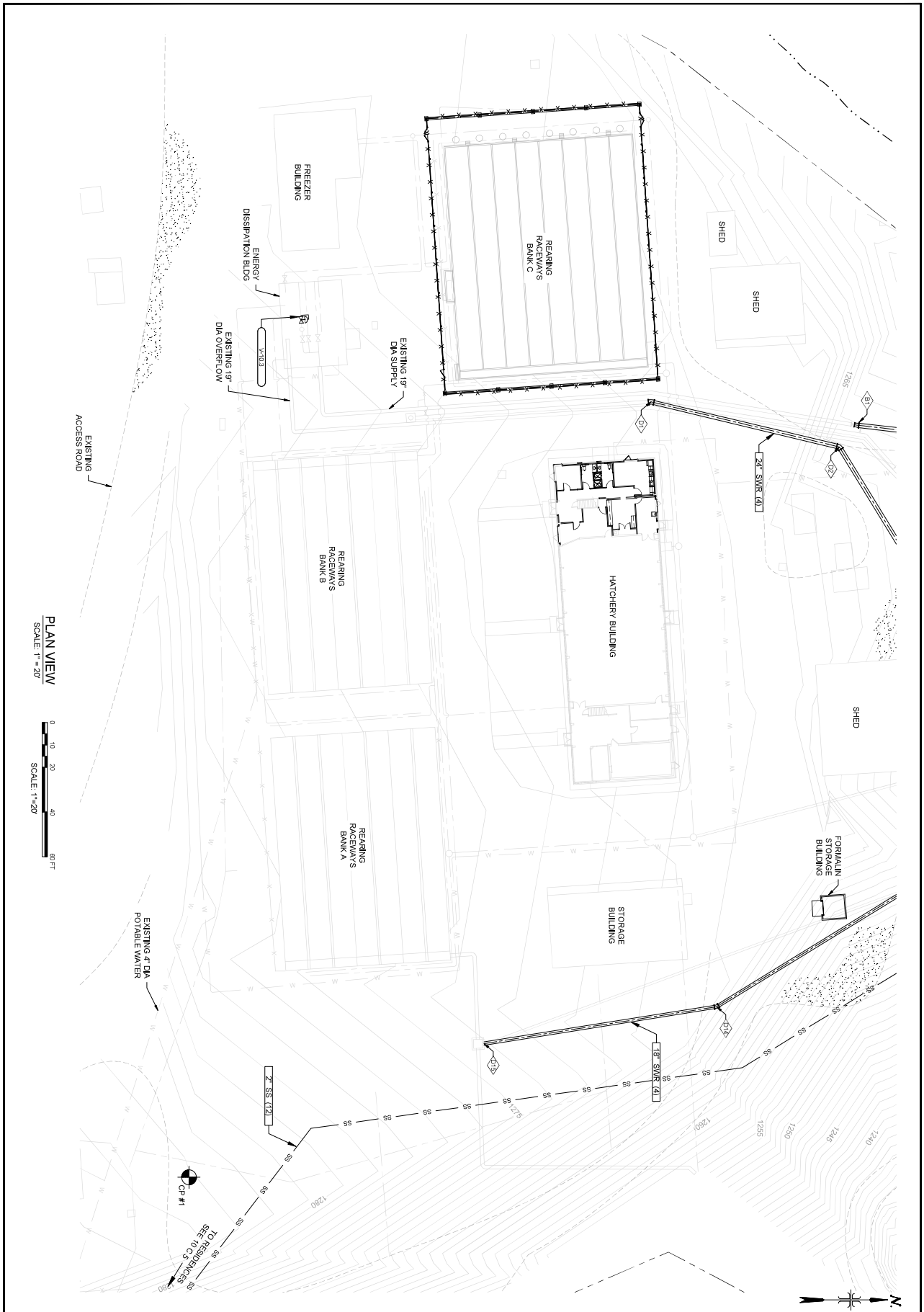

PLAN VIEW
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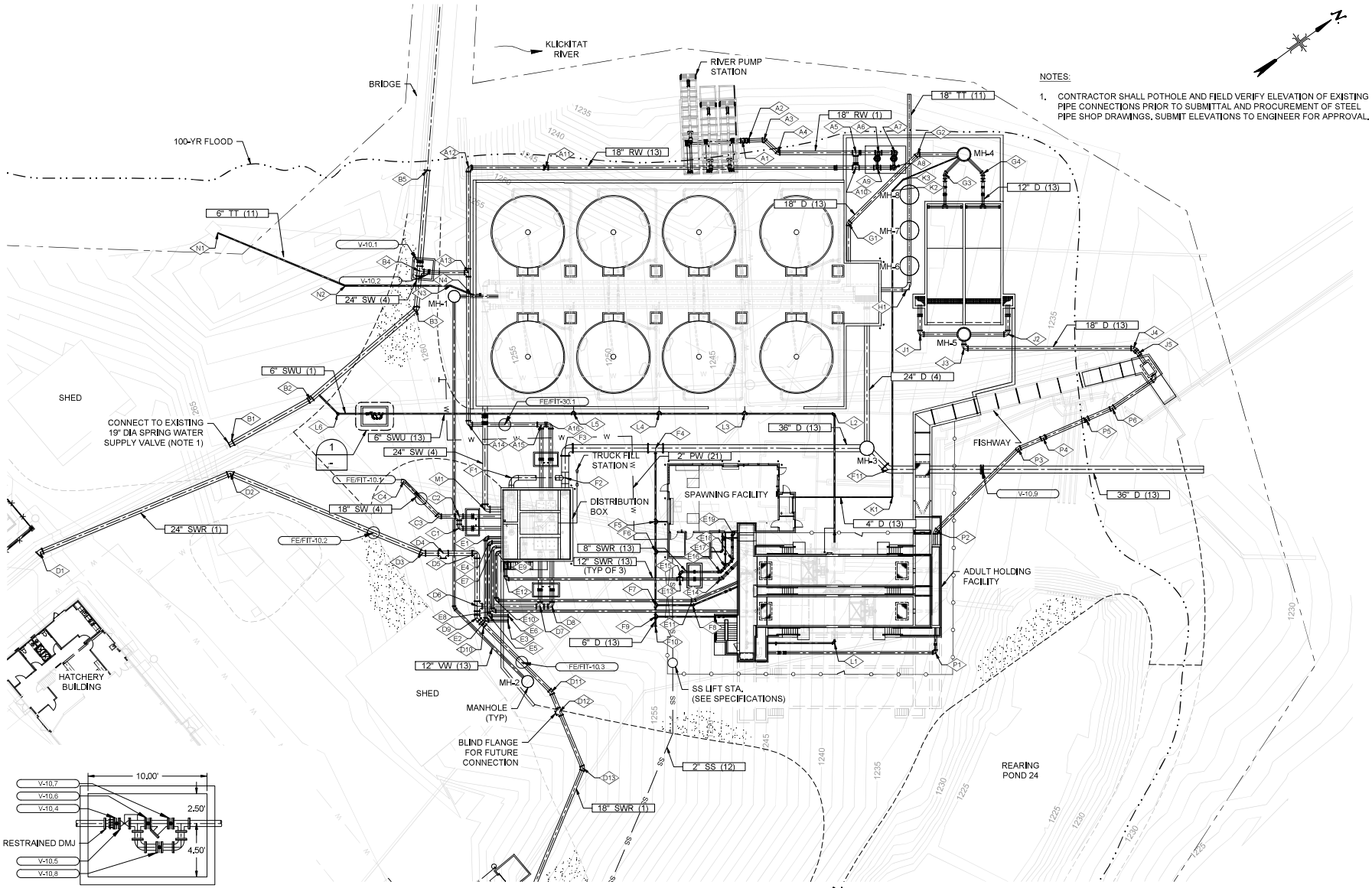
KLICKITAT HATCHERY RENOVATION BONNEVILLE POWER ADMINISTRATION GLENWOOD, WASHINGTON	Schnabel ENGINEERING 250 S. 5th Street, Suite 510 / Boise, Id 83702 Phone: 208-331-6736 schnabel-eng.com	DESIGNED BY: BJC	DRAWN BY: BJY
YARD PIPING PLAN - I		CHECKED BY: JRE	DATE: STATE PROFESSIONAL ENGINEER NO. XXXXX

REV.	DESCRIPTION	DATE

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET: 10 C 7



DESCRIPTION	DATE

DESIGNED BY: BJC
DRAWN BY: BJT
CHECKED BY: JRE
STATE PROFESSIONAL ENGINEER NO. XXXXX
DATE

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KLICKITAT HATCHERY RENOVATION
BONNEVILLE POWER ADMINISTRATION
GLENWOOD, WASHINGTON

YARD PIPING PLAN - II

PROJECT: 21C27008.00
DATE: 8/31/2022
SHEET
10 C 8

APPENDIX C: 2019 WETLAND DELINEATION REPORT AND JURISDICTIONAL DETERMINATION

Klickitat Hatchery

Wetland Delineation Report

Revised September 2019

Wetland Delineation Summary

Project Name:	Bonneville Power Administration Klickitat Hatchery
Location:	Klickitat and Yakima Counties, Washington (46.04249, -121.184)
PLSS Description:	Township 6N, Range 13E, Section 4
Study Area:	The study area is located just north of the Glenwood Highway and west of the city of Glenwood, in Klickitat County, Washington. The total study area is approximately 19.47 acres.
Owner:	Yakama Nation Indian Tribe
Previous Delineations:	None known to have been officially submitted to Washington Department of Ecology or U.S. Army Corps of Engineers
Elevation:	1,280 feet above mean sea level
Hydrology:	WRIA #30 – Klickitat Watershed (Ecology 2017) 17070106 Upper Yakima HUC 8 (USGS 2017) Primary hydrology sources are riverine inundation and surface runoff; secondary sources include direct precipitation and groundwater seepage
Soils:	Yedlick Stony Ashy Sandy Loam, 30 to 45 percent slopes, non-hydric; Fluventic Haploxerolls-Riverwash complex, 0 to 5 percent slopes, non-hydric;
Wetland Types:	Cowardin class: None; Hydrogeomorphic (HGM) class: Depressional
Floodplain:	Within the floodway and the 100-year floodplain of the Klickitat River; Shoreline Category is Conservancy
City Land Use/ Zoning:	Service Governmental
Project Staff:	Travis Kessler
Field Dates:	May 31, 2018, May 1, 2019
Determination:	2 wetland complexes (Wetland A, 0.16 acres and Wetland B, 0.001 acres), 1 stream (Indian Ford A Spring), one river (Klickitat River), 5 constructed ponds (1 pond with a fish ladder and 1 pond with an outfall)
State Categories:	Category IV wetland

NOTE: The cover is a photograph of looking upstream at the Klickitat River from the bridge.

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1.0 INTRODUCTION

The Bonneville Power Administration (BPA) performed a wetland and ordinary high water mark (OHWM) delineation at the Klickitat Salmon Hatchery property owned by WDFW, which is located on the Yakama Indian Reservation in Klickitat and Yakima Counties, Washington (Figure 1). BPA conducted the delineation in support of its proposal to support upgrades to the hatchery facilities, including upgrades to the existing intake pipes at Indian Ford A Spring.

BPA professional wetland scientist Travis Kessler performed the wetland delineation fieldwork during two field visits on May 31, 2018 and May 1, 2019. A meeting with the USACE and EPA was also held during the May 1, 2019 field visit to review and discuss the delineated wetland and waters boundaries and also discuss the project and a permitting strategy moving forward. Mr. Kessler prepared this delineation report to summarize the findings of this field investigation. This wetland delineation was performed in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (September 2008) and applicable federal, state, and local ordinances.

The wetland boundaries described in this report are based on BPA's best professional judgement based on the site conditions encountered at the time of the field investigation. Appendix E contains the Jurisdictional Determination Request for the wetlands and waters described within this wetland delineation report.

2.0 STUDY AREA DESCRIPTION

2.1 Location

The study area is located at the Klickitat Hatchery approximately 7 miles east of Glenwood, in Klickitat and Yakima Counties, Washington at RM 42 of the Klickitat River (Figure 2). The legal description of the site location is: Township 6 North, Range 13 East, Section 4, NE ¼. The study area includes Tax Lots 06130400000100, 06130400000200 and 13073399993.

2.2 Site Description

The study area includes the Klickitat Salmon Hatchery, a portion of the Klickitat River and adjacent land to the north in the location of the existing pipeline. The Klickitat River divides the study area in half. The southern half contains the hatchery complex and several rearing ponds and the northern half contains one rearing pond and a pipeline that runs from the hatchery up a steep forested hillside along Indian Ford A Spring.

According to topographic data collected at the study area, elevation within study area is approximately 1,280 feet above mean sea level. The attached figures show the study area in the context of the USGS topographical layer (Figure 1), the National Wetland Inventory layer (NWI) (Figure 3), and the Klickitat County soil map unit layer (Figure 4).

2.3 Climate

According to the Soil Survey of Klickitat County Area, Washington (Brincken 2009), in summer, the average temperature in the vicinity of the study area is 59° Fahrenheit (F) degrees and the average daily maximum temperature is 80°F. In winter, the average temperature is 30°F and the average daily minimum temperature is 24°F. The total annual precipitation is about 16 inches. Most of this precipitation falls in the form of rain

or snow between November and February. Thunderstorms occur on about 7 days each year during the summer. The average seasonal snowfall is about 10 inches.

Precipitation data from Yakima, Washington was used to determine the current and percent normal rainfall for the May 31, 2018 site visit (Table 1) and May 1, 2019 site visit (Table 2). This was used because it was the closest station that possessed both daily and monthly observed rainfall data as well as WETS data (NRCS 2017b), which is used to determine the average monthly data. Precipitation amounts are considered normal when they fall between figures for which there is a 30% chance of more than that amount and a 30% chance of less than that amount. The water year is a period of 12 months for which precipitation totals are measured and is typically defined as the period between October 1 of one year and September 30 of the next year (U.S. Geological Survey 2011).

Table 1. Observed and Normal Monthly Precipitation (inches) at Yakima, Washington

Month	Yakima, WA Actual[1]	Yakima, WA 1971-2000[2]			% of Average	Above or Below Normal
		30% chance will have		Average		
		Less than	More than			
February 2018	0.18	0.49	0.96	0.80	23%	Below
March 2018	0.38	0.31	0.85	0.70	54%	Below
April 2018	0.75	0.19	0.62	0.53	142%	Above
May 2018	0.13	0.25	0.63	0.51	25%	Below
Water Year Through May 31, 2018	**4.63**	**3.34**	**8.11**	**6.7**	**69%**	**Below Normal**

[1] Monthly actual precipitation was obtained from National Weather Service Forecast Office website (2019) from the Yakima, WA location for the water year, which is based on an October 1 start date.
[2] Average monthly data from WETS data from station at Yakima, WA.

The analysis shown within Table 1 demonstrates that overall, precipitation was below normal leading up to the May 31, 2018 field investigation at the study area.

Table 2. Observed and Normal Monthly Precipitation (inches) at Yakima, Washington

Month	Yakima, WA Actual[1]	Yakima, WA 1971-2000[2]			% of Average	Above or Below Normal
		30% chance will have		Average		
		Less than	More than			
January 2019	1.42	0.60	1.47	1.20	118%	Above
February 2019	1.85	0.49	0.96	0.80	231%	Above
March 2019	-	0.31	0.85	0.70	-	-
April 2019	0.68	0.19	0.62	0.53	128%	Above
Water Year Through May 1, 2019	**6.12**	**3.38**	**8.1**	**6.69**	**91%**	**Normal**

[1] Monthly actual precipitation was obtained from National Weather Service Forecast Office website (2019) from the Yakima, WA location for the water year, which is based on an October 1 start date.
[2] Average monthly data from WETS data from station at Yakima, WA.

According to Table 2, the analysis demonstrates that overall, precipitation was above normal in the several months prior to the May 1, 2019 field investigation at the study

area. However, precipitation for the water year through the May 1, 2019 field investigation is normal.

2.4 Hydrology

The study area is located within the Klickitat Water Resource Inventory Area (WRIA #30) (Ecology 2017). The study area is on higher elevation foothills above the Columbia River Gorge and contains the Klickitat River flowing through the center of the property in a deep valley. The north portion of the study area contains a steep gradient stream known as Indian Ford A Spring, which flows down the hillside from north-south direction (Figure 5). At the base of the stream above its confluence with the Klickitat River is a depressional wetland that receives hydrology during high flow events such as high rainfall or snowmelt. An outfall known as Rearing Pond 24 Outfall is located in the southeast portion of the study area that flows out of Rearing Pond 24 (Figure 5). Hydrologic input to the Rearing Pond 24 stems from a large culvert directing water from the Klickitat River into the pond.

