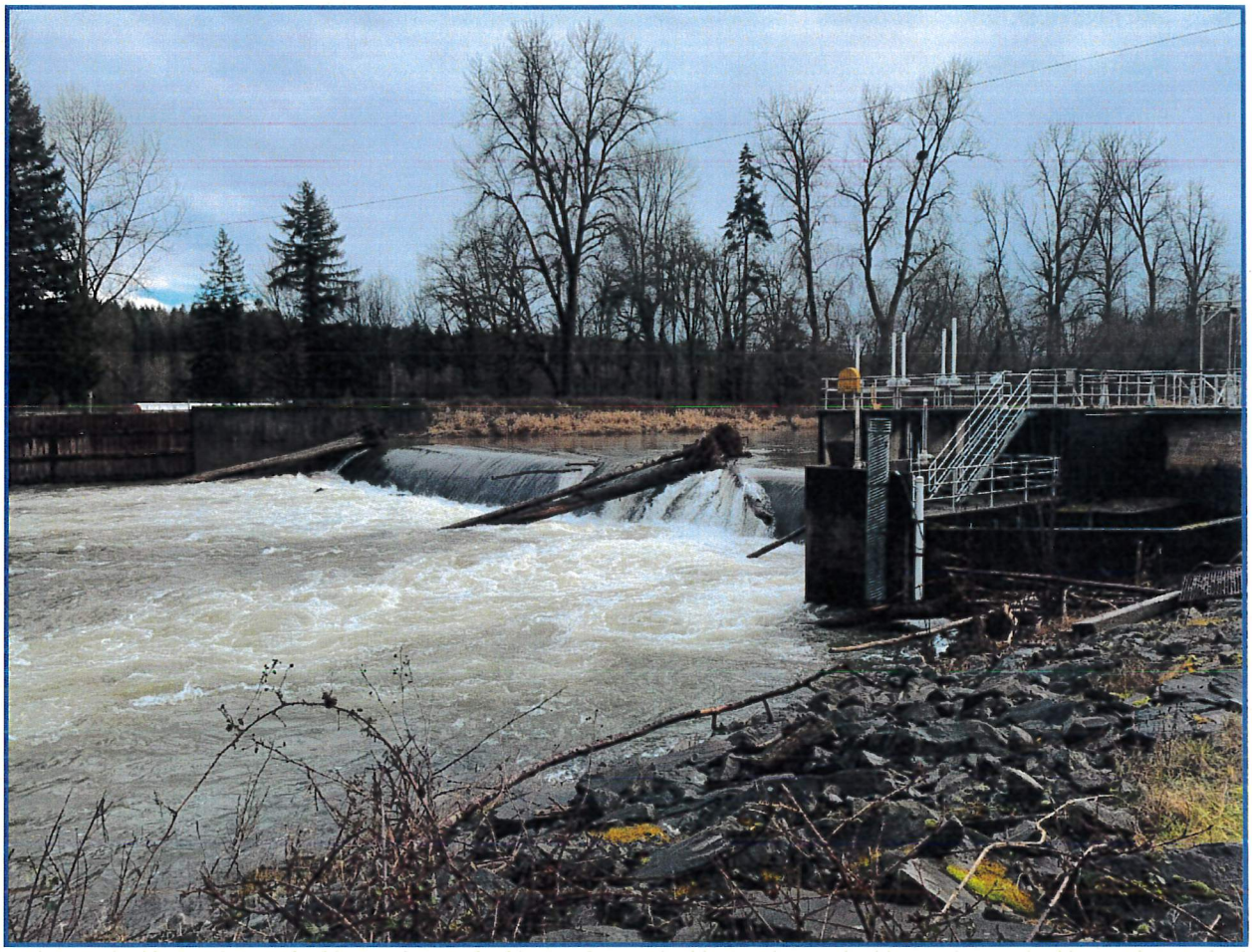
Centralia Hydro Dam – Fish Trap Lift & Facility

Floodplain Habitat Assessment



Prepared For:
Nisqually Indian Tribe

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1. Project Area Description

The Centralia Hydro Dam Fish Trap Lift & Facility (Project) is located within Thurston County at the Centralia Hydro Dam along the banks of the Nisqually River approximately 4 miles south of McKenna, Washington near 20,000 Cook Rd SE, Yelm. The Project area is located in Section 01 Township 162E at approximately 46.899613 °N, -122.498117 °W. The Project area falls within Parcel 22601210100, which is owned by the City of Centralia. The land cover of the Project area consists of open maintained field, forested riparian areas, riverine wetland habitat, and adjacent rural and agricultural areas. Land use within the Project area and the surrounding area is zoned as Rural Residential Resource (1/5) in the Thurston County Online Permitting Map. The subject parcel is part of the Yelm Hydro Project-Wildlife Refuge and is located within the 11-Nisqually Water Resource Inventory Area (WRIA). The Project area is located in the 171100150301 – Murray Creek – Nisqually River HUC 12 watershed. The adjacent Nisqually River is listed on the DNR Forest Practices Water Typing Mapper as Type S, a shoreline of the state. The adjacent Centralia Canal is listed on the DNR Forest Practices Water Typing Mapper as Type N, a non-fish bearing stream.

This Project proposes to construct an adult salmon trap within the existing fish ladder at the Centralia Hydro Dam. It is a key element of the Salmon Recovery Plan from the Nisqually Tribe and the Washington Department of Fish & Wildlife (WDFW). Two gates will block fish passage up the fish ladder directing fish into the trap area. The trap area will have a floor that lifts to allow staff to capture the fish with nets and put them into a cable lift system to a roofed 18' x 15' open-walled sorting facility on a cement slab. The sorting area includes fish troughs for handling, enumerating, scientific sampling, and tagging. There will be return pipes back to the fish ladder for returning fish upstream. A small 10' x 20' mobile office, portable toilet, and hand washing station will also be present on site. Overall cut and fill that will result from the construction of the proposed project will consist of 30 CY of cut due to the construction of the structure and associated cement slab within the floodplain and 30 CY of fill associated with grading activities within the floodplain.

No fill below the ordinary high water mark or within a wetland will result from this project. No bank armoring is proposed, and no large woody debris located within riparian areas along the Nisqually River will be disturbed. However, the Project is located within a wetland buffer. Large forested and emergent wetlands are located along the banks and within the floodplain of the Nisqually River throughout the region. The Category II Riverine wetland delineated downstream of the Centralia Hydro Dam has a very large 280 ft buffer. According to the National Wetlands Inventory (NWI) Mapper, there are wetlands located all along the Nisqually River and within the floodplain outside of the planned project area. The wetlands are listed as Freshwater Forested/Shrub Wetland, and it is likely they would be similar in category and have a similar buffer size to the one delineated nearby. Therefore, it would be difficult to find a location for this Project that does not impact wetland buffers at a minimum while still meeting the purpose and needs of the project.

Multiple alternatives were evaluated prior to deciding upon the final project design. Site constraints, minimizing potential effects on collected fish, environmental impacts, and cost were some factors which lead to this preferred design. An Archimedes screw type fish transport system was evaluated but was determined to result in too great of stress on fish species and would have required a larger area for the recovery tank needed for fish to recover from sampling. A salmon cannon system was also evaluated but would require additional personnel limiting infrastructure to be mounted to the dam and would result in impacts to handled fish, as they become disoriented. Additionally, fish could not be seen re-entering the water with this system. A conveyor system was evaluated as an alternative means of transporting the fish, which could result in a structure that could be placed further from the river; however, this would not be durable under flood conditions and the additional transport time could cause stress to the collected fish. A completely stand-alone trap system was evaluated as an option, which would have been located downstream. However, this was ruled out as it would have involved considerable in-water work, a stream diversion, and placing concrete in the river channel. The impacts to the natural environment would have been the largest with this stand-alone system.

