VAN LITH MOORING BUOY

BIOLOGICAL ASSESSMENT

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1 INTRODUCTION AND SPECIES OF CONCERN

Miel Van Lith ("Applicant") proposes to install one (1) mooring buoy on the Columbia River in downriver of Malaga, WA. In connection with the proposed project, the Applicant has submitted an application for a U.S. Army Corps of Engineers (Corps) permit for work in the Columbia River. The Endangered Species Act (ESA) requires Federal agencies (in this case the Corps) to ensure that they do not authorize, fund, or carry out actions that are likely to jeopardize the continued existence of endangered or threatened species. This Biological Assessment (BA) has been prepared to assist the Corps in its review of the Applicant's permit application and in conducting required consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS).

Species listed under the ESA that may be present in the vicinity of the project site include Upper Columbia River spring-run Chinook salmon (*Oncorhynchus tshawytscha* – endangered), Upper Columbia River steelhead (*O. mykiss* – threatened), Columbia River bull trout (*Salvelinus confluentus* – threatened), and Ute ladies' -tresses (*Spiranthes diluvialis* – threatened). In addition, the project is located within areas designated as Upper Columbia River steelhead critical habitat.

Based on conversations with the Corps, it has been determined that all new residential overwater structures on the upper Columbia River would result in an effects call of "*may affect, likely to adversely affect*" to affected ESA-listed species and critical habitats. However, USFWS has not made this determination. Thus, the conclusions of this BA are as follows:

<u>Species</u>

- Upper Columbia River spring-run Chinook salmon – ***may affect, likely to adversely affect***
- Upper Columbia River steelhead – ***may affect, likely to adversely affect***
- Columbia River bull trout – ***may affect, not likely to adversely affect***
- Ute ladies'-tresses – ***no effect***

<u>Critical Habitat</u>

- Upper Columbia River spring-run Chinook salmon critical habitat – ***may affect, likely to adversely affect***
- Upper Columbia River steelhead critical habitat – ***may affect, likely to adversely affect***
- Columbia River bull trout critical habitat – ***may affect, not likely to adversely affect***

2 PROJECT DESCRIPTION

2.1 BACKGROUND

The purpose of this project is to install one (1) mooring buoy on the Columbia River. The proposed buoy would provide a safe, long term moorage opportunity to keep the boat on the property. The buoy would be installed on the Grant County PUD's property (Parcel 212228120050), which is immediately waterward of the applicant's property, parcel # 212229535105, at 7667 Tarpiscan Rd, Chelan County, WA (Sheet 1). The project would occur on the reservoir created by Wanapum Dam. Water levels in the lake vary depending on seasonal runoff and hydropower operations.

2.2 PROPOSED PROJECT

2.2.1 Proposed Project and Construction Description

The applicant proposes to install a mooring buoy on the Columbia River and conduct maintenance activities and the restoration on the existing dirt/gravel access trail within the riparian buffer (Sheets 1-5). The mooring buoy would consist of a buoy, a stainless-steel chain, and an anchor. The anchor would be either a helical screw anchor, duckbill/sting ray/manta ray anchor, or a danforth anchor depending on substrate conditions. This type of anchor would be installed by a diver. If substrate conditions prohibit in-ground type anchors, a concrete anchor would be used. A concrete anchor would be lowered from a barge with a winch. The concrete anchor would be square, approximately 0.8 ft tall, and 4 ft by 4 ft, for a 5:1 ratio of width to height. A ½ inch chain would connect the anchor and the buoy. A float would be attached to the chain to ensure that it does not rest on the bottom substrate in low water conditions. The buoy would be a closed cell EPS encased polyethylene buoy, 18 inches in diameter. The buoy would be located immediately waterward of the portion of the access trail where the trail first reaches the OHWM. This will place the mooring buoy approximately waterward of the existing single family residence on the applicant' property. Additionally, the mooring buoy will be located immediately upriver of the existing metal structure located immediately waterward of the OHWM. The mooring buoy will be installed approximately 50 ft waterward of the OHWM of the Columbia River at a water depth of approximately 20 ft.

To offset impacts related to the mooring buoy, a 248 sq ft mitigation planting area would be installed immediately downriver of the proposed mooring buoy. As mentioned above, this represents a 1.24:1 mitigation ratio for the approximate area of the buoy/anchor/boats. The existing vegetation within the mitigation planting area consists of blackberry, which will be removed prior to planting. Native species to be planted include water birch (*Betula occidentalis*), red osier dogwood (*Cornus sericea*), and coyote willow (*Salix exigua*). The mitigation planting would be installed at or near the OHWM. This planting area would be located along the community trail adjacent to the OHWM within a gradually sloped portion of the shoreline. The trees would be planted at a spacing of 10 ft on-center and the shrubs would be planted at a spacing of 3-5 ft on-center. The planting plan would require 1 tree and 8 shrubs per 100 sq ft of mitigation planting area, which will result in the installation of 2 trees and 22 shrub.

The existing access trail is approximately 6-8 ft wide and extends from the OHWM up the steep slope to the top of the bank. The existing access trail is approximatley 260 ft long (~185 ft long within the riparian buffer). The proposed project would result in minor maintenance to the existing trail and the restoration of the remainder of the trail. The PUD has indicated that the trail is currently being utilized by vehicles and that this use need to cease. In order to facilitate that, the applicant is proposing to maintain approximatley 3 ft of the trail and restore the remainder of the trail. The proposed maintenance would entail the placement of gravel on the landward three (3) feet of the trail. This will entail placing approximately 4 cyds of gravel on the trail bed and will not result in the excavation or grading of the existing slopes. Likewise, the proposed project would not result in the removal of any native vegetation. The remainder of the trail footprint will be restored by installing native shrub steppe vegetation and the seeding of the area with native grasses and wildflower species. Overall, gravel will be placed over approximatley 740 sq ft within the riparian buffer (on the existing access trail) and the restoration would result in planting over approximately 740 sq ft. The final element of the proposed project would be the installation of three wood/rock steps immediately landward of the OHWM in order to provide safe access to the river. The steps will be installed on grade and would require the removal of less than 0.5 cyds. The steps would occur completed landward of the OHWM.

There will be no impacts associates with the maintenance of the trail due to the fact that it is an existing/historic trail that is currently disturbed, and vegetation consists of upland grasses and weedy species. The restoration of the waterward portion of the trail will result in the installation of native shrub steppe vegetation within the buffer where no vegetation currently exists. This will result in the overall increase in habitat functions and values within the riparian buffer. See Section 8 for a discussion of avoidance/minimization measures.

Overall the proposed project will result in the installation of 248 sq ft of native riparian and ~740 sq ft of shrub steppe vegetation within the riparian buffer. This will result in the net increase in habitat functions and values at the site and will actually restore the riparian buffer to a more native state (natural character). The proposed project will result in an overall increase in habitat functions and values.

Prior to the site visit, the applicant cleared a portion of the access trail, upriver of the existing well head. This clearing resulted in the mowing of the existing reed canarygrass, poison oak, and coyote willow. At the time of the site visit, this vegetation had completely reestablished, and the area of clearing was barely noticeable. The vegetation had rapidly restored itself. The maintenance of the trail and installation of steps will eliminate the use of the shoreline upriver of the proposed mooring buoy. This will ensure that the applicant will not access the shoreline upriver of the mooring buoy and will not alter or disturb that portion of the shoreline. Because the vegetation has fully restored, there is no need for additional plantings to ensure the vegetation is restored. Additionally, as part of this approval the applicant will no longer dumping grass clipping, tree/shrub trimming, or other yard waste will be dumped on PUD property.

2.2.2 Avoidance/Minimization Measures

Impacts related to the mooring buoy installation have been minimized to the extent possible. The use of a mooring buoy itself is a minimization measure, as opposed to a dock or boatlift. Potential impacts to fish and aquatic life would be sufficiently minimized by the conformance with the conservation measures in the USACE Mooring Buoy SPIF and subsequent Biological Opinions. Specifically, to avoid and minimize impacts, the following avoidance/minimization measures would be met:

- The buoy would be installed within the in-water work window to minimize potential effects on migrating juvenile salmonids.
- The buoy will be placed in ~20 ft of water relative to OHWM, and thus will not affect juvenile salmonids which are more shoreline-oriented.
- The buoy will be installed so that the anchor lines do not drag, and the attached vessel does not ground out at low water.
- No piles are proposed.
- If possible, the buoy would be anchored with an in-ground type anchor such as a helix anchor, duckbill anchor, or danforth anchor.
- A concrete block anchor would only be used if excessively rocky substrate prevents in-ground anchors.
- If a concrete block is used, the block would conform to a 5:1 width:height ratio.
- The buoy would be 3 ft diameter or less.
- Flotation will be completely contained within the buoy to prevent break-up.
- Extreme care will be taken to prevent spills or debris from entering the water during installation.