Hydrology at the site is driven mostly by precipitation, runoff and groundwater seepage from the surrounding hills, and riverine inundation from one tributary stream and the Klickitat River.

2.5 Soils

The Soil Survey of Klickitat County Area, Washington (Brincken 2009) identifies the northern portion of the study area soil as Yedlick stony ashy sandy loam, 8 to 30 percent slopes and 30 to 45 percent slopes (Figure 4), which is non-hydric. The southern portion of the study area surrounding the Klickitat Salmon Hatchery is mapped as Fluventic Haploxerolls-Riverwash complex, 0 to 5 percent slopes, which is also non-hydric.

2.6 Plant Communities

The uplands within the study area are dominated by Douglas fir (*Pseudotsuga menziesii*, FACU), ponderosa pine (*Pinus ponderosa*, FACU), western red-cedar (*Thuja plicata*, FAC), vine maple (*Acer circinatum*, FAC), common snowberry (*Symphoricarpos albus*, FACU), Oregon white oak saplings (*Quercus garryana*, UPL), Saskatoon serviceberry (*Amelanchier alnifolia*, FACU), tall fescue (*Schedonorus arundinaceus*, FACU), western bracken fern (*Pteridium aquilinum*, FACU), narrow-leaf fireweed (*Chamaenerion angustifolium,* FACU), and common horsetail (*Equisetum arvense*, FAC).

Wetland A is dominated by red-osier dogwood (*Cornus alba*, FACW), cluster rose (*Rosa pisocarpa*, FAC), common spikerush (*Eleocharis palustris*, OBL), western water hemlock (*Cicuta douglasii*, OBL), giant helleborine (*Epipactis gigantea*, OBL), Rocky Mountain iris (*Iris missouriensis*, FACW), hardstem bulrush (*Schoenoplectus acutus*, OBL), panicled bulrush (*Scirpus microcarpus*, OBL), common horsetail, softrush (*Juncus effusus*, FACW), and fringed willowherb (*Epilobium ciliatum*, FACW).

Wetland B is dominated by red alder (*Alnus rubra,* FAC), Nootka rose (*Rosa nutkana,* FAC), common horsetail, slough sedge (*Carex obnupta*), trailing blackberry (*Rubus ursinus*), softrush and Kentucky bluegrass (*Poa pratensis*).

2.7 Disturbance History

The initial construction of the Klickitat Salmon Hatchery occurred between 1949 and 1951, which included the main hatchery building, garage, hatchery ponds, fish ladder,

raceways, and 5 houses. Renovation and new construction occurred in the 1980's, which included storage buildings, new raceways, and new ponds.

The Klickitat River has evidence of riprap armoring used for bank stabilization that was likely placed during the initial buildout of the hatchery complex. During the construction of the hatchery complex, fill material was likely used to build up the base flood elevation to protect the hatchery from flooding that occurs as a result of high water events during winter rains and/or spring snowmelt periods.

3.0 METHODS

BPA conducted this delineation using the Routine Determination Method described in 1987 Corps of Engineers Wetlands Delineation Manual and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (USACE 2008). The Routine Determination Method examines three criteria: hydrology, vegetation, and soils, to determine if jurisdictional wetlands are present within the study area. Sample plot locations were selected to best characterize the wetland boundary and conditions at the site.

Prior to the field investigation, BPA reviewed existing data and information including the following:

- National Wetland Inventory (NWI) data (USFWS 2017);
- Soil Survey of Klickitat County, Washington (Brincken 2009),
- Soil map unit descriptions and hydric soil classification (NRCS 2017);
- Aerial photographs on ArcGIS and Google Earth Pro (Google Earth Pro 2017); and
- National Hydrography Dataset (USGS 2015).

3.1 Hydrology

During the field investigation, BPA documented field observations of primary and secondary hydrology indicators on wetland determination data forms (Appendix A). Wetland sample plots were collected near or in areas with standing water. Paired upland sample plots were collected in areas slightly higher in elevation without obvious hydrology indicators such as surface water or saturation of soils.

3.2 Soils

The wetland and upland soil plots were excavated to a depth of between 16 and 20 inches. A couple of the soil pits could not be excavated to the standard depth of 18 inches because rock or wood chunks prevented further excavation. Soil color, texture, presence of redoximorphic features and other soil characteristics were documented according to the procedures described in the Regional Supplement (USACE 2008).

3.3 Vegetation

Vegetation was characterized for the uplands and wetland areas and recorded at each sample plot. The vegetation was examined in three strata: herbaceous ground cover, shrubs, and trees. Woody vines were absent from the study area. Visual estimates of percent cover of each species occurring within a sample plot were made for each stratum. Dominant species were determined using the 50/20 rule. Dominant plant species for each stratum are those that cumulatively make up the most abundant 50 percent (relative cover per stratum), plus any additional species with 20 percent or more relative cover. The wetland indicator status for each dominant plant species was used to determine the presence or absence of a wetland (hydrophytic) plant community based

on the National Wetland Plant List (Lichvar et. al. 2016). Nomenclature used in this report is based on the 2016 National Wetland Plant List.

3.4 Growing Season

The Natural Resources Conservation Service (NRCS) currently defines the growing season as that portion of the year when soil temperatures at 20 inches below the soil surface are higher than biological zero (41°F or 5°C). When soil temperature data are not available, the Regional Supplement allows using the closest and best available weather station data to estimate the length of the growing season based on a 50% probability of a temperature of 28°F or higher.

Based on the 28° standard and climatic data for Mt. Adams, Washington (NRCS 2017b), the growing season is approximately 139 days at least 50 percent of the time, extending from May 15 to October 1. The field investigation occurred within the official growing season. The abundance of flourishing grasses and forbs identified during the site visit confirms that fieldwork was conducted inside the actual growing season.

3.5 National Wetland Inventory

According to the NWI (USFWS 2017), the classification codes assigned to areas within the study area are PUBHx (Palustrine Unconsolidated Bottom, Permanently Flooded, Excavated), L1UBHh (Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded), and R3UBH (Riverine, Upper Perennial, Unconsolidated Bottom, Permanently Flooded) (Figure 3). The two manmade hatchery ponds that are excavated out of non-hydric soils are mapped as PUBHx. We do not agree with the accuracy of this mapping since these areas are manmade ponds excavated out of non-hydric soils for the purposes of the hatchery operation. The stream in the north portion of the site is mapped R3UBH. The Klickitat River is mapped as L1UBHh in the west portion of the site and R3UBH in the east portion of the site. We do not agree with the L1UBHh mapping of the river in the west portion of the site because the river is not impounded within this area and has a similar riffle/pool dynamic as the section of river in the east portion of the site.

4.0 RESULTS

BPA identified two wetlands (Wetlands A and B), the Klickitat River, one stream (Indian Ford A Spring), one outfall (Rearing Pond 24 Outfall), one fish ladder (connected to Hatchery Pond), and five ponds (Rearing Pond 24, Hatchery Pond 25, Hatchery Pond, Pollution Abatement Pond and Adult Holding Pond) within the study area (Figure 5).

4.1 Wetland A

Wetland A is a 0.16-acre wetland complex within the study area, that lies along the west side of the southern terminus of Indian Ford A Spring near its confluence with the Klickitat River (Photographs 1 and 2). A steep rocky hillslope defines the north boundary, a gravel road and fill material defines the south and west boundaries, and the east portion is hydrologically connected to Indian Ford A Spring through groundwater seepage and overbank flooding during high flow events. Due to its hydrological connection with Indian Ford A Spring, we believe Wetland A is likely to be federally jurisdictional.

The Priority Habitat and Species (PHS) data (WDFW 2018) shows that areas in the vicinity of Wetland A provide habitat for the northern spotted owl and mule and black

tailed deer. Within the Klickitat River, adjacent to the study area, there are bull trout, spring and fall Chinook, Coho, summer and winter steelhead, rainbow trout, and resident coastal cutthroat trout.

4.1.1 Hydrology

Primary hydrology sources within Wetland A are riverine inundation and surface runoff; secondary sources are direct precipitation and groundwater seepage. During the field investigation, the main source of surface water discharge stemmed from groundwater seepage from the hillslope above the wetland. Indian Ford A Spring flows into the Klickitat River via culvert immediately south of the area where it connects to Wetland A.

During the field investigation, primary indicators of wetland hydrology observed at the wetland sample plots (SP-1 and SP-3) included: surface water (A1); high water table (A2); saturation (A3); and hydrogen sulfide odor (C1). Secondary indicators of wetland hydrology included: drainage patterns (B10) and FAC-neutral test.

4.1.2 Soils

Soils within Wetland A were comprised of sandy muck. SP-1 and SP-3 were located with a NRCS soil map unit known to be non-hydric (Yedlick stony ashy sandy loam, 30 to 45 percent slopes). Soil matrix colors within Wetland A entailed 10YR 2/2 with no visible redoximorphic features. The reason redoximorphic features were not visible is likely due to the soils being saturated and being comprised of fine sand and silt. The hydric soil indicator for the examined soils included sandy mucky mineral (S1).

4.1.3 Vegetation

Wetland A is dominated by red-osier dogwood, cluster rose, hardstem bulrush, panicled bulrush, common spikerush. At the wetland sample plots (SP-1 and SP-3), hardstem bulrush had the highest percent coverage for all the strata.

4.2 Wetland B

Wetland B is a 0.001 acre wetland complex within the study area, that lies along the east side of the southern terminus of Indian Ford A Spring near its confluence with the Klickitat River (Photographs 3 and 4). A rocky hillslope defines the north boundary, a gravel road and fill material defines the south, east and west boundaries. Since Wetland B appears to be functionally isolated from the Klickitat River due to the existing road fill material, we believe it is isolated and is unlikely to be federally jurisdictional.

The Priority Habitat and Species (PHS) data (WDFW 2018) shows that areas in the vicinity of Wetland B provide habitat for the northern spotted owl and mule and black tailed deer. Within the Klickitat River, adjacent to the study area, there are bull trout, spring and fall Chinook, Coho, summer and winter steelhead, rainbow trout, and resident coastal cutthroat trout.

4.2.1 Hydrology

Primary hydrology sources within Wetland B are precipitation and surface runoff; secondary sources groundwater seepage. During the field investigation, the main source of surface water discharge stemmed from groundwater seepage from the

hillslope above the wetland. Indian Ford A Spring flows into the Klickitat River via culvert to the west, near its connection with Wetland A.

During the field investigation, primary indicators of wetland hydrology observed at the wetland sample plots (SP-5 and SP-6) included: high water table (A2); saturation (A3); and water stained leaves (B9). Secondary indicators of wetland hydrology included: FAC-neutral test.

4.2.2 Soils

Soils within Wetland B were comprised of sandy muck. SP-5 and SP-6 were located with a NRCS soil map unit known to be non-hydric (Yedlick stony ashy sandy loam, 30 to 45 percent slopes). Soil matrix colors within Wetland B entailed 10YR 2/2 with no visible redoximorphic features. The reason redoximorphic features were not visible is likely due to the soils being saturated and being comprised of fine sand and silt. The hydric soil indicator for the examined soils included sandy mucky mineral (S1).

4.2.3 Vegetation

Wetland B is dominated by red alder, Nootka rose, common horsetail, slough sedge, trailing blackberry, softrush and Kentucky blue grass. At the wetland sample plots (SP-5 and SP-6), red alder had the highest percent coverage for all the strata.

4.3 Klickitat River

The Klickitat River is a large, perennial, anadromous fish bearing river that flows around the north side of the Klickitat Salmon Hatchery complex (Photographs 5 and 6). The Klickitat River is a high gradient river with a riffle to pool scenario, characteristic of mountain streams.

The OHWM of the north and south banks of the Klickitat River was determined on May 31, 2018 by observing bank erosion/channel scour, overbank deposits, drainage patterns, and water marks along existing riprap. The Klickitat River is approximately 80 to 100 feet wide throughout the delineated reach.

Below the OHWM, the vegetation included red alder (*Alnus rubra*, FAC), willow species (*Salix* sp.), and Kentucky bluegrass (*Poa pratensis*, FAC). Above the OHWM were ponderosa pine, honeysuckle (*Lonicera tatarica*, UPL), common horsetail and tall fescue, FACU). Figure 5 depicts the location of the GPS recorded OHWM. Appendix B contains the OHWM field data forms.

4.4 Indian Ford A Spring

Indian Ford A Spring is an unnamed perennial tributary to the Klickitat River that flows in a north-south direction from the north portion of the study area into the Klickitat River immediately northeast of Pond 25 (Photographs 7 to 10). Indian Ford A Spring is hydrologically connected to Wetland A just above its confluence with the Klickitat River, which is evident during high water events with overbank flooding. Upper and lower intake pipes routinely pump water from Indian Ford A Spring to use for their existing hatchery operations, but are in need of replacement (Photograph 11).

The OHWM of Indian Ford A Spring was determined on May 31, 2018 by observing bank erosion/channel scour, drainage patterns, the appearance of clean cobbles/boulders, and evidence of debris along the banks. Indian Ford A Spring averaged between 5 and 8 feet wide throughout the delineated reach.

Below the OHWM, the vegetation included vine maple, northern lady fern (*Athyrium angustum*, FAC), common horsetail, and mosses. Above the OHWM were western red cedar, ponderosa pine, Douglas fir, beaked hazelnut (*Corylus cornuta*, FACU), vine maple, common snowberry, and narrow-leaf fireweed. Figure 5 depicts the location of the GPS recorded OHWM. Appendix B contains the OHWM field data forms.

4.5 Rearing Pond 24 Outfall

Rearing Pond 24 Outfall is a waterbody that flows out of Rearing Pond 24 (Photographs 12 and 13). The outfall is approximately 5 to 10 feet wide and discharges into the Klickitat River approximately 150 feet from Rearing Pond 24. Vegetation growing along the banks of the ditch included red-osier dogwood, tartarian honeysuckle, and common horsetail. Figure 5 depicts the GPS recorded boundaries of the outfall.

4.6 Rearing Pond 24

Rearing Pond 24 is a hatchery pond that was excavated within upland soils for the purpose of rearing juvenile salmonids (Photograph 14). The pond is between 3 and 5 feet deep and has vegetated banks consisting of Nootka rose (*Rosa nutkana*, FAC), and softrush along the wetted perimeter. The drier banks consist of tall fescue, smooth brome, Canada thistle, common dandelion (*Taraxacum officinale*, FACU), and common horsetail. Soils mapped within the area encompassing the pond are Fluventic Haploxerolls-Riverwash complex, 0 to 5 percent slopes. Fluventic Haploxerolls-Riverwash complex is considered to be non-hydric.

We believe rearing pond 24 should be considered to be exempt from federal regulation due to the fact that it's a manmade pond that is excavated within non-hydric soils for the purposes of rearing juvenile salmonids (Figure 4). According to historic aerials that were examined from historicaerials.com from 1969, 1996 and 2013, it was evident that rearing pond 24 was created between 1969 and 1996 (Appendix D).

4.7 Hatchery Pond 25

Hatchery Pond 25 is a pond immediately south of Wetland A and has been historically used to raise juvenile salmonids (Photograph 15). However, during the wetland and OHWM delineation site visit, the pond had been drained and only contained a small stream of water flowing through the center. The pond was devoid of vegetation and contained a silty mud bottom. Soils mapped within the area encompassing the pond are Yedlick stony ashy sandy loam, 30 to 45 percent slopes. Yedlick stony ashy sandy loam is considered to be non-hydric.

We believe hatchery pond 25 should be considered to be exempt from federal regulation due to the fact that it's a manmade pond that is excavated within non-hydric soils for the purposes of rearing juvenile salmonids (Figure 4). According to historic aerials that were examined from historicaerials.com from 1969, 1996 and 2013, it is evident that hatchery pond 25 was created between 1969 and 1996 (Appendix D).

4.8 Fish Ladder and Hatchery Pond

A fish ladder extends from the Klickitat River to the south and leads to an adult holding pond adjacent to rearing pond 24 (Photographs 16 through 18). During the site visit, the pond was full of water and the fish ladder contained flowing water. The pond and fish ladder were lined in cement and did not contain any vegetation.