The entire area between the Nisqually River and the Centralia Canal is designated as a special flood hazard area. The project could not be constructed farther away, on the other side of the Centralia Canal for example, as additional infrastructure would be needed and the project would still result in disturbance within a wetland buffer and the special flood hazard area, and the increased distance would cause increased stress on the collected fish. As such, avoidance of all impacts was not possible for this project. Impacts were minimized by designing a fish trap within the existing dam structure to the extent possible with a sampling platform located at the right elevation to safely return fish via a gravity pipe which is the gentlest and quickest method. Sampling and associated structures were planned in open, previously disturbed areas to avoid clearing riparian vegetation and trees and impacting wetlands within the floodplain area. As the key to salmon recovery in the Nisqually is to be able to count, sample, acquire broodstock, and analyze the runs, the fish need to be removed from the system safely, sampled from a shallow trough, and allowed to recover before reentering the system. It is important that this process happen as quickly as possible to minimize stress on the fish. This project was designed to be as close to the water edge as possible for the safety of the fish, while minimizing impacts and modifications to the dam. The best alternative was to construct something immediately adjacent to the dam. Any other location would be detrimental to the recovery of the species, adversely impact a federally regulated dam, or result in additional wetland and/or floodplain impacts.

The project has been designed to result in the least environmental impact. The final design will result in no loss of flood storage and is not anticipated to result in a loss of refugia for ESA species during flood events. Minimal buffer impacts will result outside of the floodplain and will be addressed under a separate mitigation plan if required by the county. Please refer to Section 5 for additional information.

The purpose of the entirety of the project is to improve the fish returns on the Nisqually River and increase the number of ESA fish in the system. Through sampling, collection, and safely returning fish above the dam, the intent is to help ESA listed species thrive in the Nisqually River.

Figure 1 depicts the Overall Site Plan with a topographic background. Figure 2 depicts the Project Area and significant features as described above with an aerial imagery background.

Figure 1: Overall Site Plan.

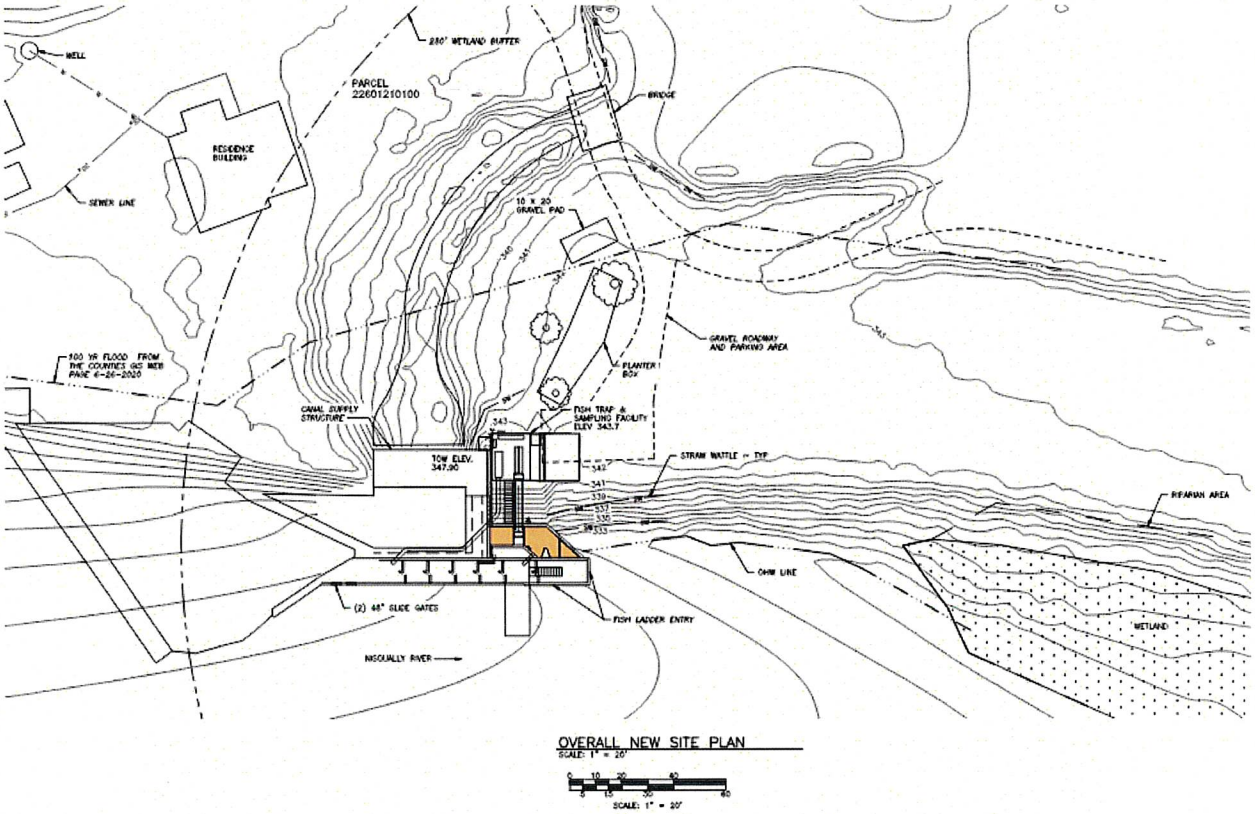
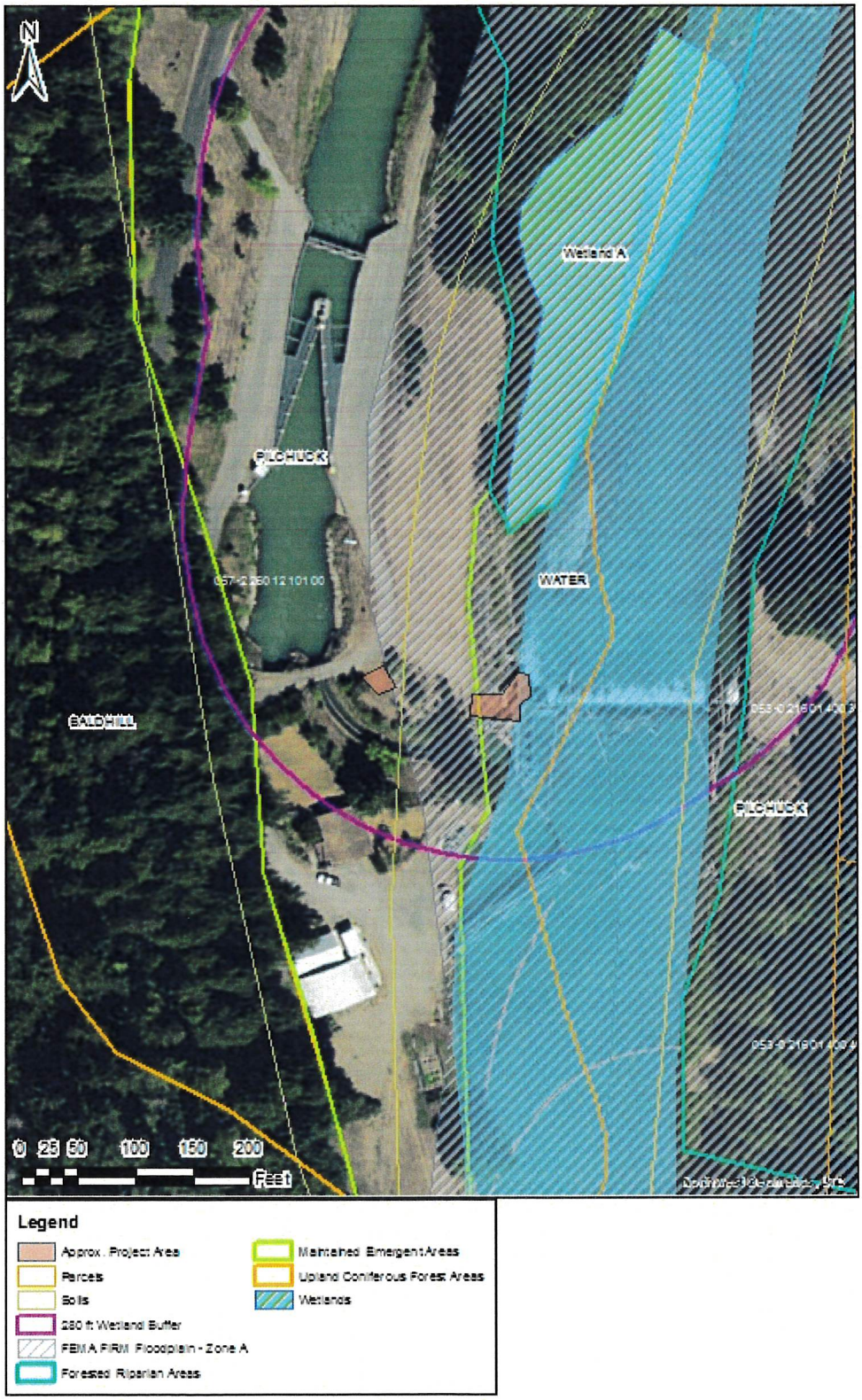