The access to the river does not extend below OHWM and will have no adverse impacts to the Columbia River. The proposed trail location utilizes existing prominent trails. The proposed location of the access trail is upland grasses and weedy species and would have no impacts on native vegetation.

Minimization measures include:

- The trail size has been designed to the minimum necessary to provide safe foot access to the shoreline while maintaining a safe, walkable slope.
- Soil disturbance would be kept to the minimum necessary to construct the trail.
- The proposed project would restore a portion of the trail and eliminate vehicular access on the trail.

2.2.3 Proposed Mitigation Plan

The project and mitigation planting was designed/located to avoid and minimize aquatic and riparian impacts to the extent possible. To offset impacts related to the mooring buoy, a 248 sq ft mitigation planting area would be installed. As mentioned above, this represents a 1.24:1 mitigation ratio for the approximate area of the buoy/anchor/boats. Native species to be planted include water birch (*Betula occidentalis*), red osier dogwood (*Cornus sericea*), and coyote willow (*Salix exigua*). The mitigation planting would be installed at or near the OHWM

immediately downriver of the proposed launch. This planting area would be located along the community trail adjacent to the OHWM within a gradually sloped portion of the shoreline. The trees would be planted at a spacing of 10 ft on-center and the shrubs would be planted at a spacing of 3-5 ft on-center. The planting plan would require 1 tree and 8 shrubs per 100 sq ft of mitigation planting area, which will result in the installation of 2 trees and 22 shrub.

To ensure the success of the planting areas, the mitigation planting area will be monitored for a five-year period to determine percent survival. Monitoring of shrubs will occur by a count to determine percent survival. Per the USACE permit, 100% survival is required after year 1, and 80% survival is required for years 2-5. Additionally, cover of noxious weeds within the planting area must be less than 20%. A Riparian Restoration Monitoring Report will be completed and submitted to the USACE and Grant County PUD after years 1, 3 and 5 following completion of planting and seeding. The applicant will be responsible for ensuring that the Riparian Restoration Monitoring Reports are submitted on schedule and that success measures are met.

The installation of native riparian vegetation would not only provide fish and wildlife habitat on the subject property but would also result in an increase of organic debris and prey species into the riparian zone of and river. This would enhance both the aquatic habitat on the subject property as well as the properties downriver of the property. The riparian planting installed to mitigate for the potential impacts of the project will be preserved and maintained for as long as the authorized project remains in place.

To proposed maintenance of the access trail will not require an additional compensatory mitigation as the access trail already existing and was likely installed as part of the well head/pumphouse. This trail has been routinely accessed to get vehicles down to the pumphouse. The proposed maintenance will not result in any adverse impacts or a change in use and will not require and mitigation. The proposed project will also result in the restoration of the remainder of the access trail (footprint of the trail outside of the 3 ft that will be maintained). The restoration will be conducted to help eliminate the vehicular use of the access trail, which is a requirement of the PUD. The restoration of the access trail will entail the installation of wood's rose (*Rosa woodsii*), gray rabbitbrush (*Chrysothamnus nauseosus*), and bitterbrush (*Purshia tridentata*). The area will also be seeded with a native seed and wildflower mixture. Neither of these actions will result in adverse impacts to native vegetation. Since this planting is a restoration action and not a mitigation action, the area will not be required to meet the same survival standard. The survival of the restoration planting will be 80% over the 5 year monitoring effort.

2.2.4 Mitigation As-Built Report

Upon completion of the mitigation plantings, an as-built mitigation report would be sent to the Corps and NMFS to demonstrate that the mitigation has been completed. The report would include the Corps permit number and NMFS tracking number, a description of the type of mitigation completed, as-built drawings and photographs, the location (street address, latitude/longitude) and size of the mitigation planting areas, and the species and quantity of the mitigation plantings. The report would be submitted by the first January 31 following permit issuance.

2.2.5 Mitigation Monitoring and Performance Standards

To ensure the success of the planting area, a five-year monitoring plan will be conducted to determine percent survival. 100 percent survival will be required for the first two years and 80 percent survival from years three through five. Individual plants that do not survive must be replaced with appropriate species (trees for trees and shrubs for shrubs) approved by NMFS. Annual monitoring reports would be submitted to the Corps and to NMFS each year of the 5-year monitoring program. Reports would be due January 31, beginning with the year following mitigation installation. The report would include the Corps permit number and NMFS tracking number, the location of the mitigation site, the percent survival for both trees and shrubs, and quantity and species of any required replacement plants.

To ensure the mitigation plantings provide habitat benefits for as long as the buoy remains, the applicant would attach to the property deed a copy of the mitigation planting plan approved by the Corps and NMFS. The applicant would provide proof to the Corps that the mitigation information has been recorded on the property deed within 60 days of permit issuance.

Non-compliance with the approved mitigation plan (installation or survival requirements) may result in an increase in the required amount of riparian planting by up to 25 percent.

2.3 BUOY CONSTRUCTION REPORT

Upon installation of the mooring buoy, a construction report would be sent to NMFS and the Corps. The report would include the Corps permit number and NMFS tracking number, the area of the in-water and riparian structure, the minimum lateral distance from OHWM to the buoy, and the minimum water depth at the buoy relative to the OHWM. The report would be submitted by the first January 31 following permit issuance. If the buoy is not installed by the first January 31 following permit issuance, a report would be submitted to NMFS and the Corps stating that the buoy has not been installed by January 31, as well as every subsequent January 31 that the buoy remains un-installed until the expiration date of the permit.

2.4 REPORT SUBMITTALS

All required as-built and monitoring reports will be submitted to:

- NMFS, Washington State Habitat Office, ATTN:OWS Team, 304 South Water Street, Suite 201, Ellensburg, WA. 98926.
- USACE, Seattle District, Regulatory Branch, P.O. Box 3755, Seattle, WA. 98124-3755.

2.5 PROJECT TIMING

The project would begin as soon as possible after permits are received. The proposed project will take approximately 1 day for installation. Best Management Practices (BMPs) would be implemented to minimize the potential effects on aquatic habitats or species. All in-water work would be timed to avoid the annual outmigration of juvenile salmonids. USFWS, NOAA Fisheries, and WDFW have set closure periods during which in-water work cannot be

conducted. Based on guidance from the Corps, the expected work window is July 16 through February 28 on the Columbia River. The Applicant will comply with the work closures determined during project review. All in-water work proposed for this project will be performed using standard BMPs (see Section 7.3).

3 DESCRIPTION OF THE PROJECT AREA

3.1 HABITAT ZONES

For the purposes of this BA, habitat is divided into upland and aquatic habitat. These habitats are divided by the OHWM, which is field-located based on the definition given in the Shoreline Management Act of 1971 (RCW 90.58.030):

> *"that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation…"*

Work would occur in the upland and aquatic habitat; however, only the portion of the work occurring within the aquatic habitat (i.e., the buoy) would be addressed in this BA.

3.2 DEFINITION OF THE PROJECT AREA

For the purpose of this analysis, the "project Area" includes all locations where construction would occur. For the purposes of this BA the Project Area is primarily aquatic habitat, covering approximately 425 sq ft (125 sq ft for buoy and ~300 sq ft for barge). Upland habitat areas which may be used for the access, storage, and/or staging of construction materials represent habitat which has been significantly altered as part of the historic use of the property (existing access trail and wellhead).

3.3 DEFINITION OF THE ACTION AREA

The "Action Area" encompasses the project Area as well as all habitats that could be directly or indirectly affected by the proposed project. To determine the boundaries of the Action Area, consideration was given to the potential reach of mechanisms that may lead to impacts on the species of concern. The project element that has the potential for the most far-reaching impacts would be installation of the buoy. For this reason, the Action Area is identical to the project Area (~425 sq ft).

For Ute ladies'-tresses, potential impacts of the project would be limited to the direct effects of construction in the upland. Therefore, for this species, the Action Area is coincident with the upland portion of the project Area. The Ute ladies'-tresses has not been identified as occurring in or near the Action Area, and there is no suitable habitat for this species in the area.