We believe the fish ladder and hatchery pond should be considered to be exempt from federal regulation due to the fact that they are manmade features that are excavated within non-hydric soils for the purposes of capturing adult salmonids (Figure 4). According to historic aerials that were examined from historicaerials.com from 1969, 1996 and 2013, it is evident that the fish ladder and hatchery pond were created prior to 1969 (Appendix D).

4.9 Pollution Abatement Pond

The pollution abatement pond exists to the west of the adult holding pond and fish ladder (Photograph 19). During the site visit, the pond was full of water and contained algae floating on the surface. The pond is lined in cement and did not contain any vegetation.

We believe the pollution abatement pond should be considered to be exempt from federal regulation due to the fact that it is a manmade feature that was excavated within non-hydric soils for the purposes of capturing stormwater (Figure 4). According to historic aerials that were examined from historicaerials.com from 1969, 1996 and 2013, it is evident that the pollution abatement pond was created between 1969 and 1996 (Appendix D).

4.10 Adult Holding Pond (Adjacent to Pond 25)

An adult holding pond exists to the west of Pond 25, which has been used in the past to capture adult salmonids (Photograph 20). During the site visit, the pond was full of water. The pond was lined in cement and did not contain any vegetation.

We believe the adult holding pond should be considered to be exempt from federal regulation due to the fact that it is a manmade feature that was excavated within non-hydric soils for the purposes of capturing adult salmonids (Figure 4). According to historic aerials that were examined from historicaerials.com from 1969, 1996 and 2013, it is evident that the adult holding pond was created between 1996 and 2013 (Appendix D).

5.0 REGULATORY OVERVIEW

This section is an overview of regulatory requirements as they pertain to wetlands, streams, riparian areas, aquatic habitats, and priority habitats and species (PHS) within the study area.

5.1 Wetlands

The study area is located within Klickitat County's (County) jurisdiction. Therefore, the delineated wetland will be subject to the County's critical areas ordinance, Klickitat County Code (KCC) Chapter III – Wetlands. This ordinance designates, classifies, and provides measures to protect the functions and values of wetlands. The ordinance establishes protective buffers associated with wetlands and specifies that certain permits or approvals must be obtained for projects containing wetlands and/or their buffers. The County requires the use of Ecology's *Washington State Wetland Rating System for*

Eastern Washington to determine a wetland's category, which is based on its score for habitat, water quality, and hydrologic functions.

Using the wetland rating system (Hruby 2014), Wetland A was rated based on its functions. Wetland A received a Category IV rating having scored 15 points. Wetland B also received a Category IV rating and scored a total of 13 points. See Appendix C for the rating forms for Wetland A and B. Section 5.3 below provides a summary of the buffer requirements and includes Table 3, which summarizes wetland characteristics and buffer widths.

In addition to the County ordinance, jurisdictional wetlands are regulated at the federal and state levels by the USACE and Ecology under sections 404 and 401 of the Clean Water Act, respectively. Any impacts to the regulated wetlands within the study area will require notification of, and approval by, USACE and Ecology.

5.2 Habitat Conservation Areas

The study area is located within the County's jurisdiction, and is therefore subject to the County's habitat conservation ordinance (KCC) Chapter IV – Critical Fish/Wildlife Habitat Conservation Areas, which provides protective measures with the goal of no net loss of habitat functions and values within designated habitat areas. These habitat areas include the following:

- **Riparian Priority Habitat:** Areas extending outward on each side of the stream from the OHWM to the edge of the 100-year floodplain, or the following distances, if greater, according to the KCC Chapter 4.3.B.(1): Type S Water, 200 feet; Type F Water, 150 feet; Type Np water, 50 feet; and Type Ns water, 25 feet.
- **Other Priority Habitats and Species:** Areas identified by and consistent with Washington Department of Fish and Wildlife (WDFW) PHS criteria.
- **Locally Important Habitats and Species:** Areas legislatively designated and mapped by the County due to their unusual or unique habitat warranting protection because of qualitative species diversity or habitat system health indicators.

5.2.1 Priority Riparian Habitat

Priority riparian habitat is defined by WDFW as the area adjacent to flowing or standing freshwater aquatic ecosystems. It encompasses the area beginning at the OHWM and extends to that position on the terrestrial landscape that is influenced by, or that directly influences, the aquatic ecosystem.

WDNR indicates that the Klickitat River is designated as a Type F (fish-bearing) waterbody (WDNR 2017). Indian Ford A Spring is designated as a Type Np (non-fish bearing perennial) waterbody.

According to KCC Chapter 4.3(B), Type F waters require a buffer of 150 feet, measured horizontally from the OHWM. Type Np waters require a buffer of 50 feet.

5.2.2 Priority Habitat and Species

The presence of PHS within the study area was evaluated using the WDFW 2008 Priority Habitat and Species List (WDFW 2008), PHS online database (WDFW 2017), and KCC Chapter 4.3. Priority habitats are habitat types with unique or significant value to many species and may be described by a unique vegetation type or by a dominant plant species that is of primary importance to fish and wildlife (WDFW 2008). WDFW recommends that priority wildlife habitat information be used to inform conservation planning activities. Priority species are fish and wildlife species whose survival requires protective measures and/or management actions (WDFW 2008). It should be noted that PHS maps are created by interpreting aerial photographs and topographic maps coupled with limited field verifications, and are not meant to represent the extent of all PHS.

The priority habitats mapped within the study area include aquatic habitat and a biodiversity corridor. The Priority Habitat and Species (PHS) data (WDFW 2018) shows that areas in the vicinity of Wetland A provide habitat for the northern spotted owl and mule and black tailed deer. Within the Klickitat River, adjacent to the study area, there are bull trout, spring and fall Chinook, Coho, summer and winter steelhead, rainbow trout, and resident coastal cutthroat trout. In addition to the Priority Habitats discussed above, instream habitat, old growth/mature forests, and snags and logs were also identified as being present within the study area.

These priority habitats and species are briefly discussed below:

5.2.2.1 Aquatic Habitat

Freshwater wetland habitat includes land that is transitional between terrestrial and aquatic systems where the water table is typically at or near the surface or the land is covered by shallow water. Wetlands must have all of the following attributes: the land supports, at least periodically, predominantly undrained hydric soils; and/or the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. Palustrine wetland habitat is documented throughout the site.

5.2.2.2 Biodiversity Corridor

These areas have been identified as biologically diverse through a scientifically-based assessment conducted over a landscape or as an area within a city or urban growth area that contains habitat that is valuable to fish or wildlife and mostly comprises native vegetation. Biodiversity corridors are defined as areas of relatively undisturbed tracts of vegetation that connect fish and wildlife habitat conservation areas, priority habitats, and areas that are identified as biologically diverse or valuable habitat within a city or urban growth boundary. Although PHS on the web doesn't map the Klickitat River as a biodiversity corridor, we believe that a large portion of the riparian zone of the river is intact and provides an important corridor connecting fish and wildlife habitat conservation areas.

5.2.2.3 Instream Habitats

Instream habitats are those with a combination of physical, biological, and chemical processes and conditions that interact to provide functional life

history requirements for instream fish and wildlife resources. PHS on the web does not map the location of instream habitats, but the DNR Forest Practices Map indicates that the Klickitat River is a Type F and requires a 150-foot buffer according to the KCC. In addition, Indian Ford A Spring is a Type Np and requires a 50-foot buffer according to the KCC.

5.2.2.4 Old Growth/Mature Forests

Old growth forests that lie east of the Cascade Crest are stands that are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be greater than 150 years of age with 10 trees per acre that are greater than 21 inches diameter at breast height (dbh) and 1 to 3 snags per acre that are 12 to 14 inches in diameter.

Mature forests are stands that are between 80 to 200 years old with average diameters exceeding 21 inches dbh. The overall number of snags and quantity of large downed material is generally less than that found in old growth.

Although a formal tree survey has not been completed for the site, we believe that it's likely the area surrounding Indian Ford A Spring would qualify as an old growth or mature forest.

5.2.2.5 Snags and Logs

Snags and logs occur within a variety of habitat types that support trees. Priority snags have a diameter at breast height of greater than 12 inches in eastern Washington and are greater than 6.5 feet in height. Priority logs are greater than 12 inches in diameter at the largest end and greater than 20 feet long. Priority snag and log habitat includes individual snags and/or logs or groups of snags and/or logs of exceptional value to wildlife due to their scarcity or location in a particular landscape.

A formal survey for snags and logs was not completed for the site, but we believe there is a high likelihood that the snags and logs that surround Indian Ford A Spring met the criteria discussed above.

5.2.2.6 Priority Species

According to PHS mapped data on the web, there are nine types of priority species present throughout the study area, including: northern spotted owl, mule and black tailed deer, bull trout, spring and fall Chinook, Coho, summer and winter steelhead, rainbow trout, and resident coastal cutthroat trout. The PHS list indicates that a species mapped as a priority will fit one or more of the following criteria: (1) status as a state-listed or candidate species; (2) vulnerable aggregations including species or groups or animals susceptible to significant declines by virtue of the inclination to aggregate; and/or (3) species of recreational, commercial, and/or tribal importance.

The Klickitat River is known to support threatened bull trout (*Salvelinus confluentus*) and steelhead (*Oncorhynchus mykiss*). Other species present include: resident coastal cutthroat (*Oncorhynchus clarki*), Chinook

(*Oncorhynchus tshawytscha*), Coho (*Oncorhynchus kisutch*), and chum (*Oncorhynchus keta*) salmon.

5.3 Buffer Widths

BPA assessed Wetlands A and B using the Washington State Wetland Rating System for Eastern Washington (Hruby 2014). Table 3 shows the scores for each wetland function obtained from the rating system. The rating forms are included in Appendix C. Klickitat County specifies the widths of protective buffers for wetlands (KCC Chapter 3.3(A)). The buffers of wetlands and habitat conservation areas are discussed below.

BPA determined the OHWM of the Klickitat River and Indian Ford A Spring using the Washington Department of Ecology's guidance on *Determining the Ordinary High Water Mark on Streams on Washington State, March 2010*. See Appendix B for the ordinary high water mark field data forms. Stream types were determined using the Washington Department of Natural Resources forest practices application tool.

5.3.1 Wetland Buffers

KCC Chapter 3.3(A) specifies wetland buffer widths based on wetland category (Hruby 2014). All wetland buffers are to be measured horizontally outward from the delineated wetland boundary, or in the case of a stream with no adjacent wetlands, the OHWM as surveyed in the field. Wetland A and B both received a Category IV rating, which requires a 75-foot buffer. However, since Wetland B is less than 2,500 square feet in size, it is classified as being exempt according to KCC Chapter 3.2.

Table 3. Wetland Rating System for Eastern Washington Summary

Mapping ID	HGM Class	Water Quality Functions	Hydrologic Functions	Habitat Functions	Total Score	Category	Buffer Width
Wetland A	Depressional	4	3	8	15	IV	75 feet[1]
Wetland B	Depressional	3	3	7	13	IV	None[2]

[1] Buffer width according to KCC Chapter 4.3(B)(1).

[2] Wetland B is exempt from buffer requirements because it is below 2,500 square feet in size according to KCC Chapter 3.2.

5.3.2 Habitat Conservation Area Buffer

KCC Chapter 4.3(B) specifies buffer widths for habitat conservation areas, riparian areas, PHS and locally important habitats and species. According to KCC the habitat conservation area buffer extends horizontally from the OHWM. Based on KCC Chapter 4.3(B)(1), the Klickitat River requires a 150-foot buffer because it's a Type F water. Indian Ford A Spring requires a 50-foot buffer because it's a Type Np water.

Since the north portion of Indian Ford A Spring is located in Yakima County, it will be regulated under the Yakima County Code (YCC). According to the YCC 16A.04.22 Table 16A.04.24-2, Indian Ford A Spring is classified as a Type 3 stream. Type 3 streams include all perennial fish and non-fish bearing streams within Yakima County not classified as Type 1 or Type 2, which contribute significantly to the functional properties listed in Section 16A.04.02. According to Table 16A.04.24-2 within the YCC, Type 3 streams require a 75-foot buffer. The

delineated waterbodies, stream type and associated buffers is shown on Table 4 below.

Table 4. Delineated Waterbodies within the Study Area

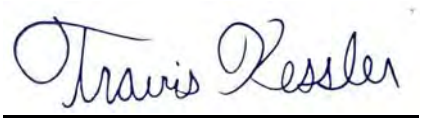
Mapping ID	Klickitat County Stream Type	Yakima County Stream Type	Buffer Width	
			Klickitat County	Yakima County
Klickitat River	F	N/A	150 feet[1]	N/A
Indian Ford A Spring	Np	3	50 feet[1]	75 feet[2]

[1]Buffer width according to KCC Chapter 4.3(B)(1).
[2]Buffer width according to YCC Table 16A,04.24-2.

6.0 CONCLUSION

This wetland report documents the investigation, best professional judgment and conclusions of BPA. It is correct and complete to the best of our knowledge. It should be considered a Preliminary Jurisdictional Determination of wetlands and other waters until it has been reviewed and approved in writing by the appropriate jurisdictional authorities. Classification of Wetlands A, B, Klickitat River, Indian Ford A Spring and the hatchery ponds with the associated outfall and fish ladder is provisional and subject to approval and concurrence by the U.S. Army Corps of Engineers.

Respectfully submitted,



Travis D. Kessler
Professional Wetland Scientist (Certification #2286)

7.0 REFERENCES

Brincken, E. 2009. Soil Survey of Klickitat County, Washington. United States Department of Agriculture. Natural Resource Conservation Service. Washington, DC.

Cowardin, L. M., C. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-78/31. US Department of the Interior, Fish and Wildlife Service, Office of Biological Services, Washington, D.C.

Ecology. 2017. Washington Department of Ecology, Washington State Water Resource Inventory Area (WRIA) Map. Available online at http://www.ecy.wa.gov/water/wria/39.html Accessed June 2018.

Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Technical Report Y-87-1. US Department of the Army, Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Google Earth Pro. 2017. 1994-2015 aerial photographs.

Hruby, T. 2014. *Washington State Wetland Rating System for Eastern Washington: 2014 Update*. (Publication #14-06-030). Olympia, WA: Washington Department of Ecology.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List*: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X

NRCS (Natural Resources Conservation Service). 2017a. Soil Survey Staff, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed June 2018.

NRCS. 2017b. United States Department of Agriculture. WETS data for Washington. Available online at http://efotg.sc.egov.usda.gov/efotg_locator.aspx. Accessed June 2018.

USACE (U.S. Army Corps of Engineers). 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). ERDC/EL TR-08-28. Vicksburg, MS. U.S. Army Corps of Engineer Research and Development Center.

USACE. 2016. National Wetland Plant List, version 3.3 http://wetland-plants.usace.army.mil/nwpl_static/index.html. U.S. Army Corps of Engineers, Engineer Research and Development Center Cold Regions Research and Engineering Laboratory, Hanover, NH.

USFWS (U.S. Fish and Wildlife Service). 2017. Publication date 1977 to present. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Available at http://www.fws.gov/wetlands/. Accessed June 2018.

USGS (U.S. Geological Survey). 2016. Science in Your Watershed website http://water.usgs.gov/wsc/index.html. Accessed October 2016.

USGS. 2015. National Hydrography Dataset (NHD). Accessed ArcGIS layer April 2018.

Washington Department of Natural Resources (WDNR). 2017. Forest Practices Application Mapping Tool. Accessed on 18 September 2017 at: https://fortress.wa.gov/dnr/protectiongis/fpamt/default.aspx

Washington State Department of Ecology (Ecology). 2010. Determining the Ordinary High Water Mark of Streams in Washington State. Second Draft. Publication 08-06-001.

Washington State Department of Ecology (Ecology). 2016. Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State. October 2016 Final Review. Publication No. 16-06-029. Available at: https://fortress.wa.gov/ecy/publications/documents/1606029.pdf

WDFW (Washington Department of Fish and Wildlife). 2018. Priority Habitat and Species (PHS) on the Web. Available online at http://apps.wdfw.wa.gov/phsontheweb/. Accessed June 2018.

Weather Underground. 2018. Glenwood, Washington. Precipitation data for February 2018 to May 2018. Available online at https://www.wunderground.com/weather/us/wa/glenwood. June 2018.