Figure 2: Project Area and Significant Features.

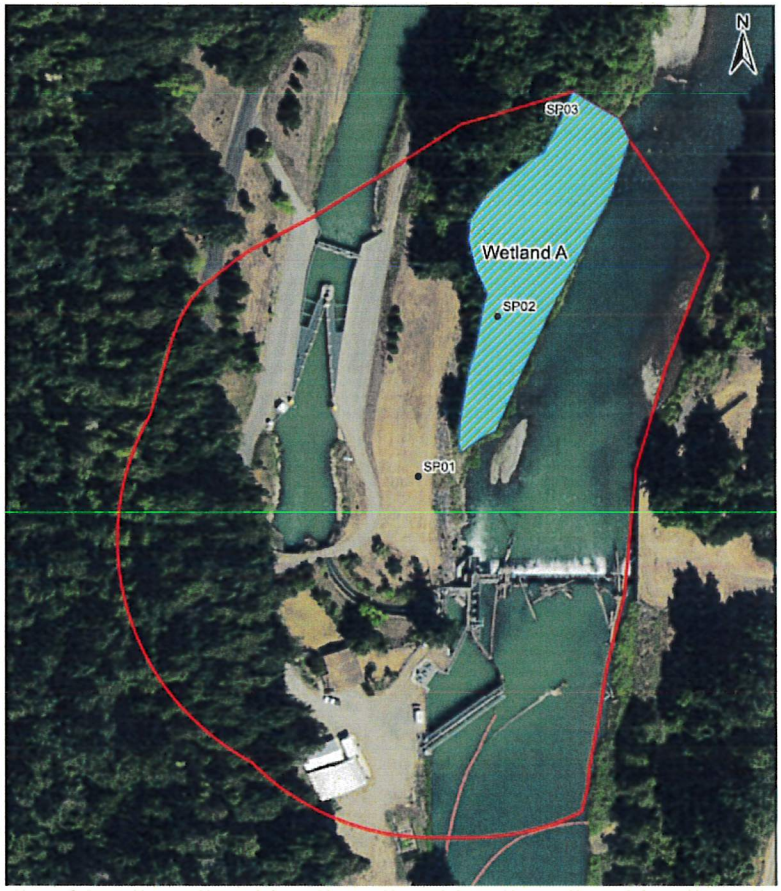


2. Background Research

Prior to the field evaluation, a desktop review of the Project area was conducted to aid in the assessment of aquatic resources and to provide background and historical information relating to the site. Current and historical aerial photographs, existing county reports and databases, and other public resources were reviewed including USGS 7.5-minute topographic maps, United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) maps, Federal Emergency Management Agency (FEMA) 100-Year floodplain maps, and soil survey maps from the Natural Resources Conservation Service (NRCS).

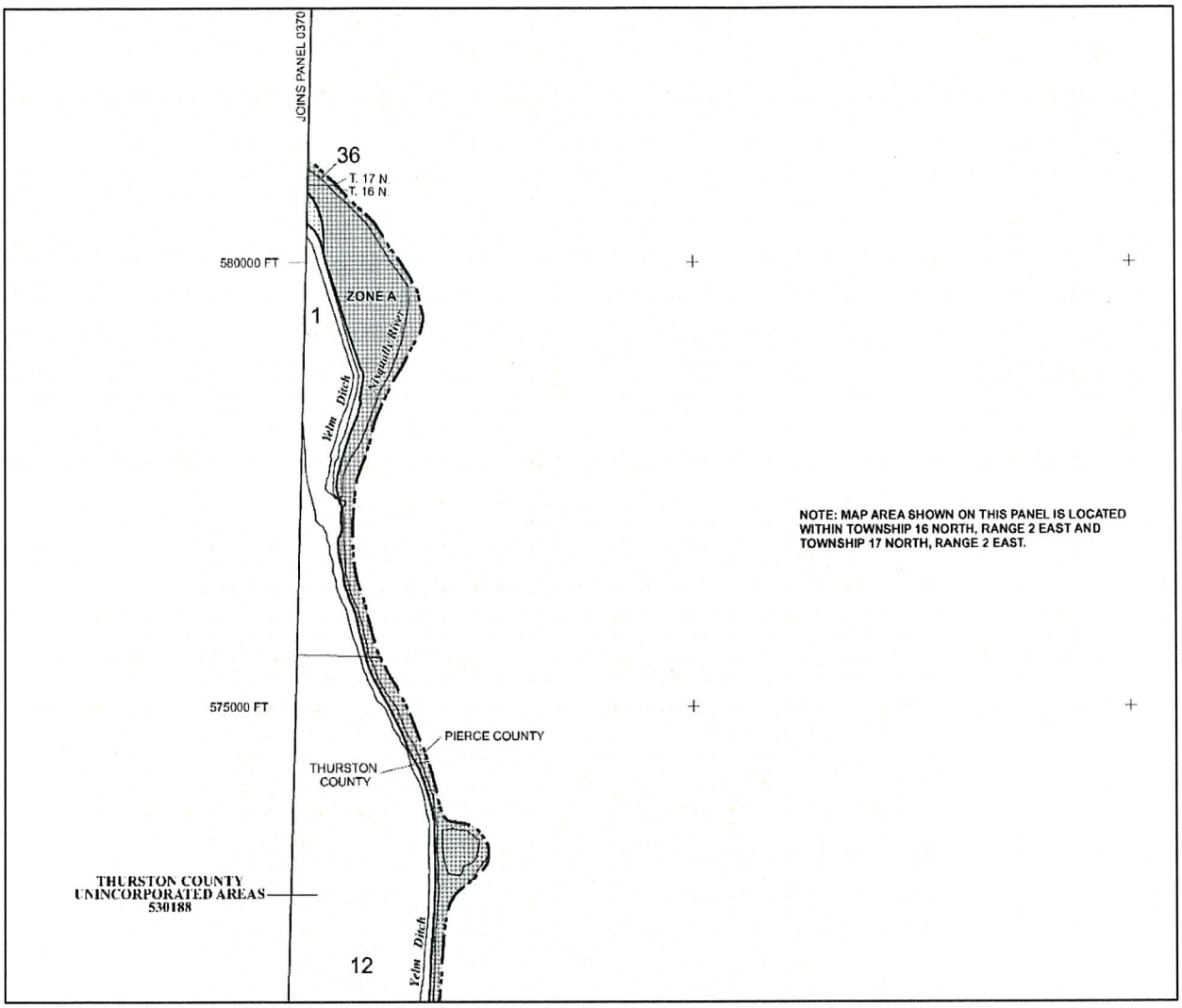
The NWI Program administered by the USFWS is responsible for the mapping and inventory of major wetlands and wetland systems within the United States. The USFWS Wetlands Mapper was used to review NWI wetlands within the AOI. Based on USFWS Wetlands Mapper, two (2) NWI wetlands were identified within the AOI. The R3UBH wetland (riverine, upper perennial, unconsolidated bottom, permanently flooded) consists of the Nisqually River. The PFOC wetland (palustrine, forested, seasonally flooded) appears much larger than the forested, riverine Wetland A that was delineated on site by CAMP but is located in roughly the same area. Figure 3 depicts the location of Wetland A relative to the existing Centralia Hydro Dam.