3.4 ENVIRONMENTAL BASELINE CONDITIONS

The property is located on the west shore of the Columbia River immediately waterward of 7667 Tarpiscan Rd, Malaga, WA, Chelan County 98828 (Sheets 1 and 2). The buoy will be installed on the Grant County PUD's property (Parcel 212228120050) that is immediately waterward of the applicant's parcel (212229535105), Latitude and Longitude 47.288 N / -120.091 W; Township 21 N, Range 22 E., Section 29.

The property consists of a steeply sloped shoreline (PUD property). Above the top of the bank the property flattens off.

Upland

The proposed project will occur on the Grant County PUD property located waterward of the applicant's property. The applicant's property is located above the top of the bank and the majority of the vegetation consists of landscaping, farming and shrub steppe vegetation. The proposed project would not impact any of this vegetation as the project would occur on the PUD property below the top of the bank. The top of the bank is located a minimum of 65 ft landward of the OHWM and it provides little if any habitat functions and values. The vegetation on the PUD property varies significantly based on proximity to the river and slope. The majority of the shoreline is steeply sloped from the OHWM landward to the top of the bank. There is a flat portion of the shoreline that is a result of the historic use of the metal structure in the river and the well head. The use of these resulted in the development of a dirt/gravel access trail and extends beyond the well head. On this access trail, the vegetation is dominated by reed canarygrass, willow, red osier dogwood, poison oak, and blackberry. Hydrology on this flat area is from the river and overflow/leakage from the well head. The width of this vegetation extend up to 25 ft from the OHWM; however, this only occurs within the footprint of the access trail. This portion of the shoreline is providing a moderate to high level of habitat functions and values due to the dense vegetation and the limited nature of this type of habitat. Along the remainder of the shoreline there is a narrower strip of vegetation (same species) that only extends 2-8 ft landward of the OHWM. This is based on the steep slope of the shoreline. Landward of this vegetation that majority of the shoreline (remainder of the PUD property) consists of shrub steppe vegetation. Species are dominated by big sagebrush, bitterbrush, rabbitbrush, and upland grasses and weedy species. Additionally, there are areas a bed rock upriver of the proposed project location. The one exception to this is the existing dirt/gravel access trail. The trail has been historically used by vehicle to access the well head and metal structure. The trail is approximately 6-8 ft wide, and the vegetation consists of upland grasses and weedy species that are routinely mowed and maintained. The use of the access trail by the public maintains the weedy species.

Based on the Chelan County SMP, there is a 100 ft riparian buffer on the subject property.

Aquatic

The aquatic habitat at the site is characterized by a moderate to steep slope (5-10H:1V) from OHWM out past the buoy location. The substrate is small to large cobble. The site receives low boating use due to the lack of private ownership of the shoreline in the adjacent areas. The majority of the boating occurs downriver of the project area (near Crescent Bar). There are no private docks within the surrounding areas since the Grant County PUD do not allow private dock facilities on this stretch of river.

For these reasons, the aquatic area provides a moderate level of habitat.

3.4.1 Existing Boating Activity and Site Use

The parcel is located within a portion of the river with no private ownership of the river and no overwater structures. The site is subject to low levels of recreational boating activity. The existing boat activity consists of public use of the river and use by the public leaving from Crescent Bar. The use occurs primarily between the middle of June through the middle of September; however, some fishing occurs outside of this window. The use during the summer months is primarily fishing, water skiing and pleasure boating. This use currently exists on the subject property; however, instead of mooring the boat at a buoy they use the boat's anchor or pull the boat onto the beach. Boats and watercrafts are kept on site for short periods of time and removed for fueling or maintenance. Boating activity occurs primarily in waters deeper than 25 ft as the shallow areas within the river are hazards to navigation. These areas are more frequent along the sides of the reservoir and in shallower water. The primary boating use of the entire reservoir occurs towards the center of the river, in deeper water (greater than 25 ft).

The installation of the proposed buoy is not expected to significantly increase the recreational activity on the reservoir, as regardless of the buoy the applicants will utilize the river and moor the boat on the property.

3.5 DEFINITION OF THE REACH

Based on recent guidance from the Corps, a project in the Upper Columbia River must include baseline information for the "Reach" in which the project is to occur. Since the Corps has not provided specific guidance for an individual mooring buoy, the Reach for a buoy will be utilized. For a buoy, the Reach is defined as a distance of 200 feet upstream and downstream of the proposed buoy on the side of the river on which the buoy is proposed. As the project's direct and indirect effects are limited to the Action Area described above and would not encompass the entire Reach, per discussions with NMFS and the Corps, the Action Area would not include the entire Reach. The baseline conditions of the entire Reach are described below.

3.5.1 Waterfront Parcels

One (1) parcels are present in the Reach, which is a large Grant County PUD parcel (publically owned). Therefore, no inwater / overwater structures are currently installed, and it is not likely that the PUD will allow for new overwater structures. All development below the OHWM would consists of mooring buoys.

3.5.2 Existing Inwater/Overwater Structures

As mentioned above, there are no overwater structures within the Reach. There is metal pipes immediately below the OHWM that may have been part of historic moorage on the property; however, there is no overwater shading or structure remaining.

Figure 1. Van Lith mooring buoy reach

3.5.3 Reach Survey Date and Methods

This Reach was surveyed using the most recent aerial photographs available, such as the Chelan County parcel map (Chelan County 2015), Google Maps – 2018 (Google 2018), and WA Department of Ecology Coastal Atlas oblique aerial photos – 2017 (WDOE 2015). The Reach was also surveyed by site visits in May 2021.

3.5.4 Existing Riparian Conditions

The existing riparian conditions within the Reach are identical to the conditions on the subject property, which are described in detail in Section 3.4 above.

3.5.5 Nearshore Bathymetry

Nearshore bathymetry is similar throughout the reach, characterized by a moderate slope (~5-10H:1V) out to the buoy location (50 ft) and beyond.

3.5.6 Nearshore Substrate

The nearshore substrates are similar for the entire Reach. Substrate between the OHWM and the proposed buoy location (55 feet from the OHWM) consist of cobbles and sand with some fine silt. These sandy/silty substrates extend from shore out to and beyond a water depth of 15 ft below the OHWM.

3.5.7 Aquatic Vegetation

Aquatic vegetation does not appear to be present within the Reach.

4 DESCRIPTION OF SPECIES AND HABITAT USE

The species of concern associated with the Action Area are Upper Columbia River spring-run Chinook salmon, Upper Columbia River steelhead, Columbia River bull trout, and Ute ladies'-tresses.

4.1 UPPER COLUMBIA RIVER SPRING-RUN CHINOOK SALMON (*Oncorhynchus tshawytscha*)

The Upper Columbia River spring-run Chinook salmon ESU includes all naturally spawned populations of Chinook salmon in all river reaches accessible to Chinook in Columbia River tributaries upstream of the Rock Island Dam and downstream of Chief Joseph Dam in Washington (excluding the Okanogan River, which are considered as part of the Upper Columbia summer- and fall-run ESU), the Columbia River from a straight line connecting the west end of the Clatsop jetty (south jetty, Oregon side) and the west end of the Peacock jetty (north jetty, Washington side) upstream to Chief Joseph Dam in Washington, as well as six artificial propagation programs: the Twisp River, Chewuch River, Methow Composite, Winthrop NFH, Chiwawa River, and White River spring-run Chinook hatchery programs (NOAA 2005). The nearest Chinook spawning stream to the Action Area is the Entiat River, which is approximately 21 miles downstream of the Action Area.

Chinook salmon are the largest of the Pacific salmon. Two distinct races of Chinook salmon, an "ocean-type" and a "stream-type", are recognized. Juvenile spring Chinook in the Upper Columbia River ESU generally exhibit a stream-type life history pattern, rearing in fresh water for about one year before migrating to the ocean (Corps 2000). The spring-run is made up of several stocks that spawn in headwater tributaries of the Columbia River, including the Wenatchee, Entiat and Methow Rivers. Hatchery populations are also produced from the Chiwawa River, Methow River, Twisp River, Chewuch River, White River and Nason Creek.

Upper Columbia River spring Chinook salmon juveniles generally emerge from the gravel in March and April. After emergence, the juvenile fish move into shallow water to rear, and many are displaced downstream by high flows in spring and summer. Spring Chinook salmon rearing in the colder upper tributaries may migrate in the fall into overwintering habitats in the larger tributaries. Yearling spring Chinook salmon migrate past the Action Area on their way to the ocean from mid-April to early July, with the peak migration occurring in mid- to late-May (Fish Passage Center 1987). Juvenile spring Chinook migrate actively through this portion of the Columbia River and are not strongly shoreline-oriented during this period. Therefore, it is likely that most juvenile spring Chinook salmon moving through the area remain in the main river channel away from the project Area.