FIGURES

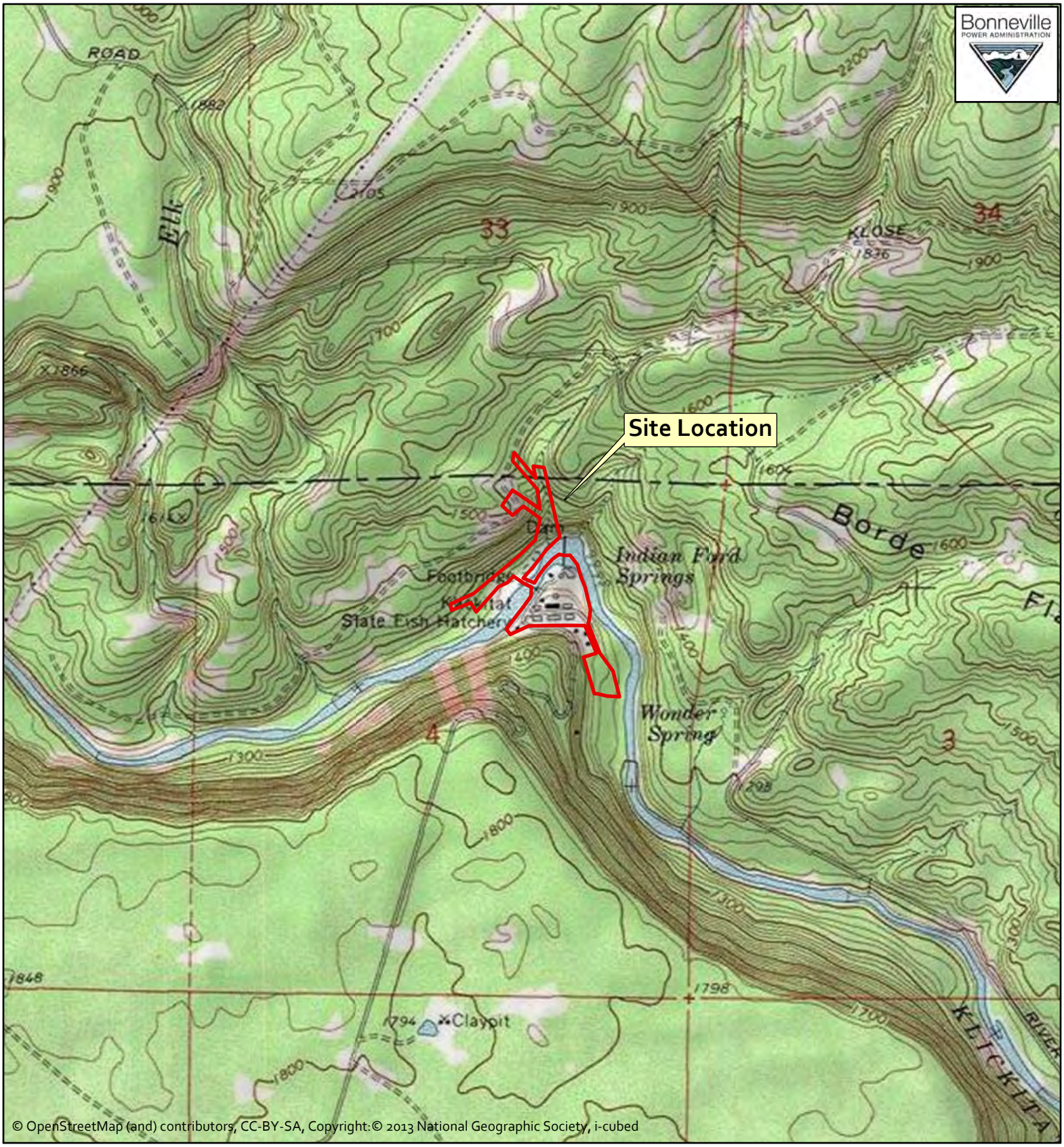


Figure 1. Site Location Map

Klickitat Hatchery Program
Klickitat and Yakima Counties, WA

N
W E
S

0 0.25 0.5 1 Mile

Map Date 10/10/2018 3:01 PM

GIS Analyst: RLW

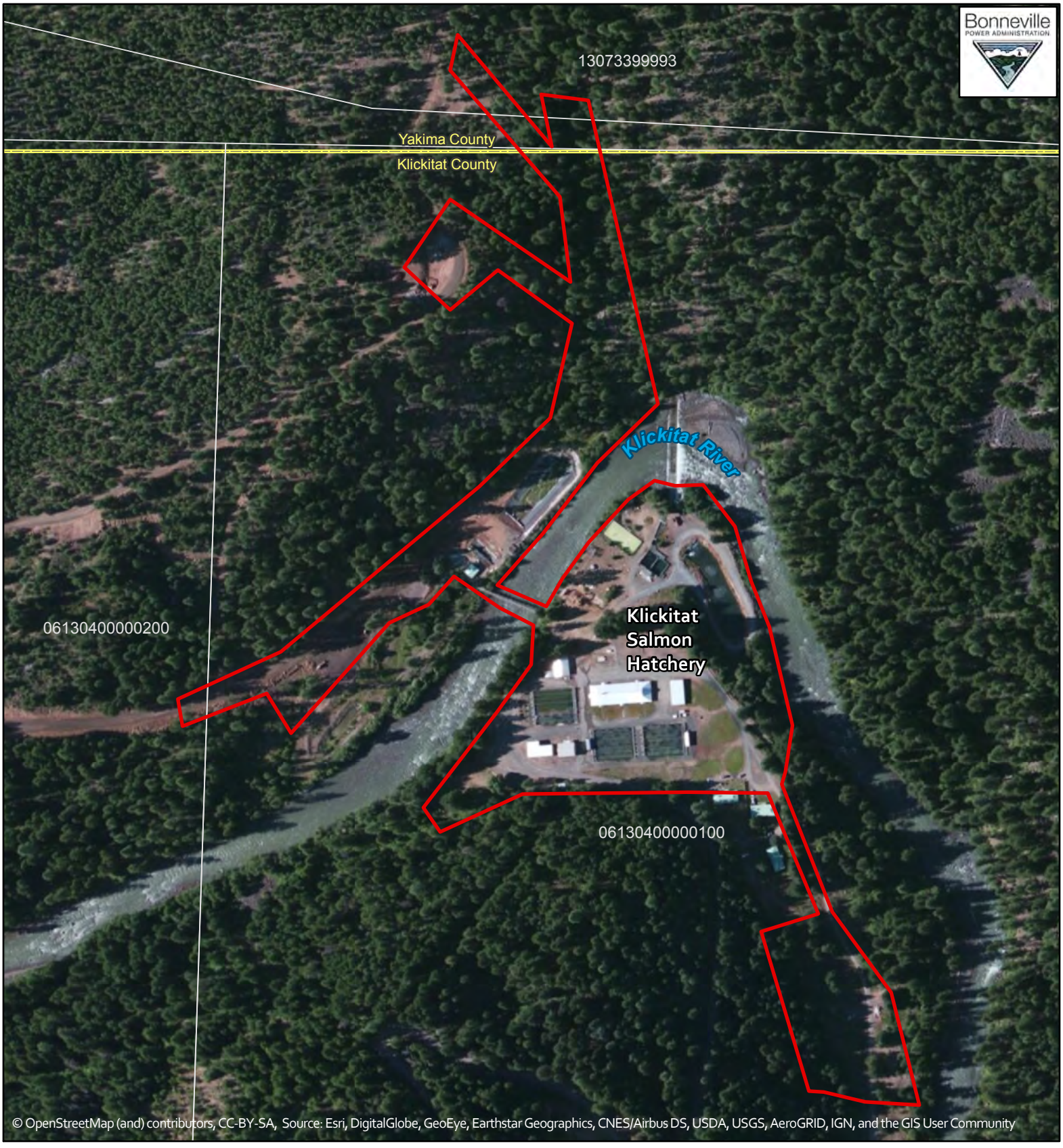


Figure 2. Study Area Map

Klickitat Hatchery Program
Klickitat and Yakima Counties, WA

Study Area
Parcels

N
W E
S

0 150 300 600
Feet

Map Date 10/10/2018 3:03 PM

GIS Analyst: RLW

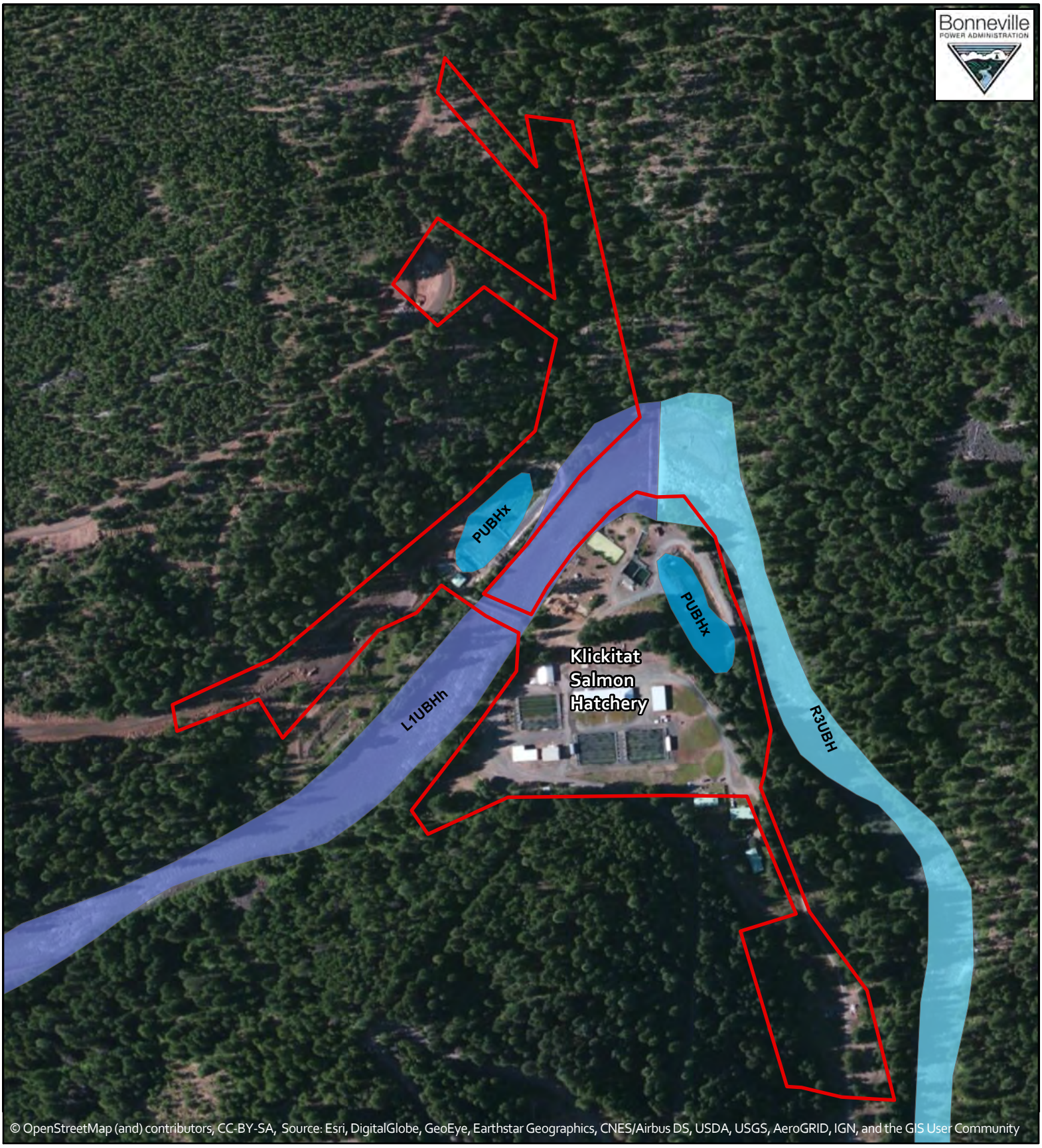


Figure 3. National Wetland Inventory Map

Klickitat Hatchery Program
Klickitat and Yakima Counties, WA

N
W E
S

L1UBHh = Lacustrine Limnetic Unconsolidated Bottom Permanently Flooded Diked/Impounded
PUBHx = Palustrine Unconsolidated Bottom Permanently Flooded Excavated
R3UBH = Riverine Upper Perennial Unconsolidated Bottom Permanently Flooded

0 150 300 600 Feet

Map Date 10/10/2018 2:40 PM

GIS Analyst: RLW

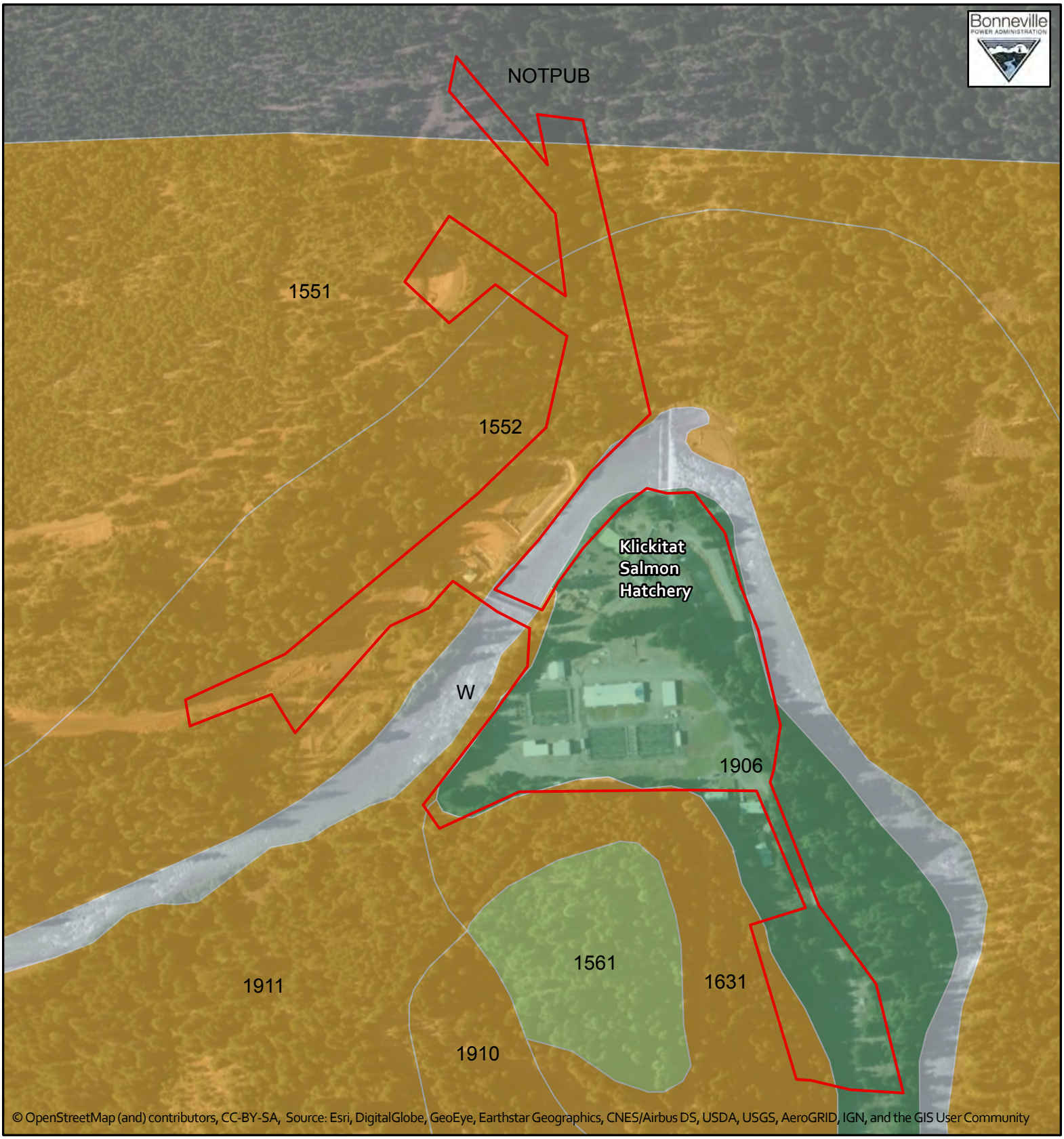


Figure 4. Soil Survey Map

Klickitat Hatchery Program Klickitat and Yakima Counties, WA

1551	Yedlick stony ashy sandy loam, 8 to 30 percent slopes
1552	Yedlick stony ashy sandy loam, 30 to 45 percent slopes
1561	Trelk ashy loam, 2 to 10 percent slopes
1631	Mazdale very stony ashy loam, 30 to 75 percent slopes
1906	Fluventic Haploxerolls-Riverwash complex, 0 to 5 percent slopes
1910	Mazdale-Rock outcrop-Rubble land complex, 50 to 90 percent slopes
1911	Rock outcrop-Rubble land-Mazdale complex, 50 to 90 percent slopes
NOTPUB	Not Public Information
W	Water