Figure 3: Location of Wetland A (The red boundary is the wetland delineation area of interest).



The applicable FEMA Flood Insurance Rate Map (FIRM) depicting the Project area was reviewed to aid in the evaluation of habitat on site. Panel No. 53067C0390E depicts the Project area as Zone A, a special flood hazard area with no base flood elevations determined. Figure 4 depicts the FEMA FIRM of the Project area.

Figure 4: FEMA FIRM of the Project Area



The NRCS Web Soil Mapper identified two soil units occurring within the Project area as shown in **Table 1**.

Table 1: Mapped Soil Units Within the Project Area in Thurston County			
Map Unit Symbol	**Name**	**Slope**	**Hydric Rating**
8	Baldhill very stony sandy loam	30 to 60 percent	0
89	Puyallup Silt Loam	0 to 3 percent	3

According to the Washington State Department of Ecology's Water Quality Atlas, the reach of the Nisqually River adjacent to Wetland A and the Project area is not listed on the 303(d) list. A total maximum daily load (TMDL) for temperature is present for the Nisqually River near its confluence with the Puget Sound. This same reach of the Nisqually River is listed as a Category 2 water, or water of concern, for Chromium and a Category 4C water, which corresponds with an impaired water that does not require a TMDL, for the identification of Brazilian Elodea (*Egeria densa*) an invasive and non-native aquatic plant. The Nisqually River is listed as a Category 2 Water for Bacteria approximately 3 miles north of the Project area in McKenna. The Project area is located in the 171100150301 – Murray Creek – Nisqually River HUC 12 watershed. Nearby Harts Lake is also located within this watershed and is listed on the 303(d) list for Total Phosphorus. There are no approved or in development water quality improvement projects located within this watershed. The closest water quality improvement project is the Deschutes, Percival, and Budd Inlet Watersheds TMDL.

Wetland A is not listed as a wetland of high conservation value on the Washington State Department of Natural Resources (DNR) Wetlands of High Conservation Value Map Viewer. According to the WDFW Priority Habitat and Species database, the Project area is mapped as priority habitat due to the presence of freshwater forested/shrub wetland, riverine aquatic habitat, and terrestrial habitat biodiversity areas and corridors. According to the WDFW SalmonScape fish distribution database, Fall Chinook Salmon, Coho Salmon, Winter Chum Salmon, Sockeye Salmon, Dolly Varden/Bull Trout, Resident Coastal Cutthroat Trout, Winter Steelhead, and Pink Odd Year Salmon are listed as documented presence in the Nisqually River. According to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) database, the Nisqually River is mapped as essential fish habitat for Chinook Salmon, Coho Salmon, and Puget Sound Pink Salmon. The Nisqually River is designated as critical habitat by the NOAA Fisheries Protected Resources App for Chinook and Steelhead.

The Project area was also reviewed using the USFWS Information for Planning and Consultation (IPaC) which identified ten threatened or endangered species that could potentially be affected by activities at this location; additionally, critical habitat for the Bull Trout was mapped within the Nisqually River. The threatened and endangered species are the Olympia Pocket Gopher, Tenino Pocket Gopher, Yelm Pocket Gopher, Marbled Murrelet, Streaked Horned Lark, Yellow-billed Cuckoo, Oregon Spotted Frog, Bull Trout, and the Golden Paintbrush and Water Howellia, which are flowering plants. There are no migratory birds of conservation concern expected to occur at this location.

3. Protected Species Identification

The desktop review of the Project area and critical habitats on site resulted in a number of protected species that should be considered in this habitat assessment. Table 2 outlines the species, their Endangered Species Act (ESA) status, and presence of critical habitat.

Table 2: Occurrence of Listed Species and Critical Habitat in or Near the Project Area

Common Name	Scientific Name	ESA Status	Jurisdiction	Critical Habitat Present
Puget Sound Evolutionarily Significant Unit (ESU) Chinook Salmon	*Oncorhynchus tshawytscha*	Threatened	NMFS	Critical Habitat Present per the FPRA, Essential Fish Habitat Present per NMFS EFH Mapper
Puget Sound Distinct Population Segment (DPS) Steelhead	*Oncorhynchus mykiss*	Threatened	NMFS	Critical Habitat Present per the FPRA
Coho Salmon	*Oncorhynchus kisutch*	N/A	NMFS	Essential Fish Habitat Present per NMFS EFH Mapper
Puget Sound Pink Salmon	*Oncorhynchus gorbuscha*	N/A	NMFS	Essential Fish Habitat Present per NMFS EFH Mapper
Bull Trout	*Salvelinus confluentus*	Threatened	USFWS	Critical Habitat Present per IPaC
Olympia, Tenino, and Yelm Pocket Gophers	*Thomomys mazama pugetensis, Thomomys mazama tumuli, Thomomys mazama yelmensis*	Threatened	USFWS	Location of Critical Habitat is Not Available per IPaC

Chinook Salmon, Steelhead, Coho Salmon, and Pink Salmon are anadromous and use of the Nisqually River for spawning has been documented. All these species face threats from habitat loss and degradation, commercial and recreational fishing, and impediments, such as dams which restrict access to their freshwater spawning systems. Historical habitat degradation has occurred largely from agricultural practices and logging operations.

Chinook Salmon have many different ESUs, two are endangered and seven are listed as threatened under the ESA, including the Puget Sound ESU. Chinook Salmon, also known as king salmon, can live up to 6 years and are found along the West coast of North America from the Chukchi Sea area of Alaska to the Monterey Bay area of California. They are the largest species of the Pacific Salmon and can grow up to 4.9 feet in length and 120 pounds; however, 3 feet long and 30 pound fish are more common. This species has a black pigment along their gum line and black spots on the upper body and on both tail fin lobes. Spawning

adult males have a hooked upper jaw. When spawning, this species develops an olive brown, red, or purple coloration.

Coho Salmon, also called silver salmon, are found along the West coast of North America and into Asia. There are four different Coho Salmon ESUs, one is endangered and the other three are threatened. Coho Salmon average 8 pounds in weight and 2 feet in length; however, they can weigh up to 35 pounds. Some Coho Salmon migrate 1,000 miles or more in the ocean, and others stay close to the freshwater systems from which they spawned. Coho Salmon have a lighter gumline than Chinook Salmon and develop a dark red or maroon color on their sides when in freshwater to spawn. Spawning males have large teeth and develop a strongly hooked snout.