Adult spring Chinook salmon enter the Columbia River from March through May, with most adults passing through the Action Area from mid-April to mid-June (Chelan County PUD 1998a, 1998b). Spawning of spring Chinook salmon occurs in the upper reaches of the tributaries from late July through September. No spawning occurs in or near the Action Area.

Critical habitat for Upper Columbia River spring-run Chinook salmon has been designated (NOAA 2005). Section 6 includes a description of Chinook critical habitat and potential effects of the project on critical habitat.

4.2 UPPER COLUMBIA RIVER STEELHEAD TROUT (*Oncorhynchus mykiss*)

The Upper Columbia River steelhead DPS includes all naturally spawned populations of steelhead in streams in the Columbia River Basin upstream from the Yakima River, Washington, to the U.S.-Canada border. Six artificial propagation programs are considered part of the DPS: the Wenatchee River, Wells Hatchery (in the Methow and Okanogan Rivers), Winthrop NFH, Omak Creek, and the Ringold steelhead hatchery programs (NOAA 2006). The nearest steelhead spawning stream to the Action Area is the Chelan River, which is approximately 2 miles downstream of the project Area.

Steelhead trout exhibit one of the most complex life histories of the salmonid species. Both anadromous (steelhead trout) and resident (rainbow or redband trout) forms occur in the Columbia River. Steelhead trout reside in the marine environment for two to three years before returning to their natal stream to spawn as primarily 4- or 5-year-old fish. Steelhead may spawn more than once before they die.

Steelhead trout can be divided into two reproductive ecotypes, termed "stream-maturing" ("summer run") and "ocean-maturing" ("winter run"). Stream-maturing steelhead trout enter fresh water in a sexually immature state and require from several months to a year to mature and spawn. Ocean-maturing steelhead trout enter fresh water in a mature condition and spawn shortly after entering their natal stream. Steelhead trout in the Columbia River basin are essentially all stream-maturing fish (Corps 2000).

Upper Columbia River steelhead trout juveniles generally emerge from the gravel from July through September. After emergence, juveniles move downstream into overwintering habitats. Most steelhead trout juveniles rear in fresh water for two to three years, although the duration of freshwater residence can range from one to seven years. Approximately 90 percent of the wild steelhead trout juveniles in samples taken at the Rock Island and Rocky Reach Dams (downstream of the project Area) were two- and three-winter residents (Chelan County PUD 1998a). Wild steelhead trout juveniles migrate through the Columbia River during the spring, passing McNary Dam from April to early July, with peak numbers in early June (Fish Passage Center 1987). Juvenile steelhead trout in the mid-Columbia are actively migrating (averaging 32 km/day), and thus the residence time is short (Chelan County PUD 1998a). Migrating steelhead trout smolts typically remain in mid-channel where water velocities are highest.

The majority of adult summer steelhead trout pass Rocky Reach Dam from July to mid-October and spawn the following spring or summer. Some adult steelhead overwinter in the Columbia River, passing Rocky Reach Dam from May through June (Columbia Basin Research 2008).

The Action Area is not used by steelhead trout for spawning and rearing generally occurs within the tributaries. As mentioned above, steelhead use the Action Area as a corridor for juvenile and adult migration. Similar to juvenile spring Chinook salmon, juvenile steelhead

trout migrate actively past the Action Area, and the majority of migrating juveniles likely remain in the main river channel, offshore from the Action Area. As noted above, some adult steelhead overwinter in the Columbia River, and it is possible that adult fish could be present in the Action Area during that time.

Critical habitat for Upper Columbia River steelhead trout has been designated (NOAA 2005), and a description of steelhead trout critical habitat and potential effects of the project on critical habitat are included in Section 6.

4.3 COLUMBIA RIVER BULL TROUT (*SALVELINUS CONFLUENTUS*)

The Columbia River DPS encompasses the entire Columbia River basin and its tributaries, excluding the Jarbidge River, Nevada. Although two distinct clades have been identified in the Columbia River basin (Upper and Lower Columbia River clades) based on genetic diversity patterns, a discrete geographical boundary between the two clades was not documented. The Columbia River DPS is significant because the overall range of the species would be substantially reduced if this discrete population were lost. The nearest stream supporting bull trout spawning is the Entiat/Mad Rivers, approximately 21 miles downstream.

Bull trout are members of the char subgroup of the salmon family. The species exhibits both migratory and non-migratory life histories throughout much of its current range (Rieman and McIntyre 1993). The adfluvial form migrates between lakes and streams, the fluvial form migrates within river systems, and the resident form is non-migratory. Resident and migratory forms may be found together, and it is suspected that bull trout give rise to offspring that can exhibit either resident or migratory behavior (Rieman and McIntyre 1993).

Bull trout spawn when they reach maturity, between 4 and 7 years of age. They typically spawn from August to November as water temperatures drop, although spawning migrations may begin as early as April (Corps 2000). Bull trout require clean gravel or cobble substrate and cold water for spawning. Spawning generally will occur only after water temperatures drop below 8 to 10°C (Kraemer 1994). The period from egg deposition to emergence may be up to 220 days, making embryos vulnerable to temperature fluctuations and sedimentation. Fry emerge in April and May. Juvenile bull trout prey on terrestrial and aquatic insects; as they increase in size, bull trout also feed on other fish. Adult bull trout are primarily piscivorous and are known to prey on a variety of fish species (Corps 2000).

The distribution of bull trout in fresh water is strongly influenced by water temperature (Ratliff 1992; Rieman and McIntyre 1993; Buchanan and Gregory 1997) and they are associated with the coldest stream reaches in watersheds (Lee et al. 1997). Bull trout are widespread throughout the tributaries of the Columbia River, including its headwaters in Montana and Canada (Corps 2000). It is estimated that the Columbia River bull trout occurs in 45 percent of its historical range.

Subpopulations of bull trout within the mid-Columbia basin occur in the Yakima, Wenatchee, Entiat and Methow Rivers. The Action Area is used as a corridor for adult and juvenile bull trout migration, and it is possible that adult fluvial bull trout use habitats in the Action Area.

The previous bull trout critical habitat designation was recently expanded to include the mainstem Columbia River and tributaries (effective November 17, 2010). The Action Area would be within the Mainstem Upper Columbia River Unit, immediately downstream of Unit 10: Upper Columbia River Basins, Chelan River Sub-Unit. The revised designation also includes revised primary constituent elements (PCEs). Bull trout critical habitat is addressed in Section 6.

4.4 UTE LADIES'-TRESSES

Ute ladies'-tresses is a perennial, terrestrial orchid with stems 8 to 20 inches tall that arise from tuberous roots. It flowers in August through early September. The inflorescence consists of multiple small, white or ivory flowers clustered at the top of the stem. Its range encompasses eight Western states, including Washington, where it was collected in 1997 from a single site in Okanogan County. This known site is in a periodically flooded alkaline flat (moist meadow) adjacent to Ponderosa pine/Douglas fir woodlands and sagebrush steppe. According to the Washington Natural Heritage Program, the species is restricted to calcareous, temporarily inundated wet meadows and channels and swales where there is stable subsurface moisture.

Wetland habitat suitable for Ute ladies'-tresses does not occur within the Action Area. In general, the riparian and wetland habitats that may support this species in other areas have been affected by stream channelization, water diversions, and other watershed and stream alterations. The species has not been identified on the project site.

5 EFFECTS OF THE PROJECT

5.1 INTRODUCTION

This section presents the direct effects, indirect effects, and cumulative effects of the proposed project within the Action Area and describes interrelated and interdependent actions that may lead to effects on the species of concern. The project's effects on threatened and endangered species are described in this section, whereas the potential effects on steelhead trout critical habitat are described in Section 6. Due to the similar use of habitat in the Action Area by all listed salmonids, and similar effects of the project on all listed salmonids, effects of the project are assessed for all salmonid species together. Where different salmonid species may be affected differently, this will be noted in each section.