N
W E
S

0 150 300 600
Feet

Map Date 10/10/2018 2:59 PM

GIS Analyst: RLW

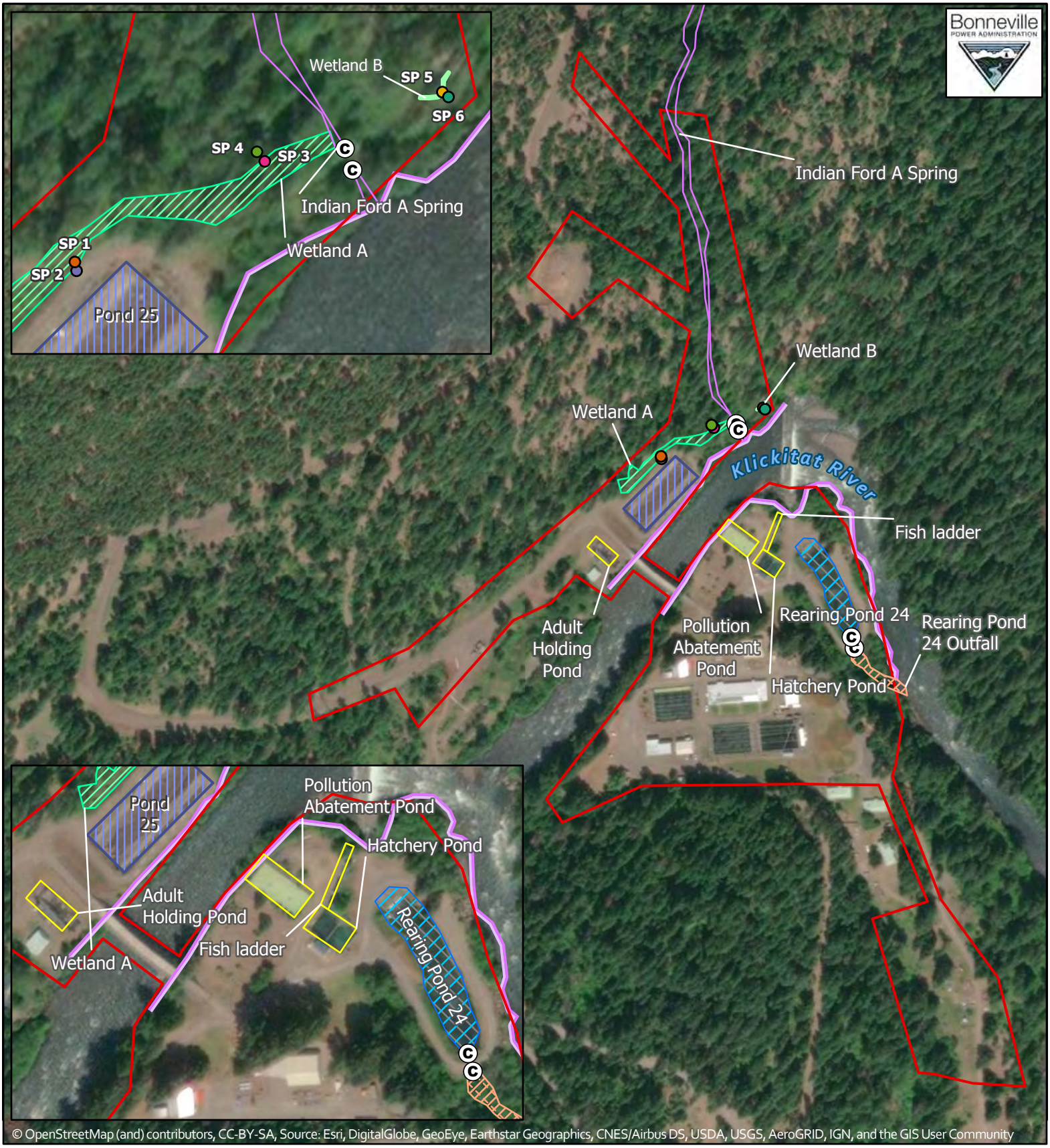


Figure 5. Wetland Delineation Map

Klickitat Hatchery Program
Klickitat and Yakima Counties, WA

- Study Area
- Constructed Basin
- Rearing Pond 24 Outfall
- Pond 25
- Rearing Pond 24
- Indian Ford A Spring
- Wetlands A and B
- Ordinary High Water
- Culvert
- SP 1
- SP 2
- SP 3
- SP 4
- SP 5
- SP 6

N W E S

0 100 200 400
Feet

Map Date 9/13/2019 10:44 AM

GIS Analyst: RLW

PHOTOGRAPHS

Photo 1. Looking southwest across Wetland A.

Photo 2. Looking southeast along Wetland A from gravel road.

Photo 3. Looking east across Wetland B.

Photo 4. Looking west across Wetland B.

Photo 5. Looking north across the south bank of the Klickitat River from the salmon hatchery.

Photo 6. Looking northeast at downstream section of Klickitat River from bridge.

Photo 7. Looking southeast downstream at Indian Ford A Spring intake.

Photo 8. Looking west across lower section of Indian Ford A Spring

Photo 9. View of culvert near at the base of Indian Ford A Spring that flows into the Klickitat River.

Photo 10. View of culvert where Indian Ford A Spring discharges into the Klickitat River.

Photo 11. Looking north at lower intake pipe that lies adjacent to Indian Ford A Spring.

Photo 12. Looking southeast along Rearing Pond 24 Outfall that flows out of Rearing Pond 24.

Photo 13. Looking northeast across Rearing Pond 24 Outfall.

Photo 14. Looking northwest across Rearing Pond 24.

Photo 15. Looking northeast across Pond 25 from bridge.

Photo 16. Looking southwest along fish ladder that flows out of the hatchery pond.

Photo 17. View of outlet to fish ladder where it flows into the Klickitat River.

Photo 18. Looking southeast across the hatchery pond.

Photo 19. Looking northwest across the pollution abatement pond.

Photo 20. Looking southwest across adult holding pond.

APPENDIX A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Klickitat Hatchery City/County: Glenwood/Klickitat Sampling Date: 5/31/18

Applicant/Owner: Yakama Nation Fisheries State: WA Sampling Point: 1

Investigator(s): Travis Kessler Section, Township, Range: Section 4, Township 6N, Range 13E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): B Lat: 46.04249 Long: 121.184 Datum: NAD 83

Soil Map Unit Name: Yedlick stony ashy sandy loam, 30 to 45 percent slopes (1552) NWI classification: None

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 _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: SP1 is located within Wetland A adjacent to an existing gravel road and is paired with SP2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20' radius)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	
Herb Stratum (Plot size: 10' radius)			
1. Schoenoplectus acutus	50	Yes	OBL
2. Scirpus microcarpus	20	Yes	OBL
3. Equisetum arvense	10	No	FAC
4. Juncus effusus	10	No	FACW
5. Epilobium ciliatum	10	No	FACW
6.			
7.			
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 5' radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 70	x 1 = 70
FACW species 20	x 2 = 40
FAC species 10	x 3 = 30
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 100 (A)	140 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ 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: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/2	100					sandy muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil 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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ 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)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 2

Water Table Present? Yes ☒ No ☐ Depth (inches): surface

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Klickitat Hatchery City/County: Glenwood/Klickitat Sampling Date: 5/31/18

Applicant/Owner: Yakama Nation Fisheries State: WA Sampling Point: 2

Investigator(s): Travis Kessler Section, Township, Range: Section 4, Township 6N, Range 13E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0

Subregion (LRR): B Lat: 46.04249 Long: 121.184 Datum: NAD 83

Soil Map Unit Name: Yedlick stony ashy sandy loam, 30 to 45 percent slopes (1552) NWI classification: None

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 _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: SP2 is located along the edge of an existing gravel road and abuts Wetland A and is paired with SP1.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: 20' radius)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 10' radius)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
Woody Vine Stratum (Plot size: 5' radius)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (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 = 0

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 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: Sample point is located in a gravel roadway.

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 3/3	100					silt loam	mixed with gravel and rock

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Rock and gravel

Depth (inches): 1

Hydric Soil Present? Yes ☐ No ☒

Remarks: Rock and gravel fill used for the gravel road were encountered at 1 inch.

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ 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)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Klickitat Hatchery City/County: Glenwood/Klickitat Sampling Date: 5/31/18

Applicant/Owner: Yakama Nation Fisheries State: WA Sampling Point: 3

Investigator(s): Travis Kessler Section, Township, Range: Section 4, Township 6N, Range 13E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): B Lat: 46.04249 Long: 121.184 Datum: NAD 83

Soil Map Unit Name: Yedlick stony ashy sandy loam, 30 to 45 percent slopes (1552) NWI classification: None

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 _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: SP3 is located within the east portion of Wetland A at the toe of a steep hillslope and is paired with SP4.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20' radius)			
1. Cornus alba	20	Yes	FACW
2. Rosa pisocarpa	10	Yes	FAC
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 10' radius)			
1. Schoenoplectus acutus	40	Yes	OBL
2. Eleocharis palustris	20	Yes	OBL
3. Epipactis gigantea	20	Yes	OBL
4. Cicuta douglasii	5	No	OBL
5. Iris missouriensis	5	No	FACW
6. Equisetum arvense	5	No	FAC
7. Juncus effusus	5	No	FACW
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 5' radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 85	x 1 = 85
FACW species 30	x 2 = 60
FAC species 15	x 3 = 45
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 130 (A)	190 (B)

Prevalence Index = B/A = 1.5

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ 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: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					sandy muck	mixed with wood chunks
16+							wood	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Wood chunks

Depth (inches): 16

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks: Wood chunks were located at 16 inches in the soil profile.

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ 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)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) (**Riverine**)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☒ No ☐ Depth (inches): 1

Water Table Present? Yes ☒ No ☐ Depth (inches): surface

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): surface

Wetland Hydrology Present? **Yes** ☒ **No** ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Klickitat Hatchery City/County: Glenwood/Klickitat Sampling Date: 5/31/18

Applicant/Owner: Yakama Nation Fisheries State: WA Sampling Point: 4

Investigator(s): Travis Kessler Section, Township, Range: Section 4, Township 6N, Range 13E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 10

Subregion (LRR): B Lat: 46.04249 Long: 121.184 Datum: NAD 83

Soil Map Unit Name: Yedlick stony ashy sandy loam, 30 to 45 percent slopes (1552) NWI classification: None

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 _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: SP4 is located adjacent to Wetland A at the base of a steep hillslope and is paired with SP3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pseudotsuga menziesii	30	Yes	FACU
2. Pinus ponderosa	20	Yes	FACU
3. Thuja plicata	10	No	FAC
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20' radius)			
1. Acer circinatum	10	Yes	FAC
2. Symphoricarpos albus	10	Yes	FACU
3. Quercus garryana	10	Yes	UPL
4. Pinus ponderosa	10	Yes	FACU
5. Amelanchier alnifolia	10	Yes	FACU
	50	= Total Cover	
Herb Stratum (Plot size: 10' radius)			
1. Schedonorus arundinaceus	20	Yes	FACU
2. Pteridium aquilinum	10	No	FACU
3. Equisetum arvense	10	No	FAC
4.			
5.			
6.			
7.			
8.			
	40	= Total Cover	
Woody Vine Stratum (Plot size: 5' radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 40 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 13 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species 30	x 3 = 90
FACU species 110	x 4 = 440
UPL species 10	x 5 = 50
Column Totals: 150 (A)	580 (B)

Prevalence Index = B/A = 3.9

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 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: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					silt loam	
8-16	10YR 3/3	100					silt loam	
16+							rock	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 16

Hydric Soil Present? Yes ☐ No ☒

Remarks: Rock cobbles were encountered at 16 inches in the soil profile.

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ 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)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Klickitat Hatchery City/County: Glenwood/Klickitat Sampling Date: 5/1/19

Applicant/Owner: Yakama Nation Fisheries State: WA Sampling Point: 5

Investigator(s): Travis Kessler Section, Township, Range: Section 4, Township 6N, Range 13E

Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): B Lat: 46.04249 Long: 121.184 Datum: NAD 83

Soil Map Unit Name: Yedlick stony ashy sandy loam, 30 to 45 percent slopes (1552) NWI classification: None

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 _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☒ No ☐ Hydric Soil Present? Yes ☒ No ☐ Wetland Hydrology Present? Yes ☒ No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐

Remarks: SP5 is located within Wetland B adjacent to an existing gravel road and is paired with SP6.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	80	Yes	FAC
2.			
3.			
4.			
	80	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20' radius)			
1. Rosa nutkana	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 10' radius)			
1. Equisetum arvense	10	Yes	FAC
2. Carex obnupta	10	Yes	OBL
3. Rubus ursinus	10	Yes	FAC
4. Juncus effusus	10	Yes	FACW
5. Poa pratensis	10	Yes	FAC
6.			
7.			
8.			
	50	= Total Cover	
Woody Vine Stratum (Plot size: 5' radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 10	x 1 = 10
FACW species 10	x 2 = 20
FAC species 125	x 3 = 375
FACU species	x 4 =
UPL species	x 5 =
Column Totals: 145 (A)	405 (B)

Prevalence Index = B/A = 2.79

Hydrophytic Vegetation Indicators:

☒ Dominance Test is >50%

☒ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ 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: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 3/1	100					sandy muck	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil 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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ 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)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☒ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 8

Saturation Present? (includes capillary fringe) Yes ☒ No ☐ Depth (inches): 2

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Klickitat Hatchery City/County: Glenwood/Klickitat Sampling Date: 5/1/19

Applicant/Owner: Yakama Nation Fisheries State: WA Sampling Point: 6

Investigator(s): Travis Kessler Section, Township, Range: Section 4, Township 6N, Range 13E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): B Lat: 46.04249 Long: 121.184 Datum: NAD 83

Soil Map Unit Name: Yedlick stony ashy sandy loam, 30 to 45 percent slopes (1552) NWI classification: None

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 _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ☐ No ☒ Hydric Soil Present? Yes ☐ No ☒ Wetland Hydrology Present? Yes ☐ No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒

Remarks: SP6 is located on the edge of an old gravel road adjacent to Wetland B and is paired with SP5.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	40	Yes	FAC
2.			
3.			
4.			
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size: 20' radius)			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	
Herb Stratum (Plot size: 10' radius)			
1. Festuca arundinacea	50	Yes	FAC
2. Taraxacum officinale	10	Yes	FACU
3. Trifolium pratense	10	Yes	FACU
4. Plantago major	10	Yes	FAC
5. Plantago lanceolata	10	Yes	FAC
6. Rubus ursinus	5	No	FAC
7. Equisetum arvense	5	No	FAC
8.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 5' radius)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 110	x 3 = 330
FACU species 20	x 4 = 80
UPL species _____	x 5 = _____
Column Totals: 130 (A)	410 (B)

Prevalence Index = B/A = 3.15

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ 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: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100					sandy loam	
12+							rock cobble	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock cobble

Depth (inches): 12

Hydric Soil Present? Yes ☐ No ☒

Remarks: Rock cobble was encountered at 12 inches in the soil profile.

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) (**Non riverine**)
- ☐ Sediment Deposits (B2) (**Non riverine**)
- ☐ Drift Deposits (B3) (**Non riverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ 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)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) **(Riverine)**
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

APPENDIX B

Ordinary High Water Mark Field Data Forms

Appendix ~~A~~ B: Field data form

General Information

Site/Project Name/Owner: Klickitat Hatchery Travis Kessler
Location: Glenwood, WA
Description: Unnamed Tributary to the Klickitat River

The following field form is for use in the field to help in making ordinary high water mark delineations on streams. The form should be used as a guide. A team consisting of a hydrologist/ geomorphologist and a biologist may be needed to accurately determine the ordinary high water mark.