Steelhead are a trout species that hatch in fast-moving rivers and streams with gravel substrate. Some Steelhead remain in freshwater while others migrate to the ocean and return to freshwater systems to spawn. One DPU is endangered and ten are threatened, including the Puget Sound DPU. Steelhead can live up to 11 years, grow up to 45 inches long and 55 pounds in weight. They are found along the West Coast of North America and into Asia. Adult steelhead vary widely in coloration depending on their habitat but can be distinguished by a wide reddish stripe along the sides.

Pink Salmon are the smallest but most abundant Pacific salmon species. They have a two-year lifecycle and return to the freshwater systems to spawn and ultimately die in either odd or even years. In Washington, Pink Salmon return to spawn on odd years. Pink Salmon are found along the West coast of North American from Alaska to central California and into Asia. Pink salmon have large dark spots on their back and entire tail fin. Spawning males develop a hump on their back and a hooked jaw, and red coloration with brownish green blotches. Spawning females do not develop the hump or hooked jaw and are not as distinctly colored as the males.

The Bull Trout is the only species identified by USFWS as having critical habitat at the Project location. The Puget Sound DPS extends across Thurston County. Water diversions and dams, habitat degradation, and competition with non-native species are just some of the threats this species faces. Bull Trout have specific habitat requirements that are more restrictive than other salmonid species. According to the USFWS (2004), Bull Trout distribution and abundance are influenced by water temperature, cover, channel form and stability, valley form, spawning and rearing substrate, and migratory corridors. Cold water temperatures, complex cover types and structures, stable streams, natural flow patterns, and two-way passage up and downstream are some of the necessary habitat features this species requires. Bull Trout are iteroparous, meaning they survive spawning year after year, which is why they require the two-way passage in freshwater rivers and streams.

The three subspecies of Mazama Pocket Gophers found in Thurston County are the Olympia, Tenino, and Yelm Pocket Gophers. These pocket gophers range from 6 to 9 inches in length and have external pockets on the sides of their mouths. They live most of their life entirely below ground and require specific soils to inhabit an area. They prefer prairie habitat that is relatively open with short vegetation and few trees. These pocket gophers produce one litter of 5 pups on average per year and prefer to live alone once juveniles have left to make their own tunnel system.

Primary Constituent Elements (PCEs) are physical or biological habitat components required for ESA listed species and are published in the Federal Register (FR). PCEs for the protected species in Table 2 are outlined below.

<u>According to 70 FR 52629, the PCEs for West Coast Salmon and Steelhead in Washington, Oregon, and Idaho are</u>:

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.
2. Freshwater rearing sites with:
    a. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility
    b. Water quality and forage supporting juvenile development
    c. Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks
3. Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.
4. Estuarine areas free of obstruction and excessive predation with:
    a. Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater
    b. Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels
    c. Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation
5. Nearshore marine areas free of obstruction and excessive predation with:
    a. Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation
    b. Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels
6. Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

<u>According to 70 FR 56211, the PCEs for Bull Trout are</u>:

1. Water temperatures that support bull trout use. Bull trout have been documented in streams with temperatures from 32 to 72 °F (0 to 22 °C) but are found more frequently in temperatures ranging from 36 to 59 °F (2 to 15 °C).

2. Complex stream channels with features such as woody debris, side channels, pools, and undercut banks to provide a variety of depths, velocities, and instream structures.
3. Substrates of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. This should include a minimal amount of fine substrate less than 0.25 inch (0.63 centimeter) in diameter.
4. A natural hydrograph, including peak, high, low, and base flows within historic ranges or, if regulated, currently operate under a biological opinion that addresses bull trout, or a hydrograph that demonstrates the ability to support bull trout populations by minimizing daily and day-to-day fluctuations and minimizing departures from the natural cycle of flow levels corresponding with seasonal variation.
5. Springs, seeps, groundwater sources, and subsurface water to contribute to water quality and quantity as a cold water source.
6. Migratory corridors with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and foraging habitats, including intermittent or seasonal barriers induced by high water temperatures or low flows.
7. An abundant food base including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
8. Permanent water of sufficient quantity and quality such that normal reproduction, growth, and survival are not inhibited.

<u>According to 79 FR 19711, the PCEs for Mazama Pocket Gophers are</u>:

1. Soils that support the burrowing habits of the Mazama pocket gopher, and where the four Thurston/Pierce subspecies of the Mazama pocket gopher may be found. These are usually friable, loamy, and deep soils, some with relatively greater content of sand, gravel, or silt, all generally on slopes less than 15 percent. Most are moderately to well-drained, but some are poorly drained.
    a. Olympia pocket gopher (*Thomomys mazama pugetensis*) soils include the following soil series or soil series complex: Alderwood, Cagey, Everett, Godfrey, Indianola, Kapowsin, McKenna, Nisqually, Norma, Spana, Spanaway, Spanaway-Nisqually complex, and Yelm.
    b. Tenino pocket gopher (*Thomomys mazama tumuli*) soils include the following soil series or soil series complex: Alderwood, Cagey, Everett, Indianola, Kapowsin, Nisqually, Norma, Spanaway, Spanaway-Nisqually complex, and Yelm.
    c. Yelm pocket gopher (*Thomomys mazama yelmensis*) soils include the following soil series or soil series complex: Alderwood, Cagey, Everett, Godfrey, Indianola, Kapowsin, McKenna, Nisqually, Norma, Spanaway, Spanaway-Nisqually complex, and Yelm.
2. Areas equal to or larger than 50 ac (20 ha) in size that provide for breeding, foraging, and dispersal activities, found in the soil series or soil series complexes listed in (1), above, that have:
    a. Less than 10% woody vegetation cover.
    b. Vegetative cover suitable for foraging by gophers.
    c. Few, if any, barriers to dispersal within the unit or subunit. Barriers to dispersal may include, but are not limited to, forest edges, roads (paved and unpaved), abrupt elevation

changes, Scot's broom thickets, highly cultivated lawns, inhospitable soil types or substrates, development and buildings, slopes greater than 35 percent, and open water.

4. Site Investigation

CAMP staff conducted a site investigation on February 3, 2021 to determine if there are habitat areas present within the Project area that the protected species identified in Section 3 have a of primary association with. These habitats of primary association include the PCEs and critical components of the habitats which, if altered, may reduce the likelihood of long-term survivability and reproduction.

Habitats of primary association for West Coast Salmon and Steelhead in Section 3 that are present within and surrounding the Project area are:

1. Freshwater spawning sites
2. Freshwater rearing sites
3. Freshwater migration corridors

Habitats of primary association for Bull Trout that are present within and surrounding the Project area are:

1. Water temperatures that support bull trout use.
2. Substrates of sufficient amount, size, and composition.

No habitats of primary association for the Olympia, Tenino, and Yelm Pocket Gophers are present within the Project area, as soils on site are not favorable to the species. The NRCS Web Soil Mapper identified two soil units within the Project area in Thurston County: Puyallup silt loam and Baldhill very stony silt loam. Neither of these soil types are listed in the Federal Register as supporting burrowing habits of the listed Pocket Gophers. Additionally, consultation with USFWS has determined that the species are not likely to occur within the project vicinity.