5.2 DIRECT AND INDIRECT EFFECTS ON SALMONIDS

Project construction is not expected to adversely affect juvenile salmonids, as the project would be conducted during the established in-water work season approved by the WDFW, Corps, NMFS, and USFWS (anticipated to be the period between July 16 and February 28). This would ensure that installation of the buoy does not occur during the period when juvenile Chinook salmon or other migrating juvenile salmonids are abundant in the Action Area. Although adult Chinook salmon, steelhead trout and bull trout could be present in the Action Area during installation, adult fish are highly mobile and able to avoid areas where construction is occurring. Therefore, although it is possible that adult salmonids could be present in the Action Area during project construction, the risk of direct mortality due to project construction is negligible.

5.2.1 Water Quality

The mooring buoy would be assembled on-site using hand tools (or delivered fully constructed) and installed by hand from a barge-mounted crane. The mooring buoy anchor would be slowly lowered over the edge of the work barge and gently placed on the substrate. Since the proposed location is in approximately 20 ft of water and the buoy anchor can be easily placed on the substrate, the installation of the buoy would not result in any impacts to water quality of the river. The work barge would be launched at the nearest boat launch. During installation of the buoy, the work barge will not be allowed to ground out. If machinery is used, BMPs will be incorporated into the project to minimize the potential for spills, including keeping construction equipment well-maintained, inspecting construction equipment daily for leaks, developing a spill prevention containment, and control plan and keeping oil absorbent material on-site during construction (see Section 7). If a spill were to occur, work would be stopped immediately, steps would be taken to contain the material, and appropriate agency notifications would be made. Overall, the risk of an accidental spill is negligible.

As noted previously, adult salmonids are highly mobile and are able to avoid areas where construction is occurring. Thus, adverse impacts to the listed fish species related to water quality are not expected to occur during buoy installation. Installation of the buoy would therefore have a negligible effect on salmonids that may be present.

5.2.2 Predation

In freshwater environments inwater structures can provide cover for native and non-native piscine predators and other fish that prey on juvenile salmonids. Resident fish in the Columbia River that are known to consume salmonids and may congregate around overwater structures include the northern pikeminnow, smallmouth bass, black crappie, white crappie, and yellow perch (NOAA 2003a, 2003b). Because visual acuity in a juvenile salmonid may be compromised when it passes from a light to a darkly shaded area (Brett and Ali 1958; Ali 1960; Protasov 1970), the ability of the fish to detect and avoid predators can be temporarily impaired.

It is unlikely that juvenile salmonids would be present in the Action Area. As mentioned above, most juvenile salmonids migrating past the Action Area are likely larger fish that have spent some time rearing in colder upper tributaries and would not be strongly shoreline oriented (see Section 3). Additionally, data collected on migration rates of spring Chinook salmon and steelhead trout smolts through the Action Area indicate that these fish are actively migrating through this stretch of the Columbia, indicating that these fish would remain in deeper waters of the main river channel and outside of the shallower areas along the shoreline.

If juvenile salmonids were present, it is unlikely that the proposed mooring buoy would result in conditions by which predation could increase. The completed project would reduce in minimal shading associated with the moorage of the applicant's boat, which would still be anchored on site regardless of the proposed project. The buoy would allow the boat to rotate that will not allow the shading to always occur in one location and never for a long enough period. When the boat is not moored on the buoy, the minimal nature of the buoy is not expected to result in conditions that would promote an increased potential for predators to prey on juvenile salmonids. The potential for predators to utilize the mooring buoy or boat as refuge from the current is not expected due to the lack of vertical structure.

In addition, the proposed mooring buoy will include the following design modifications to minimize the potential for the structure to result in increased predation on ESA-listed salmonids:

- Eliminating the need for continued placement and extraction of a boat anchor.
- The mooring buoy will be installed approximately 50 ft waterward of the OHWM in a water depth of approximately 20 ft below the OHWM.

These conservation measures, combined with the minimal structural nature of the mooring buoy, minimizes potential hiding habitat for ambush-style predators. For these reasons, the project is very unlikely to cause an increase in predation on listed salmonids.

5.2.3 Effects on Habitat

Productivity can be lower in areas shaded by overwater structures than in unshaded areas (Kahler et al. 2000). The proposed mooring buoy was selected to minimize the potential for shading the underlying bottom substrate. By installing the mooring buoy, the applicant's boat will be moored in the same location each time and will not continually drop and pull the boat anchor. Further the boat moored on the buoy will rotate and will not negatively impact the

existing aquatic vegetation if present, which is primarily milfoil. Additionally, the project includes plans to install 248 sq ft of mitigation planting on the property to compensate for any loss in productivity that could occur as a result of the mooring buoy (riparian vegetation is known to increase habitat complexity and inputs of detritus to the aquatic environment and to provide refuge for juvenile salmonids). The mitigation planting area will be located along the community trail adjacent to the OHWM. The areas will be planted with native riparian species.

The potential for decreased productivity is not likely to have a measurable effect on listed salmonids, as Chinook salmon and steelhead trout smolts have been shown to actively migrate through this stretch of the Columbia (Fish Passage Center 1987; Chelan County PUD 1998a). This indicates that these fish would remain in deep waters of the main river channel and outside of the project Area. Overall, productivity effects on juvenile salmonids would be limited, given the conservation measures incorporated into the project design, the active migration of juvenile salmonids through the area, and the increased productivity to be provided by the riparian planting plan.

5.2.4 Future Boating Activity and Site Use

The proposed project would improve the existing boat moorage at the site. The proposed project would not result in any changes to the exiting boating activity or site use; thus future boating activity and site use would not change from the existing conditions. The installation of the proposed buoy is not expected to increase the recreational activity on the Wells Reservoir, rather the mooring buoy would provide a safe area for boat while moored at the property. Further this would eliminate the continual placement of an anchor.

As stated above, the site is currently subject to intensive recreational boating activity. The existing boat activity consists of public use of the river and use by the applicant and the adjacent property owners. The heavy-use period occurs primarily between the middle of June and the middle of September, with most activity within the reservoir occurring towards the center of the river, in deeper water greater than 25 ft.

Boats that utilize the mooring buoy would be removed from the water for fueling and maintenance. No fueling or maintenance activities would occur at the buoy. The project is not expected to change the zone of typical use of the property and river.

5.3 DIRECT AND INDIRECT EFFECTS ON UTE LADIES'-TRESSES

As noted in Section 4, the Ute ladies'-tresses does not occur within the Action Area, and suitable habitat for this species does not occur on or in proximity to the project site. There will be no effects related to construction, use, or maintenance of the project on the baseline condition for this species or its habitat.

5.4 INTERDEPENDENT AND INTERRELATED ACTIONS

The intent of the mooring buoy is to provide safe moorage for recreational access to the river for the property owners. The mooring buoy would primarily be utilized for seasonal private use of the lake, to include swimming, boating, and fishing, and would protect the applicant's

boat from potential wave damage. Therefore, any changes in use of the reservoir are expected to be minimal and are expected to have a negligible effect on ESA-listed salmonids.

5.5 CUMULATIVE EFFECTS

From an ESA perspective, the analysis of cumulative effects considers future non-Federal actions (i.e., non-Federal projects that do not require Federal permits) that may affect habitats and listed species in the Action Area. Thus, this analysis does not address the potential construction of new docks or other projects that would occur below OHWM.

The project would occur in Chelan County. Based on the development of Chelan County it is expected that the population within Douglas County will increase. It is expected that the rate will not be higher than the Washington State average, as the County is comprised of mostly vacation and recreational properties and not primary residences. Recent population growth in Washington State was measured at 13% (WA State Office of Financial Management 2010). Based on this information, it is possible that population growth in the greater vicinity of the project will exceed the state average. However, there is limited property along the Columbia that can be developed.

The immediate vicinity (upriver and downriver) of the subject properties consists of large private parcels in agriculture, residential or recreational use. There are also large tract of undeveloped property. However, all of the waterfront is owned by Grant County PUD meaning that all development needs to be approved by the PUD and their shoreline master program. This eliminates the opportunity for private overwater structures.

Overall, the cumulative effects related to this project are anticipated to be very minimal.

6 CRITICAL HABITAT EVALUATION

6.1 CHINOOK SALMON AND STEELHEAD TROUT CRITICAL HABITAT

On September 2, 2005, NMFS designated critical habitat for numerous ESUs, including Upper Columbia River spring-run Chinook salmon and Upper Columbia River steelhead trout (NOAA 2005). Because the project is to occur within an area that is designated as critical habitat for the Upper Columbia River Chinook salmon ESU and Upper Columbia River steelhead ESU, an analysis on the potential effects of the project on this is presented below.