General Observations: Day of Site Visit

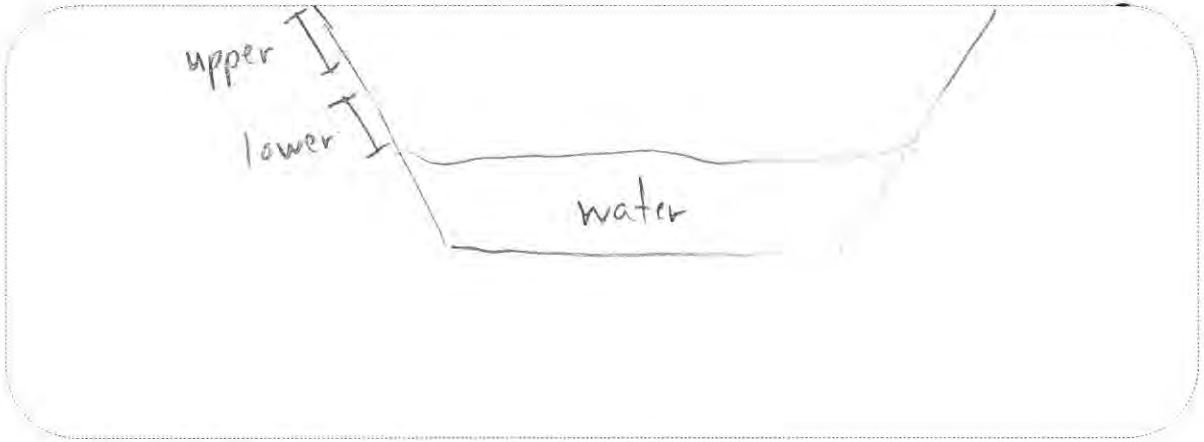
Date of site visit:	5/31/18			
Time of site visit:	10am			
Weather conditions:	Sunny, 75°F			
Watershed development:	Highly developed ○		Mod. Developed ○	Undeveloped ⊘
Reach development:	Highly developed ○		Mod. Developed ○	Undeveloped ⊘
Recent site disturbance?	No ⊘	Yes ○	Describe:	
Upstream flow control devices?	No ⊘	Yes ○	Describe:	
Bank armoring at the site?	No ⊘	Yes ○	Describe:	
Bank armoring up or downstream?	No ⊘	Yes ○	Describe:	
Observable tidal backwater?	No ⊘	Yes ○		
In-water structures? (i.e. bridge pilings, railroad embankments)	No ⊘	Yes ○	Describe:	
Animals grazing in riparian zone?	No ⊘	Yes ○	Describe:	
Observable beaver activity?	No ⊘	Yes ○	Describe:	

Complete Vegetation Transects

- Use guidelines in Chapter 4 to complete vegetation transects.
- Determine upper and lower bounds of the OHWM from vegetation transects.
- After completing vegetation transects, look for more field indicators near the upper and lower bounds of the OHWM. Use the checklist as guidance.

Sketch

If a simple site, sketch a cross-sectional diagram of the site below. Include location of the waterway and upper and lower bounds of the OHWM defined by the vegetation communities or other OHWM indicators. Page 3 of the data form can be used for more complex sketches



Additional Indicators

Check the indicators that are observable at the site that provide rationale for establishing the OHWM at this location. The rationale should be described in detail in the report and should be supported with photographs taken during the site visit.

	Soil and geomorphic indicators [24]	Vegetative indicators [25]	Other indicators
Below OHWM	o Sediment bars ø Scour line ø Clean cobbles/boulders. ø Bank erosion/scour o Lack of soil horizons	Vegetation tolerant of inundation or high flow disturbances such as: o Willows o Black cottonwood o Japanese knotweed o Skunk cabbage o Aquatic plants	ø Exposed roots/root scour ø Drainage patterns, as shown by flattened vegetation o Aquatic animals o Algal mats o Iron staining

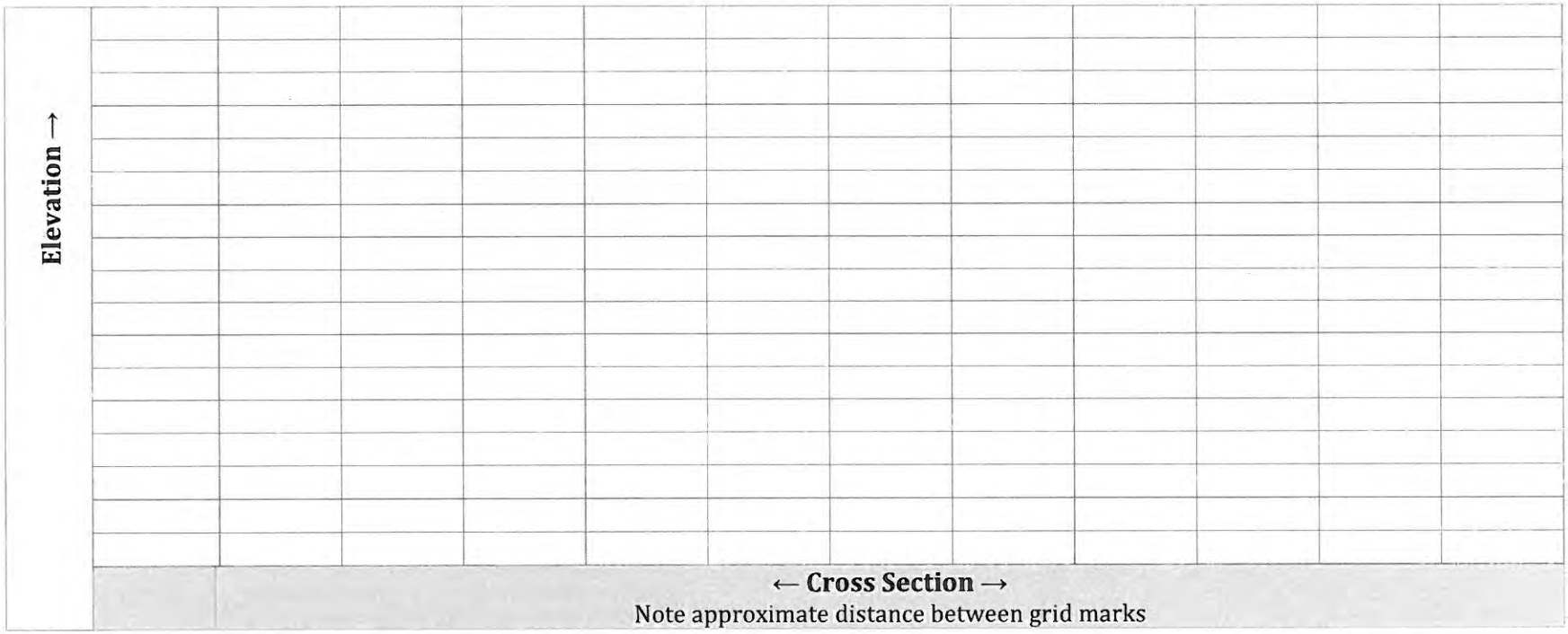
[24] Refer to Chapter 4 for a more complete description of indicators.

[25] Species are provided as examples. Refer to Appendix B for a more complete listing of plant species and their distribution across the OHWM gradient. Some species occur in more than one category depending on site conditions. For example Indian plum and red alder may straddle the OHWM where soil drainage is high. They may occur above OHWM were soil drainage is low to moderate.

	Soil and geomorphic indicators [24]	Vegetative indicators [25]	Other indicators
At or straddling OHWM	o Top of bank o Toe of lowest terrace (if terrace has developed horizons which may include a duff layer and A and B horizons versus freshly deposited alluvium) o Benches	o Willows o Western red cedar X Vine maple (streams) o Black cottonwood X Red alder o Salmonberry o Nootka rose X Maidenhair and lady fern o Blackberries o Dunegrasses	o Sediment lines on vegetation or other fixed objects o Change from channel deposits to older alluvium. o Darker stain lines on fixed objects X Exposed roots/root scour. X Drainage patterns, as evidenced by flattened vegetation X Weathered and buried driftwood
Above OHWM	o Hillslope toe X Terraces or alluvium with an organic horizon or other developed soil horizons o Relic floodplain surface o Well developed soil A andB horizons/duff layer	o Indian plum o Red alder X Western red cedar X Douglas fir o Western hemlock X Ponderosa pine X Oregon white oak o Coast pine o Quaking aspen o Vine maple (lakes) o Blackberries	X Lighter or no staining on fixed objects o Overbank deposits

Notes

The OHWM is located along a high gradient stream with steep banks on the east and west sides. The vegetation is dense below the OHWM and consists of mostly vine maple, northern lady fern, and mosses. Above the OHWM is a mixture of Ponderosa pine, Douglas fir, western red cedar, beaked hazelnut, common snowberry, and narrow-leaf fireweed.



Plant Distribution Across OHWM Gradient		
Below ~~Above~~ OHWM	At/Straddling OHWM	Above OHWM
Acer circinatum	Acer circinatum	Pinus ponderosa
Athyrium angustum	Corylus cornuta	Thuja plicata
Equisetum arvense		Pseudotsuga menziesii
Mosses		Corylus cornuta
		Acer circinatum
		Chamaenerion angustifolium

Appendix B: Field data form

General Information

Site/Project Name/Owner: Klickitat Hatchery / Travis Kessler
Location: Glenwood, WA
Description: Klickitat River surrounding salmon hatchery

The following field form is for use in the field to help in making ordinary high water mark delineations on streams. The form should be used as a guide. A team consisting of a hydrologist/ geomorphologist and a biologist may be needed to accurately determine the ordinary high water mark.

General Observations: Day of Site Visit

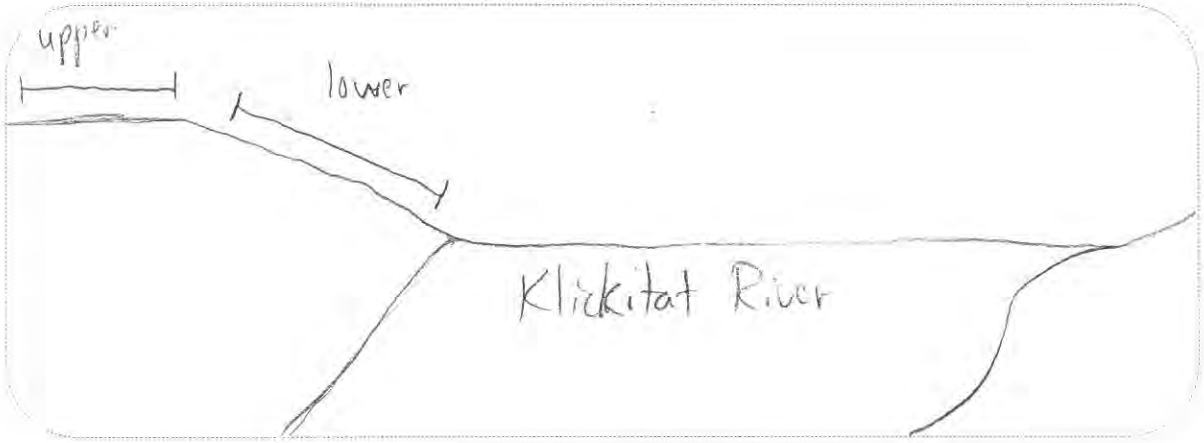
Date of site visit:	5/31/18			
Time of site visit:	10am			
Weather conditions:	Sunny, 75°F			
Watershed development:	Highly developed ○		Mod. Developed ○	Undeveloped ⊘
Reach development:	Highly developed ○		Mod. Developed ⊘	Undeveloped ○
Recent site disturbance?	No ⊘	Yes ○	Describe:	
Upstream flow control devices?	No ⊘	Yes ○	Describe:	
Bank armoring at the site?	No ○	Yes ⊘	Describe: riprap	
Bank armoring up or downstream?	No ○	Yes ⊘	Describe: riprap	
Observable tidal backwater?	No ⊘	Yes ○		
In-water structures? (i.e. bridge pilings, railroad embankments)	No ○	Yes ⊘	Describe: bridge abutments	
Animals grazing in riparian zone?	No ⊘	Yes ○	Describe:	
Observable beaver activity?	No ⊘	Yes ○	Describe:	

Complete Vegetation Transects

- Use guidelines in Chapter 4 to complete vegetation transects.
- Determine upper and lower bounds of the OHWM from vegetation transects.
- After completing vegetation transects, look for more field indicators near the upper and lower bounds of the OHWM. Use the checklist as guidance.

Sketch

If a simple site, sketch a cross-sectional diagram of the site below. Include location of the waterway and upper and lower bounds of the OHWM defined by the vegetation communities or other OHWM indicators. Page 3 of the data form can be used for more complex sketches



Additional Indicators

Check the indicators that are observable at the site that provide rationale for establishing the OHWM at this location. The rationale should be described in detail in the report and should be supported with photographs taken during the site visit.

	Soil and geomorphic indicators [24]	Vegetative indicators [25]	Other indicators
Below OHWM	☒ Sediment bars ☒ Scour line ☒ Clean cobbles/boulders. ☒ Bank erosion/scour o Lack of soil horizons	Vegetation tolerant of inundation or high flow disturbances such as: ☒ Willows o Black cottonwood o Japanese knotweed o Skunk cabbage o Aquatic plants	☒ Exposed roots/root scour ☒ Drainage patterns, as shown by flattened vegetation o Aquatic animals o Algal mats ☒ Iron staining

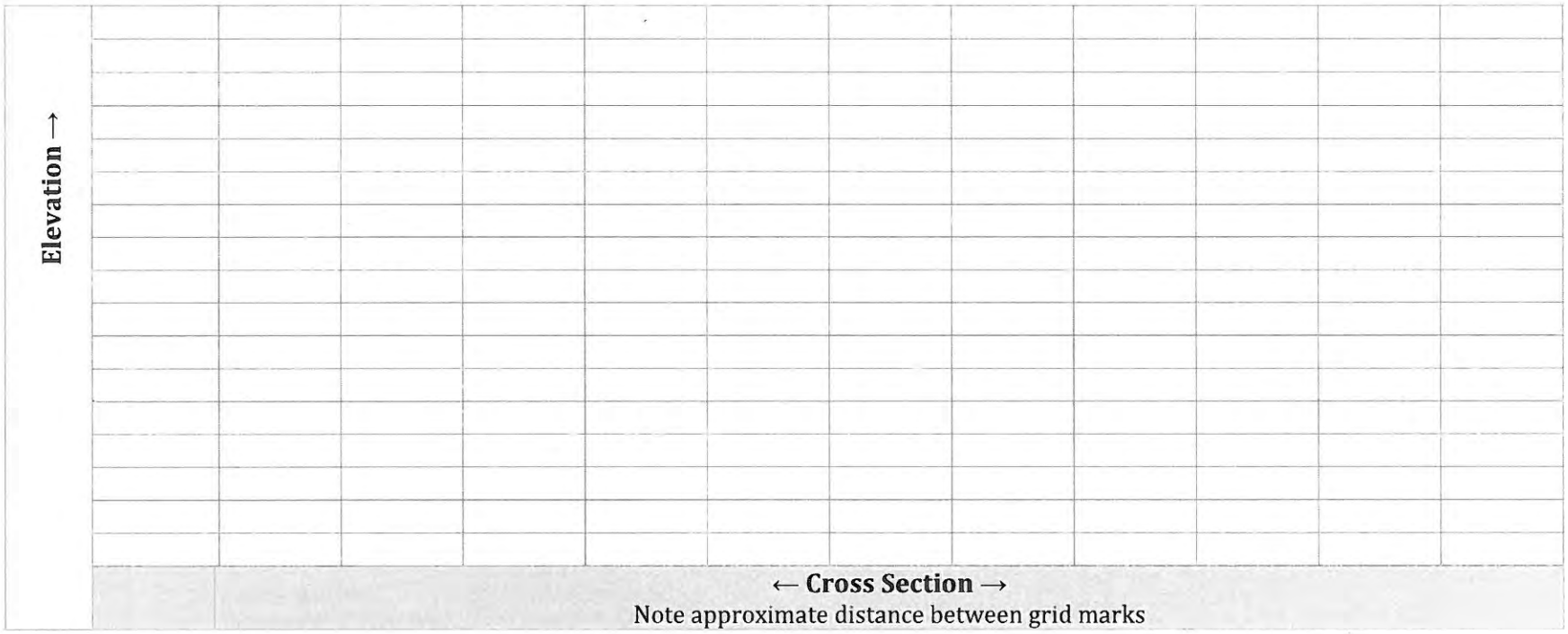
[24] Refer to Chapter 4 for a more complete description of indicators.