Existing structures and facilities were identified on site that have the potential to impair the identified habitats of primary association. In-stream habitat, riparian habitat, and the floodplain along the Nisqually River within the Project area have been previously altered by the existing Centralia Hydro Dam facilities and the Centralia Canal. There is a four foot high dam that crosses the Nisqually River. A fish ladder allows fish passage up and downstream of the dam. Bank armoring exists immediately downstream of the dam on the right bank. The 9 mile long Centralia Canal diverts water from the Nisqually River and directs it to the power generating station in the town of Yelm. Existing habitat up and downstream of the Centralia Hydro Dam consists of a wide stream channel characterized by vegetated banks, mainly forested with an emergent fringe, and substrate dominated by cobble, gravel, and sand. Water was fast-moving and dead trees and debris were present in riparian areas at the time of the site visit.

Figure 5: The Existing Centralia Hydro Dam

Figure 6: Habitat Downstream of the Centralia Hydro Dam

Figure 7: Habitat Upstream of the Centralia Hydro Dam

Figure 8: Substrate within the Nisqually River

Figure 9: Large Woody Debris in Riparian Areas

5. Habitat Narrative

This section examines the presence and quality of the natural elements that relate to the PCEs on site for the identified protected species. Freshwater spawning sites must have sufficient water quantity and quality conditions and substrate supporting spawning, incubation and larval development. Freshwater spawning sites meeting these criteria are present along the Nisqually River, in reaches up and downstream of the Project area. Fish returning to the Nisqually River to spawn have sufficient areas outside of the small Project footprint to spawn. The majority of the Project footprint will be located within and adjacent to the existing Centralia Hydro Dam and while there is sufficient water quantity and quality there, the substrate has already been disturbed and altered as part of the construction of the dam.

Freshwater rearing sites must have water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks. Freshwater rearing sites meeting these criteria are present along the Nisqually River, in reaches up and downstream of the Project area. Fish returning to the Nisqually River to rear their young have sufficient areas outside of the small Project footprint to perform these activities. There is no natural cover located immediately within the Project area.

Freshwater migration corridors must be free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival. The Project area will be located immediately adjacent to the existing Centralia Hydro Dam. This dam has a fish ladder which provides a migration corridor for fish species; however, no natural cover is present in the immediate Project area.

Water temperatures in the Nisqually River range from the 50s to the 70s in the summer months and are commonly in the 30s and 40s in winter. Bull trout have been found in streams with temperatures from 32 to 72 °F (0 to 22 °C) but are found more frequently in temperatures ranging from 36 to 59 °F (2 to 15 °C). Therefore, the Nisqually River likely supports water temperatures in the necessary range within the fall when bull trout would be spawning. However, large reaches up and downstream of the Project area would also support the temperature requirements except for the reach near the Puget Sound north of the Nisqually Reservation that has a TMDL and is listed on the 303d list for temperature.

Substrates of sufficient amount, size, and composition to ensure success of Bull Trout egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival are present within the Nisqually River. However, a considerable amount of fine sand was observed around the Project area near the existing dam. This would encourage Bull Trout potentially on site to utilize other reaches of the Nisqually River with a more favorable ratio of sand to gravel or cobble.

Additional variables were assessed to determine if the Project will negatively affect them causing a reduction in the quality or amount of available habitat on site. These variables include: water quality, water temperature and dissolved oxygen, low flow and high flow hydrologic regimes, refugia for ESA-listed fish species from high velocity flows, flood velocities, sediment delivery and regime, stream substrate, floodplain connectivity, and the riparian vegetative community.

Minimal grading will be necessary to construct the fish trap lift and facility, which could result in an increase to turbidity and a temporary decrease in water quality in the stream. The reach of the Nisqually River adjacent to the Project area is not listed on the 303d list and best management practices (BMPs) will be implemented to ensure no reduction in water quality occurs.

No decreases in dissolved oxygen or increases in water temperature are likely to occur as a result of the proposed Project. The Project will involve construction in a previously disturbed area and will remain associated with the existing Centralia Hydro Dam facility. The Project footprint is being kept to a minimum and water quantity and quality will be maintained throughout the Project area.

A no-net rise certification has been completed for the Project by a Professional Engineer. This analysis found that no increase to flood levels will occur from the construction of the proposed Project. The amount of flood storage in the area is controlled by the dam gates and the release of water down the

canal. The entire proposed project is located in an ineffective flow area in the shadow of the existing dam and gate structures itself. Therefore, it only activates when backwatered from downstream. The final design will result in no net fill in the floodplain, therefore there will be no loss of flood storage capacity. No change to the low flow and high flow hydrologic regimes of the Nisqually River are anticipated. No increase to flood velocities will occur as a result of the construction of the proposed Project. A minimal loss of refugia may occur. The area planned for the trap is located within a fish ladder that will still be operational when the trap is not in use. The area planned for the open-walled sampling facility is being constructed on existing impervious surface within and adjacent to the hydro dam. Habitat and refugia in this area are minimal as well and the only impact would result from the placement of the four posts used to support the open-walled structure. There are no side channel, pools, or glides that provide refugia for ESA-listed species within the minimal Project footprint. The area planned for the associated 10' x 20' gravel pad is located outside of the floodplain and within the wetland buffer in an open field. Therefore, constructing these structures should not result in a loss of refugia and floodplain habitat. There will be no displaced flood storage volume due to the no net rise.

Sediment delivery will not be affected, as the existing Centralia Hydro Dam will still function, and any areas disturbed for the construction of the associated structures will be protected by appropriate BMPs during construction and vegetated to ensure no increased rate of surface erosion or loading of sediment to the Nisqually River occurs.

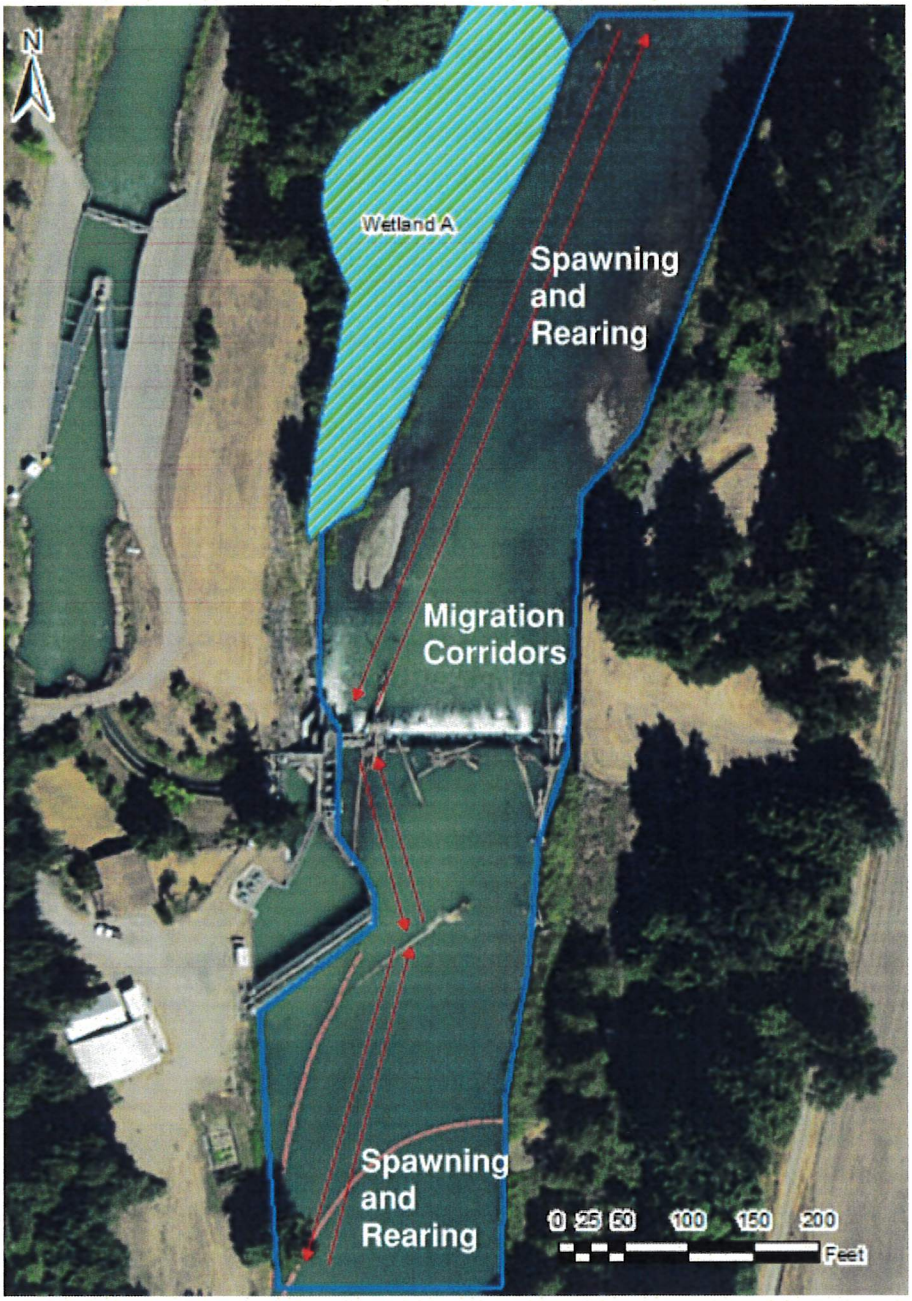
Stream substrate within the Nisqually River near the Project area ranges from cobble to gravel to sand size particles. The actual disturbance within the stream will occur in an area previously disturbed as part of the existing hydro dam fish ladder. The additional associated structures are located outside of the river in an adjacent upland area.