This analysis evaluates the potential effects of the project on Chinook salmon and steelhead trout critical habitat by means of the primary constituent elements (PCEs) of critical habitat presented in the Federal Register (NOAA 2005) describing the critical habitat designated by NMFS.

6.1.1 Geographical Extent of Designated Critical Habitat

The project Area is located in the Upper Columbia River spring-run Chinook salmon ESU, which includes approximately 974 miles of streams and 4 square miles of lakes designated as critical habitat (NOAA 2005). The area designated as critical habitat for this ESU is divided into five subbasins/units. The project's Action Area is located within the Chief Joseph Subbasin, which extends from Chelan Falls upstream to the mouth of the Methow River.

The project Area is also located in the Upper Columbia River steelhead trout ESU, which includes approximately 1,262 miles of streams and 7 square miles of lakes designated as critical habitat (NOAA 2005). The area designated as critical habitat for this ESU is divided into nine subbasins/units; the project's Action Area is located within the Chief Joseph Subbasin, which extends from Chelan Falls upstream to Chief Joseph Dam.

Critical habitat within fresh water includes the stream channel within the designated stream reaches, which includes a lateral extent as defined by the OHWM (NOAA 2005).

6.1.2 Effects on the Primary Constituent Elements

NMFS identified six critical habitat types, or PCEs (i.e., physical and biological features), that are "essential for conservation of these ESUs" (NOAA 2005). Three of the six PCEs pertain to marine environments and three pertain to freshwater environments. The three freshwater PCEs are discussed below, along with the potential impacts to these PCEs that may result from the project.

It is important to note that the Columbia River no longer functions like a typical riverine ecosystem. The installation of dams along the length of the river has created a series of reservoirs, controlled overbank flooding, and virtually eliminated certain habitat elements that are important to salmonids, such as backwater habitat and oxbows. Therefore, many of the critical habitat attributes that are discussed in this section are either non-existent or extremely limited in the Columbia River.

6.1.2.1 Primary Constituent Element 1

PCE 1 includes "freshwater spawning sites with water quality and quantity conditions and substrate supporting spawning, incubation, and larval development."

It is recognized that gravel substrates are critical for spawning and larval development. There is no suitable spawning habitat for Chinook salmon or steelhead trout in the immediate vicinity of the Action Area. Substrates consist of fine sediments and sand or cobble. Further, according to WDFW's SalmonScape, no Chinook salmon or steelhead trout spawning occurs in this portion of the Columbia River (WDFW 2015). Hence, no long-term adverse impacts on freshwater spawning sites utilized by Chinook salmon or steelhead trout are expected to occur as a result of the project.

6.1.2.2 Primary Constituent Element 2

PCE 2 includes "freshwater rearing sites with (a) water quality and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility, (b) water quality and forage supporting juvenile development and (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."

Freshwater rearing does not likely occur in the Action Area. Rearing typically occurs in smaller tributaries such as the Entiat, Methow, or Wenatchee Rivers. The buoy would be located in a portion of the Columbia River through which salmonids are actively migrating and in which they spend little time (see Section 4). Little mature riparian vegetation is present in the Action Area, as the Action Area is completely waterward of the OHWM. The minimal structure associated with the mooring buoy would allow ample light penetration to maintain aquatic vegetation beneath the mooring buoy and moored vessel. Additionally, fish present within the Action Area are primarily migrating, and are not likely to remain in the Action Area for an extended period of time. Overall, no long-term adverse impacts on freshwater rearing sites utilized by Chinook salmon or steelhead trout are expected to occur as a result of the project.

6.1.2.3 Primary Constituent Element 3

PCE 3 includes "freshwater migration corridors free from 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 Action Area is likely used primarily by Chinook salmon and steelhead trout as a migratory corridor. Overall, the potential effects of the mooring buoy on the nearshore environment are not expected to have a measurable impact on listed salmonids, as Chinook salmon and steelhead trout smolts have been shown to actively migrate through this stretch of the river (Fish Passage Center 1987; Chelan County PUD 1998a). This indicates that these fish would remain in the main river channel away from the mooring buoy. It is expected that steelhead trout migrating through the Action Area will be of a larger size, and therefore less likely to utilize any backwater habitat that may exist within the Action Area. Consequently, effects of

the proposed project on the migration corridor would be limited, given the conservation measures incorporated into the project design, the active migration of juvenile salmonids through the area, and the increased productivity to be provided by the proposed riparian planting plan.

The primary mechanism by which the project could affect Chinook salmon and steelhead trout migratory corridors is through new inwater coverage. Numerous studies have been conducted to examine the behavior of juvenile salmonids as they encounter overwater, inwater, and shoreline structures. Of particular concern has been the potential for diverting migrating juveniles around structures into deeper water, subjecting the fish to a greater risk of predation. Additionally, structures can provide cover for native and non-native piscine predators that prey on juvenile salmonids. However, the project includes conservation measures designed to lessen the effects of the project (e.g., minimal structural associated with buoy, installation approximately 50 ft waterward of the OHWM). Thus, should juvenile salmonids enter the Action Area, it is unlikely that they would be diverted into deeper water, but would likely pass under the buoy or boat moored to the buoy (see Section 5).

6.2 COLUMBIA RIVER BULL TROUT CRITICAL HABITAT

USFWS recently expanded bull trout critical habitat to include the mainstem Columbia River (effective November 17, 2010). This listing extends up to Chief Joseph Dam. Additionally, the PCEs from the original listing were rearranged. The project's effects on bull trout critical habitat are discussed below, in the context of potential effects to the PCEs.

6.2.1 Primary Constituent Element 1

Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

No springs, seeps, groundwater sources, or subsurface water connectivity exist in the Action Area. If these features were present in the Action Area, the project has no mechanism to affect them. Thus, the project would not affect this PCE.

6.2.2 Primary Constituent Element 2

Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.

According to USFWS (2009), the Upper Columbia River Basins Critical Habitat Unit "supports populations in core areas that exhibit unique adfluvial, fluvial, and allucustrine life history movements between lakes, rivers, and the mainstem Columbia River (18)." Thus, the Action Area likely serves as a migratory corridor for bull trout between the Columbia River and the upper tributaries or lakes in which spawning occurs. Migrating bull trout would be larger fish (sub-adult or adult) and are expected to remain in the mid-channel area, well away from the proposed mooring buoy. The proposed project would not result in a barrier to migration due to the minimal structure of the mooring buoy, nor would the mooring buoy impact water quality within the Project Area. Riparian plantings would improve migratory

habitat due to the contribution of the overhanging shrubs and trees of organic material and terrestrial invertebrates.

6.2.3 Primary Constituent Element 3

An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

Sub-adult and adult migratory bull trout are opportunistic feeders and generally consume large quantities of small fish in freshwater environments (USFWS 2005). Overall, the project would have negligible impact on bull trout food base. The project is not expected to result in significant changes in the amount of small fish present in the Action Area. The riparian planting area is expected to increase forage by providing terrestrial invertebrates into the water. Overall, the project will have negligible short- and long-term effects on bull trout food base.

6.2.4 Primary Constituent Element 4

Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.

The site is located on the eastern shoreline of the Columbia River. The shoreline aquatic environment at the site does not consist of a complex shoreline environment. The shoreline consists of a high, steep bank at the OHWM, with cobbly substrate. Minimal riparian vegetation is present along the shoreline. Thus, complex shoreline habitat does not exist at the site. For this reason, the project would not affect this PCE. Mitigation plantings would compensate for the impacts to the aquatic habitat and would increase overhanging vegetation, improving shoreline habitat for bull trout. However, the inability of trees to establish at the shoreline limits the potential for large wood at the site.

6.2.5 Primary Constituent Element 5

Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.

Water temperature in the Rocky Reach Reservoir varies seasonally, from as low as approximately 5 degrees Celsius in the winter to approximately 19 degrees Celsius in the summer (http://www.cbr.washington.edu/dart/adultpass.html). The project would have no noticeable effect on water temperature at the site.

6.2.6 Primary Constituent Element 6

In spawning and rearing areas, substrate 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. A minimal amount of fine sediment, generally ranging in size from silt to

coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system.

Substrate at the site consists primarily of cobble. No adequate spawning and incubating gravels exist at the site. Further, spawning does not occur at the site. Thus, the project would have no effect on this PCE.

6.2.7 Primary Constituent Element 7

A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.