[25] Species are provided as examples. Refer to Appendix B for a more complete listing of plant species and their distribution across the OHWM gradient. Some species occur in more than one category depending on site conditions. For example Indian plum and red alder may straddle the OHWM where soil drainage is high. They may occur above OHWM were soil drainage is low to moderate.

	Soil and geomorphic indicators [24]	Vegetative indicators [25]	Other indicators
At or straddling OHWM	☒ Top of bank ○ Toe of lowest terrace (if terrace has developed horizons which may include a duff layer and A and B horizons versus freshly deposited alluvium) ☒ Benches	☒ Willows ○ Western red cedar ○ Vine maple (streams) ○ Black cottonwood ☒ Red alder ○ Salmonberry ○ Nootka rose ○ Maidenhair and lady fern ○ Blackberries ○ Dunegrasses	☒ Sediment lines on vegetation or other fixed objects ○ Change from channel deposits to older alluvium. ☒ Darker stain lines on fixed objects ☒ Exposed roots/root scour. ☒ Drainage patterns, as evidenced by flattened vegetation ☒ Weathered and buried driftwood
Above OHWM	☒ Hillslope toe ○ Terraces or alluvium with an organic horizon or other developed soil horizons ☒ Relic floodplain surface ○ Well developed soil A andB horizons/duff layer	○ Indian plum ○ Red alder ○ Western red cedar ○ Douglas fir ○ Western hemlock ☒ Ponderosa pine ○ Oregon white oak ○ Coast pine ○ Quaking aspen ○ Vine maple (lakes) ○ Blackberries	○ Lighter or no staining on fixed objects ☒ Overbank deposits

Notes

The OHWM is located along an existing riprap berm of the Klickitat River adjacent to the salmon hatchery. The vegetation is patchy but generally contains red alder and willows along the shoreline and more ponderosa pine mixing in towards the top of the berm.



Plant Distribution Across OHWM Gradient

Below ~~Above~~ OHWM	At/Straddling OHWM	Above OHWM
Salix sp.	Salix sp.	Pinus ponderosa
Alnus rubra	Alnus rubra	Lonicera tartarica
Cornus alba	Cornus alba	Equisetum arvense
Poa pratensis		Schedonorus arundinaceus

APPENDIX C

Wetland Rating Forms for Eastern Washington

Wetland name or number A

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland A Date of site visit: 5/31/18

Rated by Travis Kessler Trained by Ecology? X Yes ___ No Date of training 10/2006

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y X N

NOTE: Form is not complete without the figures requested (*figures can be combined*).

Source of base aerial photo/map BPA eGIS

OVERALL WETLAND CATEGORY ___I___ (based on functions___ or special characteristics___)

1. Category of wetland based on FUNCTIONS

___X___ **Category I** – Total score = 22-27

_____ **Category II** – Total score = 19-21

_____ **Category III** – Total score = 16-18

_____ **Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H M (L)	H (M) L	
Landscape Potential	H M (L)	H M (L)	(H) M L	
Value	H M (L)	H M (L)	(H) M L	TOTAL
Score Based on Ratings	9	4	15	28

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	X

Wetland name or number A

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	2
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	3
Map of the contributing basin	D 5.3	4
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	5
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	6
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	7

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number A

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

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 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   (NO) – go to 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**.

   (NO) - go to 3 YES – The wetland class is **Slope**
   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 <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   √ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   √ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 (YES) – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 (YES) – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND 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 the wetland unit being scored.

Wetland name or number A

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 HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: 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, unconstricted, surface outlet points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) 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	5
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	1
Total for D 1 Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12- 16 = H** 9 **6- 11 = M** ___ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** 0 **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** 0 **0 = L** *Record the rating on the first page*

Wetland name or number A

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: 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 unconstricted surface outlet — points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 6 The wetland is a headwater wetland — points = 4 Seasonal ponding: 1 ft - < 2 ft — points = 4 Seasonal ponding: 6 in - < 1 ft — points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils — points = 0	0
Total for D 4 — Add the points in the boxes above	4

Rating of Site Potential If score is: ___**12-16 = H** ___**6-11 = M** 4 **0-5 = L** *Record the rating on the first page*

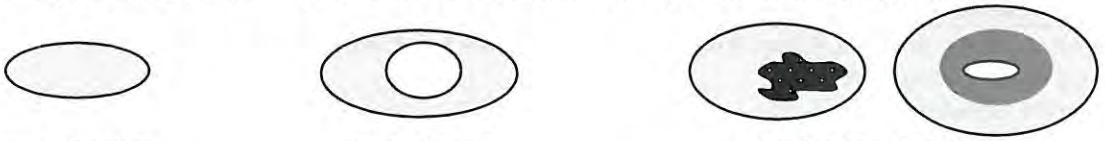
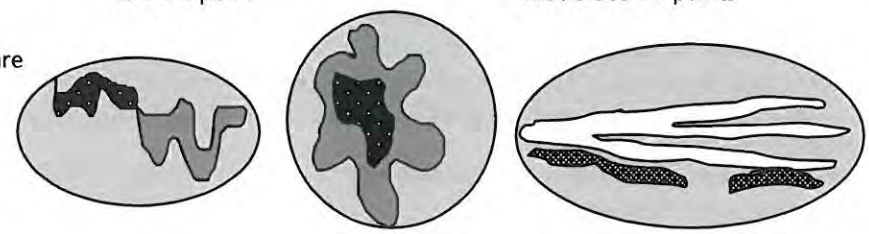
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 No = 0	0
Total for D 5 — Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___**3 = H** ___**1 or 2 = M** 0 **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland — points = 2 Surface flooding problems are in a sub-basin farther down-gradient — points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 — Add the points in the boxes above	0

Rating of Value If score is: ___**2-4 = H** ___**1 = M** 0 **0 = L** *Record the rating on the first page*

Wetland name or number A

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ___Aquatic bed X Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover X Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover X Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover X Scrub-shrub (areas where shrubs have >30% cover) ___Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	3
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***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 wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species 11 Scoring: > 9 species: points = (2) 4-9 species: points = 1 < 4 species: points = 0	2
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure 1 2

Wetland name or number A

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* X Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. X Cattails or bulrushes are present within the wetland. ___ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ___ Emergent or shrub vegetation in areas that are permanently inundated/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 X Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	3
Total for H 1 — Add the points in the boxes above	7

Rating of Site Potential If score is: ___ **15-18 = H** 7 **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat _____ + [(% moderate and low intensity land uses)/2] ____ =_____% > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	3
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat _____ + [(% moderate and low intensity land uses)/2] ____ =_____% Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	3
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 — Add the points in the boxes above	6

Rating of Landscape Potential If score is: 6 **4-9 = H** ___ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 X It has 3 or more priority habitats within 100 m (see Appendix B) X It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) X It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: 2 **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland 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 wetlands 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 Is the wetland **less than 4000 ft²**, 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. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.* — The soil in the wetland is shallow [< 1 ft (30 cm)deep] 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 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 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 meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — 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. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** (No) – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** (No) = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 3.4** (No) = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** (No) =**Not a WHCV**	**Cat. I**

Wetland name or number A

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils.* Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in 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 an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 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 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2**	**Cat. I**
SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3**	**Cat. I**
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4**	**Cat. II**
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**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 Summary Form	

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

X **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*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

X **Oregon White Oak:** Woodland 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 – see web link above*).

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

X **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 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

X **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 > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **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).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number B

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland B Date of site visit: 5/1/19

Rated by Travis Kessler Trained by Ecology? X Yes ___ No Date of training 10/2006

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___Y X N

NOTE: Form is not complete without the figures requested (*figures can be combined*).

Source of base aerial photo/map BPA eGIS

OVERALL WETLAND CATEGORY IV (based on functions___ or special characteristics___)

1. Category of wetland based on FUNCTIONS

___**Category I** – Total score = 22-27

___**Category II** – Total score = 19-21

___**Category III** – Total score = 16-18

X **Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	H M (L)	H M (L)	
Landscape Potential	H M (L)	H M (L)	(H) M L	
Value	H M (L)	H M (L)	(H) M L	TOTAL
Score Based on Ratings	3	3	7	13

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	X

Wetland name or number B

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	2
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	3
Map of the contributing basin	D 5.3	4
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	5
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	6
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	7

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number B

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

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 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   (NO) – go to 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**.

   NO - go to 3 YES – The wetland class is **Slope**
   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 <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   X The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   X The overbank flooding occurs at least once every 10 years.

   NO - go to 4 (YES) – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 (YES) – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. 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 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND 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 the wetland unit being scored.

Wetland name or number B

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 HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number B

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: 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, unconstricted, surface outlet — points = 1	1
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) 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	3
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	0
Total for D 1 — Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12- 16 = H** ___ **6- 11 = M** 4 **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 — Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ___ **1 or 2 = M** 0 **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	0
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	0
Total for D 3 — Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** 0 **0 = L** *Record the rating on the first page*

Wetland name or number B

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: 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 unconstricted surface outlet — points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 6 The wetland is a headwater wetland — points = 4 Seasonal ponding: 1 ft - < 2 ft — points = 4 Seasonal ponding: 6 in - < 1 ft — points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils — points = 0	0
Total for D 4 — Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12-16 = H** ___ **6-11 = M** 4 **0-5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	0
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 No = 0	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 No = 0	0
Total for D 5 — Add the points in the boxes above	0

Rating of Landscape Potential If score is: ___ **3 = H** ___ **1 or 2 = M** 0 **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland — points = 2 Surface flooding problems are in a sub-basin farther down-gradient — points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for D 6 — Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** 0 **0 = L** *Record the rating on the first page*

Wetland name or number_____

RIVERINE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland 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 Depressions present but cover < $^1/_{10}$ area of wetland points = 1 No depressions present points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height; **not** Cowardin 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	
Total for R 1 Add the points in the boxes above	

Rating of Site Potential If score is:___**12-16 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	
R 2.2. Does the contributing basin include a UGA or incorporated area? Yes = 1 No = 0	
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	
R 2.4. Is > 10% of the area within 150 ft of wetland in land uses that generate pollutants Yes = 1 No = 0	
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4? Source_____ Yes = 1 No = 0	
Total for R 2 Add the points in the boxes above	

Rating of Landscape Potential If score is:___**3-6 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	
R 3.2. Does the river or stream have TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the drainage in which wetland is found.* Yes = 2 No = 0	
Total for R 3 Add the points in the boxes above	

Rating of Value If score is:___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number_____

RIVERINE WETLANDS **Hydrologic Functions** - Indicators that site functions to reduce flooding and stream erosion	Points (only 1 score per box)
R 4.0. Does the site have the potential to reduce flooding and erosion?	
R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 2 — points = 10 If the ratio is 1-2 — points = 8 If the ratio is ½-<1 — points = 4 If the ratio is ¼-< ½ — points = 2 If the ratio is < ¼ — points = 1	
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have > 90% cover at person height. These are NOT Cowardin classes).* Forest or shrub for more than $^2/_3$ the area of the wetland — points = 6 Forest or shrub for > $^1/_3$ area OR emergent plants > $^2/_3$ area — points = 4 Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area — points = 2 Plants do not meet above criteria — points = 0	
Total for R 5 — Add the points in the boxes above	

Rating of Site Potential If score is:___**12-16 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

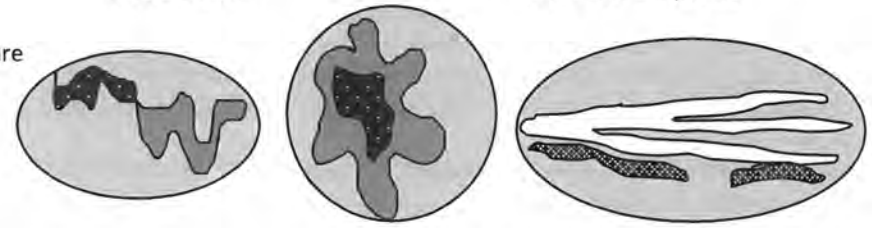
R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
R 5.1. Is the stream or river adjacent to the wetland downcut? — Yes = 0 No = 1	
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? — Yes = 1 No = 0	
R 5.3. Is the up-gradient stream or river controlled by dams? — Yes = 0 No = 1	
Total for R 5 — Add the points in the boxes above	

Rating of Landscape Potential If score is:___**3 = H** ___**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

R 6.0. Are the hydrologic functions provided by the site valuable to society?	
R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site.* The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources — points = 2 Surface flooding problems are in a basin farther down-gradient — points = 1 No flooding problems anywhere downstream — points = 0	
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? — Yes = 2 No = 0	
Total for R 6 — Add the points in the boxes above	

Rating of Value If score is:___**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number B

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed __X__Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ____Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ____Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover __X__Scrub-shrub (areas where shrubs have >30% cover) ____Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***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 wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* Yes = 3 No = 0	0
H 1.4. Richness of plant species 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 Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species ____ Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure 1 1

Wetland name or number B

H 1.6. Special habitat features	
Check the habitat features that are present in the wetland. The number of checks is the number of points. X Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ___ Cattails or bulrushes are present within the wetland. ___ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ___ Emergent or shrub vegetation in areas that are permanently inundated/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 X Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	2
Total for H 1 — Add the points in the boxes above	5

Rating of Site Potential If score is: ___ **15-18 = H** ___ **7-14 = M** 5 **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat _____ + [(% moderate and low intensity land uses)/2] ____ =_____% > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	3
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat _____ + [(% moderate and low intensity land uses)/2] ____ =_____% Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	2
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 — Add the points in the boxes above	5

Rating of Landscape Potential If score is: 5 **4-9 = H** ___ **1-3 = M** ___ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 X It has 3 or more priority habitats within 100 m (see Appendix B) X It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) X It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: X **2 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland 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 wetlands 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 Is the wetland **less than 4000 ft²**, 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. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.* — The soil in the wetland is shallow [< 1 ft (30 cm)deep] 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 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 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 meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — 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. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** (No) – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** (No) = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 3.4** (No) = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** (No) = **Not a WHCV**	**Cat. I**

Wetland name or number B

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils.* Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in 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 an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 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 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2** SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3** SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4** SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. I** **Cat. I** **Cat. 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 Summary Form	

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

X **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*).

X **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland 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 – see web link above*).