Floodplain connectivity will remain intact, as a small sorting facility and mobile office are the only structures planned outside of the actual fish trap and lift. The structures will not isolate any portion of the floodplain.

The riparian vegetative community will not be affected from the construction of the proposed Project. The structures will be located within areas previously disturbed and currently maintained by the Centralia Hydro Dam. The gravel pad will be located in an open grassy area and won't disturb nearby wetlands or high quality forested riparian areas. The structures have been placed as far as possible from the river but need to be in close association to safely return fish to the river.

Figure 10 shows the habitat areas of primary association within the vicinity of the Project area. A detailed description of final project activities is outlined in the following section.

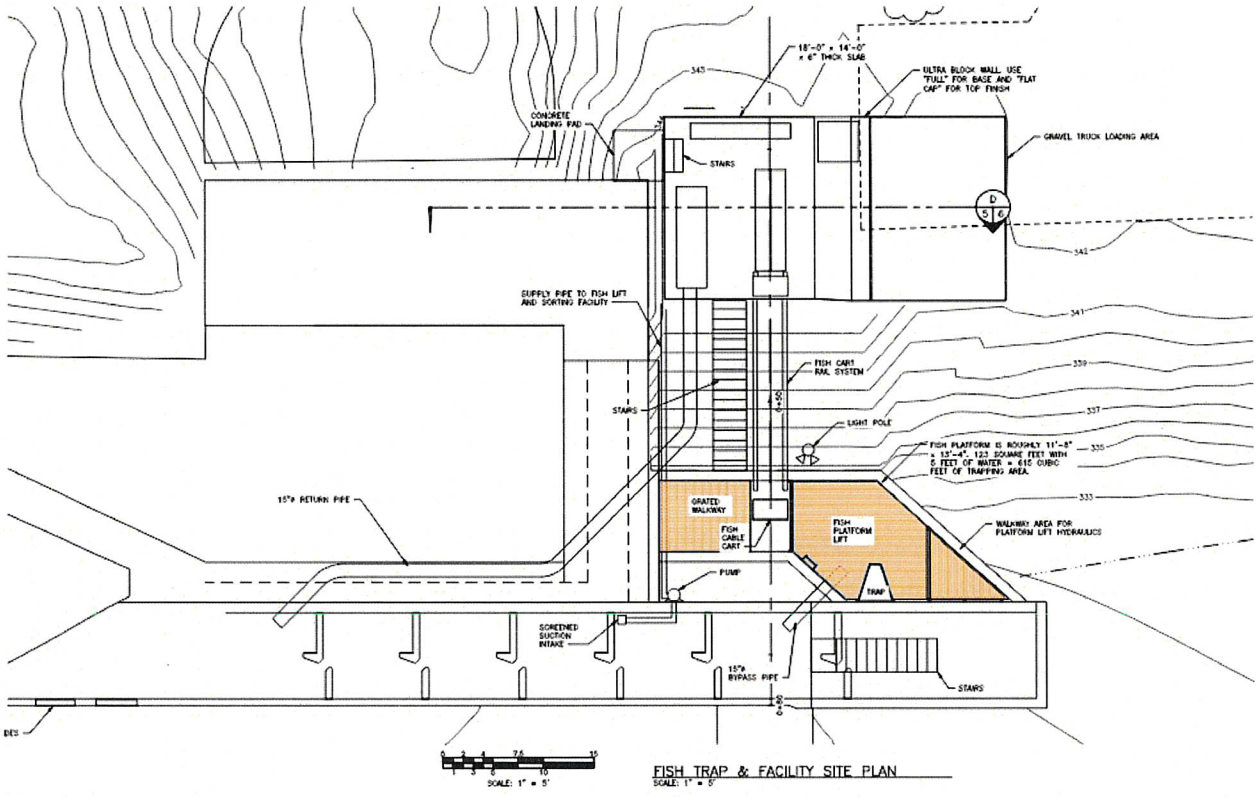
Figure 10: Habitat Area Map



6. Final Project

The final Project will be an adult salmon trap within the existing fish ladder at the Centralia Hydro Dam. This project is a key element of the Salmon Recovery Plan from the Nisqually Tribe and Washington Department of Fish and Wildlife. The fish trap lift is proposed within the fish ladder footprint and will be made of aluminum frames with pickets with proper fish spacing of one inch. Two gates will block the passage up the fish ladder directing fish into the trap area. The trap area will have a floor that lifts approximately five feet to allow staff to capture the fish with nets by hand and put them into a cable lift system which will move the fish up in a cable cart system to a roofed 18' x 15' open-walled sorting facility on a cement slab. The sorting area will include fish troughs for handling, enumerating, scientific sampling, and tagging. There will be return pipes back to the fish ladder for returning fish upstream. River water will be pumped from the fish ladder area up to the sampling area to keep the fish in moving water and this water will be returned back to the fish ladder. A small 10' x 20' gravel pad will also be present on site. This gravel pad will function as a temporary storage area for a mobile trailer which will be utilized for a seasonal sampling events. Power and associated utilities can be seen on the site plan in Figure 11 below.

Figure 11: Fish Trap and Facility Site Plan.



After construction is complete, these facilities will be used and properly maintained by the City of Centralia, WDFW, and the Nisqually Tribe.

7. Construction Process

Before and during construction of the project, specific best management practices (BMPs) will be put in place to manage and minimize any potential impacts to the site. Erosion control BMPs, such as straw wattles or silt fencing, will be in place for the duration of construction and removed as appropriate based on the BMP. Construction storm water will be controlled by use of wattle dams and silt fencing as needed. Disturbed areas on site will be seeded with native grass mix or mulched. Accumulation of soils or debris shall be removed from the drive mechanisms (wheels, tires, tracks, etc.) and undercarriage of equipment prior to its working near water. Equipment shall be checked daily for leaks and any necessary repairs shall be completed prior to commencing work activities near state waters.