The hydrograph of the Columbia River is controlled primarily by dam operations, which cause daily water level fluctuations. The Columbia River's water level is higher in the spring, but typically varies little by season. The project would have no effect on the hydrograph of the river.

6.2.8 Primary Constituent Element 8

Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

Reproduction and growth are not expected to occur in the Action Area, as this stretch of the Columbia River is primarily used as a migratory corridor for sub-adult and adult bull trout. Potential water quality impacts were discussed in Section 5 of the BA. It was determined that any potential water quality impacts would be minor, localized, and temporary, and would be controlled by BMPs. Further, any bull trout in the vicinity would likely be migrating sub-adult or adult fish, which are highly mobile and would be expected to avoid the area of water quality impairments. Juvenile bull trout are not expected to be present in the project Area. Overall, the project is not anticipated to produce water quality conditions such as could inhibit reproduction, growth, and survival. Water quantity would not be affected by this project.

6.2.9 Primary Constituent Element 9

Sufficiently low levels of occurrence of nonnnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

Predatory species such as bass, walleye, and northern pikeminnow are present in the Columbia River. Brook trout and brown trout may also be present. The project's effects on predation were discussed in the BA Section 5. It was determined that, based on the minimization measures incorporated into the installation of the mooring buoy (depth, existing vegetation, minimal structure of a buoy, etc.) predation would be very unlikely to increase as a result of the project.

6.3 INTERDEPENDENT AND INTERRELATED EFFECTS

There are no interdependent or interrelated actions that will affect steelhead trout or bull trout critical habitat in the Action Area. The project will not alter the type of use within the Action Area; that is, the range of uses in the Action Area will remain as they are currently.

7 CONSERVATION MEASURES RELATED TO THE SPECIES

7.1 IMPACT AVOIDANCE AND MINIMIZATION

The project has incorporated a number of design approaches to avoid and to minimize potential adverse impacts of the project. The following features have been incorporated into the project design to minimize the potential for the project to impact listed species:

- The mooring buoy will be installed approximately 50 ft waterward of the OHWM.
- The mooring buoy will be placed at a water depth of approximately 20 ft.

7.2 REGULATORY CONSIDERATIONS

Federal, State, and Local permits contain conditions that are intended to reduce the potential for short-term effects from in-water construction activities and long-term effects from habitat change. The provisions comprise a list of conservation measures that are applied to projects in fresh water. Conditions that are part of project permits will be conservation measures for the project. Permit conditions are expected to include the following:

- Timing restrictions on in-water work to protect fish in vulnerable life history stages. The in-water construction would occur during the approved in-water work window (July 16 through February 28) for the protection of migrating juvenile salmonids.
- Corrective measures that must be implemented if water quality problems, fish distress, or fish kill occurs.
- Planting native shrubs in the riparian area. One (1) 248 sq ft mitigation planting area would be installed on the property to offset productivity impacts of new overwater coverage of the proposed mooring buoy.
- The mitigation planting area would be installed prior to or concurrent with the installation of the mooring buoy.
- The mitigation planting area would be maintained at 100% survival for years 1-2, then 80% survival for years 3-5.
- Mitigation planting areas will be required to remain in place for the life of the mooring buoy.
- A mitigation planting area as-built report would be sent to the Corps and NMFS following installation of the mitigation planting area.
- Annual mitigation monitoring reports would be sent to the Corps and NMFS for years 1-5 after planting.
- The riparian planting installed to mitigate for the potential impacts of the project will be preserved and maintained for as long as the authorized project remains in place.

7.3 BEST MANAGEMENT PRACTICES

BMPs are employed to reduce the potential for construction-related impacts on species and habitats. The following BMPs will be followed for this project:

- Extreme care will be taken to prevent any petroleum products, chemicals, or other toxic or deleterious materials from entering the water. If a spill were to occur, work would be stopped immediately, steps would be taken to contain the material, and appropriate agency notifications would be made.

- No fueling of any boats will occur at the mooring buoy.

- All equipment operating waterward of the OHW line will be inspected daily for fluid leaks. Leaking equipment will be repaired prior to resuming operation.

- Shoreline planting efforts will be completed either prior to or concurrent with the construction of the proposed buoy (or the first optimal planting time following the completion of the project; spring or fall).

- No herbicides, fertilizer, or pesticides will be applied to the mitigation planting area.

8 CONCLUSIONS AND DETERMINATIONS

8.1 SUMMARY OF EFFECTS

The potential impacts to ESA-listed salmonid species were discussed in Section 5 of this document. Juvenile Chinook salmon, steelhead trout and bull trout are expected to be absent or present in relatively low numbers during project construction. Overall, the proposed project is considered to entail a negligible risk of take of listed salmonids.

Implementation of the project is not expected to result in water quality conditions that are dangerous to salmonids, and no adverse water quality effects on salmonids are likely to occur. With the implementation of appropriate conservation measures the installation of the proposed buoy is considered to have a negligible risk of mortality or injury to listed salmonids.

Although it is recognized that overwater coverage and other in-water structures can provide cover for ambush-style predators, the mooring buoy and attached boat will significantly minimize the potential for the project to result in increased predation on listed salmonids. These conservation measures will also minimize shading/impact of the benthic substrates. Because of the Conservation measures, which include adherence to in-water work windows and planting of riparian vegetation on the site, the project's effects on ESA-listed species and habitat would be minimal. Further, listed salmonids residence time within the Action Area is likely limited, as studies have indicated that Chinook and steelhead smolts migrate actively through this stretch of river (i.e., rearing is more likely to occur in the cooler waters of upper tributaries).

Suitable habitat for Ute ladies'-tresses does not occur in the Action Area and construction; use and maintenance of the project would not affect this species or its habitat.

8.2 DETERMINATION OF EFFECTS – SPECIES

As discussed above, the Corps has indicated NMFS' determination that all new residential overwater structures or inwater mooring facilities on the Columbia River between Chief Joseph Dam and Rock Island Dam will result in a "may affect, likely to adversely affect" call. Based on the analysis in this BA, the project ***may affect, and is likely to adversely affect*** Chinook salmon and steelhead trout. USFWS has not made this determination for bull trout. Thus, based on the analysis in this BA, the project ***may affect, but is not likely to adversely affect*** bull trout. The project would have ***no effect*** on Ute ladies' tresses.

8.3 DETERMINATION OF EFFECTS – CRITICAL HABITAT

As discussed above, the Corps has indicated NMFS' determination that all new residential overwater structures or inwater mooring facilities on the Columbia River between Chief Joseph Dam and Rock Island Dam will result in a "may affect, likely to adversely affect" call. Based on the analysis in this BA, the project ***may affect, and is likely to adversely affect*** Chinook salmon and steelhead trout. USFWS has not made this determination for bull trout. Thus, based on the analysis in this BA, the project ***may affect, but is not likely to adversely affect*** bull trout. The project would have ***no effect*** on Ute ladies' tresses.

9 ESSENTIAL FISH HABITAT ASSESSMENT

9.1 ESSENTIAL FISH HABITAT DESIGNATIONS

Pursuant to the MSFCMA and the 1996 SFA, an EFH evaluation of impacts is necessary for the project. EFH is defined by the MSFCMA in 50 CFR 600.905-930 as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Further definitions include:

- **Waters:** Aquatic areas and associated physical, chemical, and biological properties that are used by fish.
- **Substrate:** Sediment, hard bottom, structures underlying the waters, and associated biological communities.
- **Necessary:** The habitat required to support a sustainable fishery and managed species' contribution to a healthy ecosystem.

The Upper Columbia River and its tributaries are designated as EFH for two salmonid species, as indicated in Table 1. Salmonid EFH is discussed in Appendix A of Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). There is no designated EFH for groundfish or pelagic species in the vicinity of this project.

Table 1. Pacific Salmonid Species with Designated EFH in the Columbia River

Pacific Salmon Species	Scientific Name	EFH
Coho salmon	*Oncorhynchus kisutch*	Adults – freshwater systems, pelagic and nearshore waters on migration back to freshwater, not necessarily associated with any habitat type in marine waters Juveniles – marine, estuarine, nearshore to pelagic, associated with all bottom types; 0 – 240 feet Larval Stage – gravel and shallow water in streambeds Spawning – freshwater Egg Stage – gravel and shallow water in streambeds
Chinook salmon	*Oncorhynchus tshawytscha*	Adults – freshwater systems, pelagic and nearshore waters on migration back to freshwater, not necessarily associated with any habitat type in marine waters Juveniles – estuary and oceanic, associated with all bottom types; 0 – 240 feet Larval Stage – gravel and shallow water in streambeds Spawning – freshwater rivers, timing depends on run Egg Stage – gravel and shallow water in streambeds

9.2 ANALYSIS OF EFFECTS ON EFH

The assessment of potential impacts from the proposed project to the species' EFH is based on information in the above-referenced document (PFMC 1999).