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

X **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 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

X **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 > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **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).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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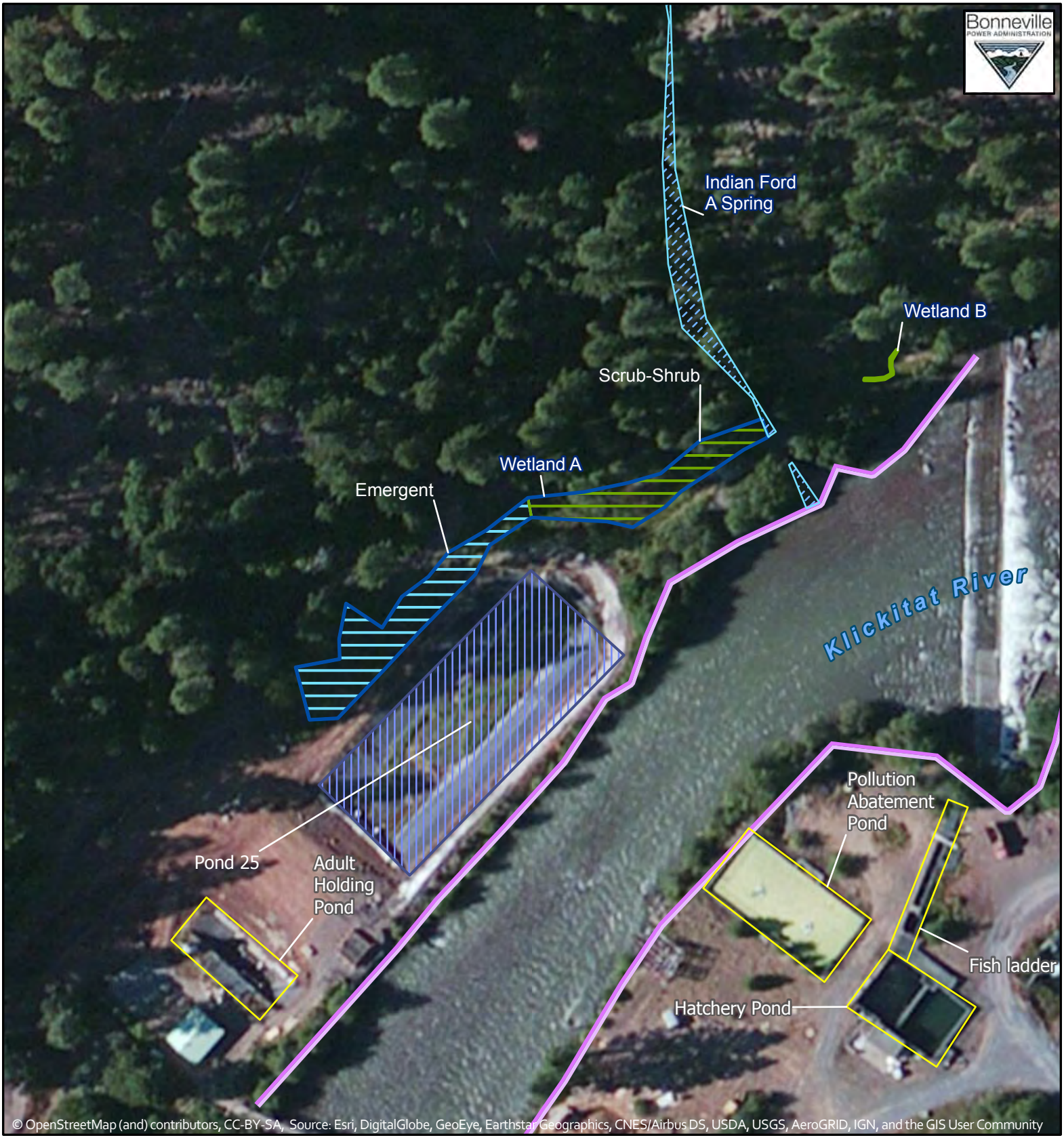


Klickitat Hatchery Project
Figure 1: Cowardin Vegetation Classes

In: Klickitat River
County: Klickitat, Yakima
State: WA
Datum: WGS 84

Constructed Basin
Wetland A
Indian Ford A Spring
Wetland B
Pond 25
Ordinary High Water

CowardinClasses
Emergent
Scrub-Shrub

N
W E
S

0 50 100 200
Feet

Map Date 9/13/2019 11:36 AM

Klickitat Hatchery Project
Figure 2: Hydroperiods

In: Klickitat River
County: Klickitat, Yakima
State: WA
Datum: WGS 84

Pond 25
Wetland A
Indian Ford A Spring
Wetland B

Ordinary High Water

Hydroperiod
Saturated Only
Seasonally Flooded/ Inundated

N
W E
S

0 50 100 200
Feet

Map Date 9/13/2019 11:35 AM

Klickitat Hatchery Project
Figure 3: Boundary of Area within 150-feet of Wetland

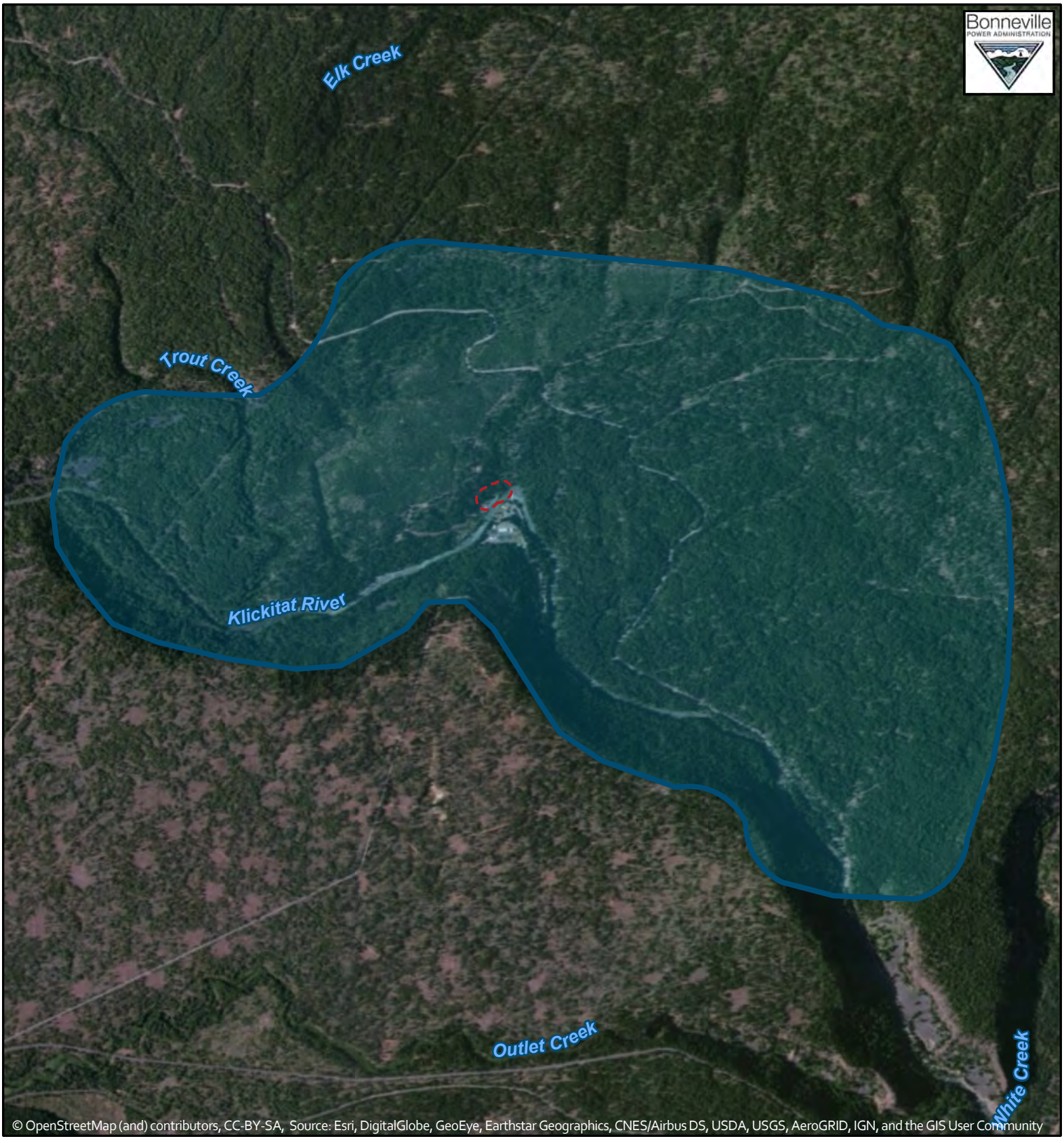
In: Klickitat River
County: Klickitat, Yakima
State: WA
Datum: WGS 84

Pond 25
Wetlands A and B
Indian Ford A Spring
150ft Buffer
Ordinary High Water
Constructed Basin

N
W E
S

0 50 100 200
Feet

Map Date 9/13/2019 11:28 AM



Klickitat Hatchery Project
Figure 4: Contributing Basin

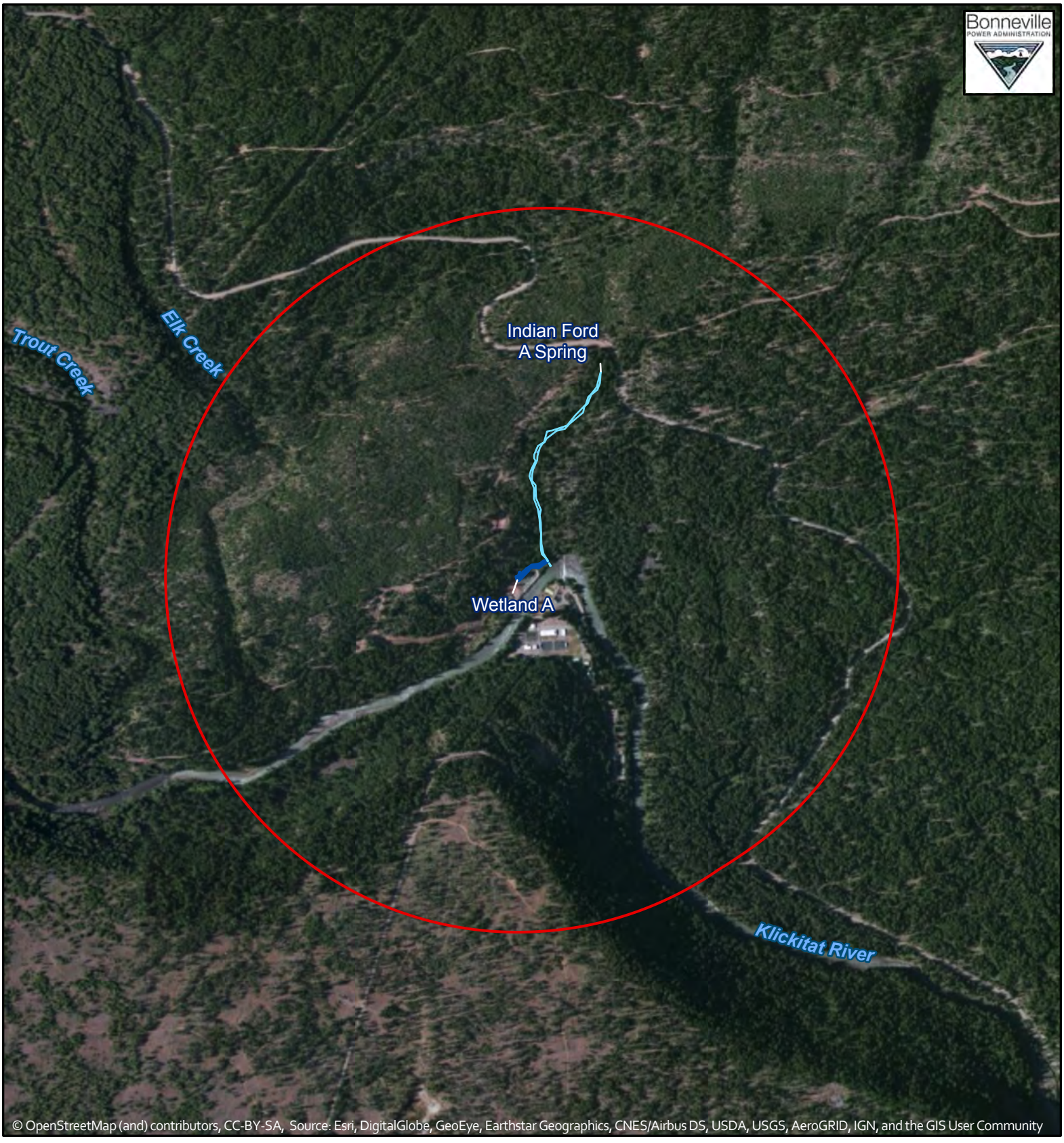
In: Klickitat River
County: Klickitat, Yakima
State: WA
Datum: WGS 84

150ft Buffer
Local Basin

N
W E
S

0 0.25 0.5 1
Mile

Map Date 8/27/2018 2:04 PM



Klickitat Hatchery Project
Figure 5: 1 Km Buffer

In: Klickitat River
County: Klickitat, Yakima
State: WA
Datum: WGS 84

Wetland A
Indian Ford A Spring
1 Km Buffer

N
W E
S

0 0.25 0.5 1
Mile

Map Date 10/17/2018 10:21 AM

APPENDIX D

Historic Aerial Photographs from 1969, 1996 and 2013

1969

1996

2013

APPENDIX E

Jurisdictional Determination Request

Appendix 1 - REQUEST FOR CORPS JURISDICTIONAL DETERMINATION (JD)

To: District Name Here
Seattle District

- I am requesting a JD on property located at: 300 Fish Hatchery Rd.
  (Street Address)
  City/Township/Parish: Glenwood County: Klickitat State: WA
  Acreage of Parcel/Review Area for JD: 19.47 acres
  Section: 4 Township: 6N Range: 13E
  Latitude (decimal degrees): 46.04249 Longitude (decimal degrees): -121.184
  (For linear projects, please include the center point of the proposed alignment.)
- Please attach a survey/plat map and vicinity map identifying location and review area for the JD.
- ___ I currently own this property. ___ I plan to purchase this property.
  ✓ I am an agent/consultant acting on behalf of the requestor.
  ___ Other (please explain): _____
- Reason for request: (check as many as applicable)
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all aquatic resources.
  ___ I intend to construct/develop a project or perform activities on this parcel which would be designed to avoid all jurisdictional aquatic resources under Corps authority.
  ✓ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps, and the JD would be used to avoid and minimize impacts to jurisdictional aquatic resources and as an initial step in a future permitting process.
  ___ I intend to construct/develop a project or perform activities on this parcel which may require authorization from the Corps; this request is accompanied by my permit application and the JD is to be used in the permitting process.
  ___ I intend to construct/develop a project or perform activities in a navigable water of the U.S. which is included on the district Section 10 list and/or is subject to the ebb and flow of the tide.
  ___ A Corps JD is required in order to obtain my local/state authorization.
  ___ I intend to contest jurisdiction over a particular aquatic resource and request the Corps confirm that jurisdiction does/does not exist over the aquatic resource on the parcel.
  ___ I believe that the site may be comprised entirely of dry land.
  ___ Other: _____
- Type of determination being requested:
  ✓ I am requesting an approved JD.
  ___ I am requesting a preliminary JD.
  ___ I am requesting a "no permit required" letter as I believe my proposed activity is not regulated.
  ___ I am unclear as to which JD I would like to request and require additional information to inform my decision.

By signing below, you are indicating that you have the authority, or are acting as the duly authorized agent of a person or entity with such authority, to and do hereby grant Corps personnel right of entry to legally access the site if needed to perform the JD. Your signature shall be an affirmation that you possess the requisite property rights to request a JD on the subject property.

*Signature: Travis Kessler Date: 9/26/19

- Typed or printed name: Travis Kessler
  Company name: Bonneville Power Administration
  Address: 905 NE 11th Ave.
  Portland, OR 97232
  Daytime phone no.: (503) 230-5468
  Email address: tdkessler@bpa.gov

*Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Program of the U.S. Army Corps of Engineers; Final Rule for 33 CFR Parts 320-332.
Principal Purpose: The information that you provide will be used in evaluating your request to determine whether there are any aquatic resources within the project area subject to federal jurisdiction under the regulatory authorities referenced above.
Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public, and may be made available as part of a public notice as required by federal law. Your name and property location where federal jurisdiction is to be determined will be included in the approved jurisdictional determination (AJD), which will be made available to the public on the District's website and on the Headquarters USACE website.
Disclosure: Submission of requested information is voluntary; however, if information is not provided, the request for an AJD cannot be evaluated nor can an AJD be issued.

July 10, 2018

Klickitat River

Assessed Waters/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Miles
0 0.25 0.5 1

DEPARTMENT OF ECOLOGY
State of Washington

EPA United States Environmental Protection Agency

Watershed Quality Assessment Report

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On This Page

Washington State Report

For More Information:

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- EPA Clip N Ship

Water Quality Data Available for this Watershed

Search for a waterbody within Klickitat

Enter Waterbody Name:

Search

Assessment Summary for Reporting Year 2008

Washington, Klickitat Watershed

No assessment data have been reported to EPA for this watershed.

Causes of Impairment for Reporting Year 2008

Washington, Klickitat

No impairment data have been reported to EPA for this watershed.

Probable Sources Contributing to Impairments for Reporting Year 2008

Washington, Klickitat Watershed

No probable sources data have been reported to EPA for this watershed.

TMDL Alternatives by Cause of Impairment for Reporting Year 2008

Washington, Klickitat Watershed

No TMDL Alternatives reported.

Cumulative TMDLs by Pollutant

Washington, Klickitat Watershed

This chart includes TMDLs since October 1, 1995.

Description of this table

NOTE: Click on the underlined "Number of TMDLs Completed" value to see a listing of those approved TMDLs for the pollutant.

Pollutant	Number of TMDLs Completed	Number of Causes of Impairment Addressed
Temperature	8	8
Biochemical Oxygen Demand (BOD)	2	2
Ammonia Nitrogen	1	1

Total: 11 TMDLs; 0 Causes of Impairment

Search TMDL Documents

Full Text Search of TMDL Documents

July 10, 2018

BONNEVILLE POWER ADMINISTRATION
DOE/BP-5234 ▪ March 2023