8. Protection Measures

During the construction phase of the project, the BMPs listed in Section 7 will be put in place to manage and minimize any potential impacts to the site. Careful design considerations have been taken to limit disturbance to the stream and natural ground within the floodplain of the Nisqually River. The construction of the sampling facility will occur adjacent to the existing Centralia Hydro Dam footprint in an open and currently maintained area. This will limit natural ground disturbance and riparian areas that would otherwise need to be disturbed. The construction of the fish trap will occur within the existing fish ladder footprint. This will minimize the impact to undisturbed areas of the riverbed and substrate. Before work begins, fish passage into the fish ladder will be blocked and staff will ensure no aquatic species remain in the work area. Work within the fish ladder area will be limited to July 15 to October 31 to avoid any potential impacts to sensitive species.

9. Types of Impact

WDFW and the Nisqually Tribe are committed to the success of the Project. This Project is an important part of the Salmon Recovery Plan and the major project elements have been planned within an existing hydro dam area.

There will be no direct impacts below the OHWM, as the fish trap lift is being constructed within the existing footprint of the Centralia Hydro Dam fish ladder. Impacts to the floodplain and Wetland A buffer will be minimal, as the fish trap is being constructed within the existing fish ladder footprint. Additional ground disturbance within both the floodplain and wetland buffer will occur to construct the sampling facility; however, this is being constructed within an area that consists of existing impervious surface. Additional impacts to the wetland buffer will result from the construction of the 10 ft x 20 ft gravel pad, which will result in 200 square feet of new impervious surface within the wetland buffer. This gravel pad is located outside of the 100-yr FEMA floodplain as depicted in county and FEMA maps. Therefore, it is not being considered an impact to floodplain habitat. Any wetland buffer impacts that fall outside of the 100-yr floodplain will be addressed under a separate mitigation plan if they are required as part of the county permitting process.

Other alternatives were evaluated during the design process in an attempt to avoid and minimize project impacts. These alternatives had larger impacts and would not have met the needs of the project. No trees or other valuable riparian vegetation will be removed as part of this project. A no-net rise certification has been completed by a Professional Engineer indicating that no rise in flood levels will result from the construction of the proposed Project, so no loss of flood storage will occur. A potential loss of refugia could occur; however, the refugia provided by the existing impervious surface near the dam is minimal. The Project has been designed in a way to minimize impacts wherever possible, as the sampling facility is currently designed as an open-walled structure to avoid trapping floodwaters, sediment, or stranding fish. Additionally, the fish trap itself is proposed within the existing fish ladder for the hydro dam. Proper BMPs will be implemented during Project construction to ensure increased turbidity in the Nisqually River and associated indirect impacts are minimized to the greatest extent possible. The Puget Sound region has a high level of development. The sampling facility structures and the site have been designed to have the smallest footprint and impact possible. Therefore, the cumulative impact from the proposed project on the region as a whole will be minimal due to the large amount of development already existing and the locating of structures within previously developed areas.

10. Effects Determination

Table 3 and the following paragraphs outline the effects determinations for the proposed Project.

Table 3: Summary of ESA Listed Species Effects Determinations

Common Name	Scientific Name	Effects Determination	Critical Habitat Present	Habitat Determination
Puget Sound ESU Chinook Salmon	*Oncorhynchus tshawytscha*	NLAA*	Critical Habitat Present per the FPRA, Essential Fish Habitat Present per NMFS EFH Mapper	NLAA
Puget Sound DPS Steelhead	*Oncorhynchus mykiss*	NLAA	Critical Habitat Present per the FPRA	NLAA
Coho Salmon	*Oncorhynchus kisutch*	NLAA	Essential Fish Habitat Present per NMFS EFH Mapper	NLAA
Puget Sound Pink Salmon	*Oncorhynchus gorbuscha*	NLAA	Essential Fish Habitat Present per NMFS EFH Mapper	NLAA
Bull Trout/Dolly Varden	*Salvelinus confluentus/ S. malma*	NLAA	Critical Habitat Present per IPaC	NLAA

Table 3: Summary of ESA Listed Species Effects Determinations				
Common Name	**Scientific Name**	**Effects Determination**	**Critical Habitat Present**	**Habitat Determination**
Olympia, Tenino, and Yelm Pocket Gophers	*Thomomys mazama pugetensis, Thomomys mazama tumuli, Thomomys mazama yelmensis*	NE	Location of Critical Habitat is Not Available per IPaC	N/A

*NLAA = May Affect, Not Likely to Adversely Effect

Puget Sound ESU Chinook Salmon (*Oncorhynchus tshawytscha*) – Threatened; Puget Sound DPS Steelhead (*Oncorhynchus mykiss*) - Threatened; Coho Salmon (*Oncorhynchus kisutch*); Puget Sound Pink Salmon (*Oncorhynchus gorbuscha*)

The proposed project does not have any in-water work, as the fish trap is being constructed within the existing fish ladder footprint. The fish ladder will be blocked and defished before any construction activities begin. The only ground disturbance within the floodplain is due to the sampling facility and associated structures which will occur in existing impervious and graveled/maintained upland areas. Construction activities will have a short duration and appropriate BMPs will be utilized to ensure sediment does not enter the waterway. Because this project will have no in-water work, and because the cumulative and indirect impacts are considered negligible relative to existing impacts within the Puget Sound region, we have determined this project ***May Affect, Not Likely to Adversely Affect*** Puget Sound ESU Chinook Salmon, Puget Sound DPS Steelhead, Coho Salmon, or Puget Sound Pink Salmon.

Essential Fish Habitat determination

Puget Sound ESU Chinook Salmon, Puget Sound Steelhead, Coho Salmon, and Puget Sound Pink Salmon are listed as having critical habitat present per the FRPA and/or essential fish habitat present per the NMFS EFH Mapper. This project does not involve any in-water work and will not have any direct effects to these salmonid species. This project may have indirect effects on water quality, but those effects are discountable with proper BMPs for erosion control and stormwater management. This project ***May Affect, Not Likely to Adversely Affect*** EFH for Puget Sound ESU Chinook Salmon, Puget Sound Steelhead, Coho Salmon, and Puget Sound Pink Salmon.

Bull Trout/Dolly Varden (*Salvelinus confluentus/S. malma*)- Threatened

The proposed project does not have any in-water work, as the fish trap is being constructed within the existing fish ladder footprint. The fish ladder will be blocked and defished before any construction activities begin. The only ground disturbance within the floodplain is due to the sampling facility and associated structures which will occur in existing impervious and graveled/maintained upland areas. Construction activities will have a short duration and appropriate BMPs will be utilized to ensure sediment

does not enter the waterway. Because this project will have no in-water work, and because the cumulative and indirect impacts are considered minimal relative to existing impacts within the Puget Sound region, we have determined this project ***May Affect, Not Likely to Adversely Affect*** Bull Trout or critical habitat as designated by IPaC.

Olympia, Tenino, and Yelm Pocket Gophers (*Thomomys mazama pugetensis, Thomomys mazama tumuli, Thomomys mazama yelmensis*) - Threatened

Soils supporting Olympia, Tenino, and Yelm Pocket Gophers are not present within the Project area. Therefore, we have determined this project will have ***No Effect*** on these pocket gophers or critical habitat as designated by IPaC.

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Appendix A

Drawing set