The specific elements of the project that could potentially impact salmonid species EFH, impact mechanisms, and conservation measures that avoid and minimize impacts are identified in Table 2. Note that because the project is located in fresh water, the potential effects of the project are limited to the EFH for anadromous salmonid species.

Table 2. Affected EFH by project Element and Proposed Conservation Measures

project Element	Affected EFH	Impact Mechanism	Conservation Measures
Mooring Buoy Installation	Salmonid EFH (Substrate/ Waters)	Shading caused by overwater structures can lead to decreased primary productivity through light attenuation and provide refuge for predatory fish. The buoy will be installed in a location that is currently covered with milfoil and the shade from any vessel utilizing the buoy will result in little if any impacts. This is based on the fact that the boat will not be moored on the buoy for long periods of time and the fact that the boat will rotate on the buoy. This will eliminate the potential for the boat to impact one area and eliminate vegetation or impact productivity. The impacts of the buoy will comply with the current regulations for mooring buoys in the Columbia River and would not provide refuge for predatory fish over existing conditions.	**1, 2, 3, 4, 5, 6, and 7**
Riparian Planting	Salmonid EFH (Substrate/ Waters)	The planting plan for the mooring buoy will establish riparian vegetation along the shoreline and cover an area of approximately 248 sq ft on the applicant's property. The planting plan will have a positive effect on salmonid EFH by increasing habitat complexity and inputs of detritus to the aquatic environment, providing natural erosion control, establishing a pathway through which terrestrial insects can come into contact with the aquatic environment, and providing refuge for juvenile salmonids, other fish species and their prey.	**6 and 7**

Conservation Measures

1. Timing restrictions on in-water work to protect fish in vulnerable life history stages. All in-water construction will be accomplished during the approved in-water work window for this reach of the Columbia River (July 16 through February 28). No in-water work will be performed from March 1 through July 15 of any year.
2. No piles will be installed as part of this project.
3. The mooring buoy will be placed by hand slowly over the side of a work barge, which will eliminate the potential for any turbidity or spills of hazardous fluids associated with machinery.
4. If installed from a barge, the barge will not be allowed to ground out.
5. The mooring buoy will be located approximately 50 ft from the OHWM in a water depth of ~20 ft below OHW.
6. Post-project monitoring of the planting area to ensure the area provides the functions intended. Specifically, monitoring and contingency plantings (as needed) will be implemented to achieve 100 percent survival for years 1 and 2, and 80 percent survival for years 3 - 5.
7. Shoreline planting will be completed either prior to or concurrent with the construction of the proposed mooring buoy (or the first optimal planting time following the completion of the project; spring or fall).

9.3 EFH ASSESSMENT

Pursuant to the MSFCMA and the SFA, an EFH Assessment has been completed for this project. The impacts of the project on salmonid EFH are shown in Table 2. With the proposed avoidance and minimization measures, these impacts are expected to be minimal. These conservation measures are expected to greatly minimize the potential for the project to affect any shoreline-oriented juvenile salmonids that may enter the Action Area.

As discussed above, NMFS has indicated that all new overwater structures on the Columbia River between Chief Joseph Dam and Rock Island Dam will result in a call of "may adversely affect". For that reason, the determination of effects on EFH for this project is ***may adversely affect***.

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VAN LITH MOORING BUOY

PHOTOGRAPHS

Photograph 1. Oblique aerial of the Van Lith property showing buoy and trail location (Ecology 2017).

Photograph 2. Location of the mooring buoy.

Photograph 3. Existing conditions at the subject property immediately upriver of the proposed mooring buoy. This area was disturbed but has completely been restored.

Photograph 4. Existing conditions at the waterward end of the existing access trail where the mooring buoy will be installed.

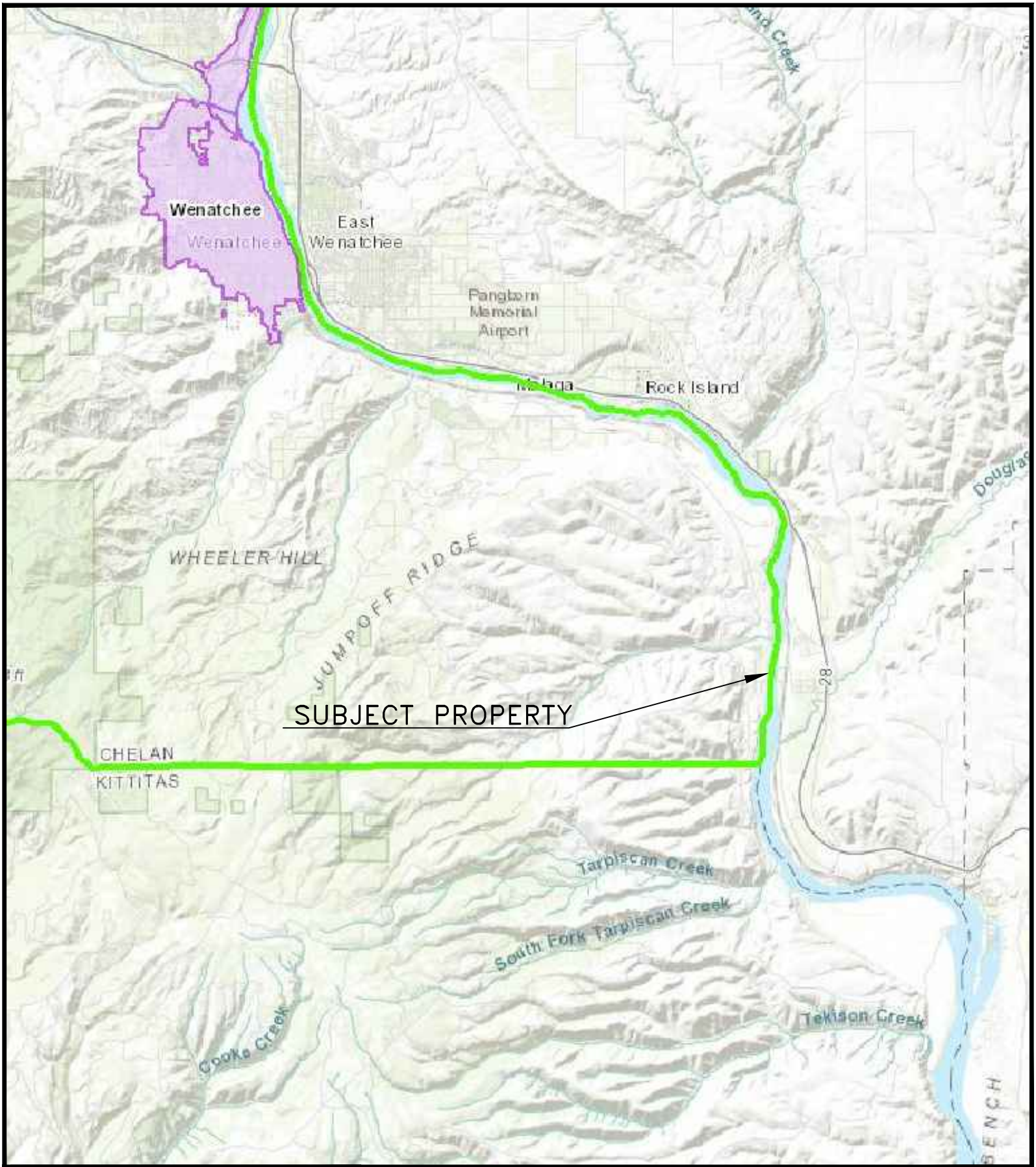
Photograph 5. Existing conditions of the existing access trail that will be maintained and restored.

Photograph 6. Existing conditions of the existing access trail that will be maintained and restored.

Photograph 7. Existing conditions of the existing access trail that will be maintained and restored.

VAN LITH MOORING BUOY

SHEETS



PURPOSE:
INSTALL A MOORING BUOY AND MAINTAIN TRAIL

①PUD NO 2 OF GRANT COUNTY
PO BOX 878
EPHRATA, WA 98823

②LACEY LEDBETTER
7625 TARPISCAN RD
MALAGA, WA 98828

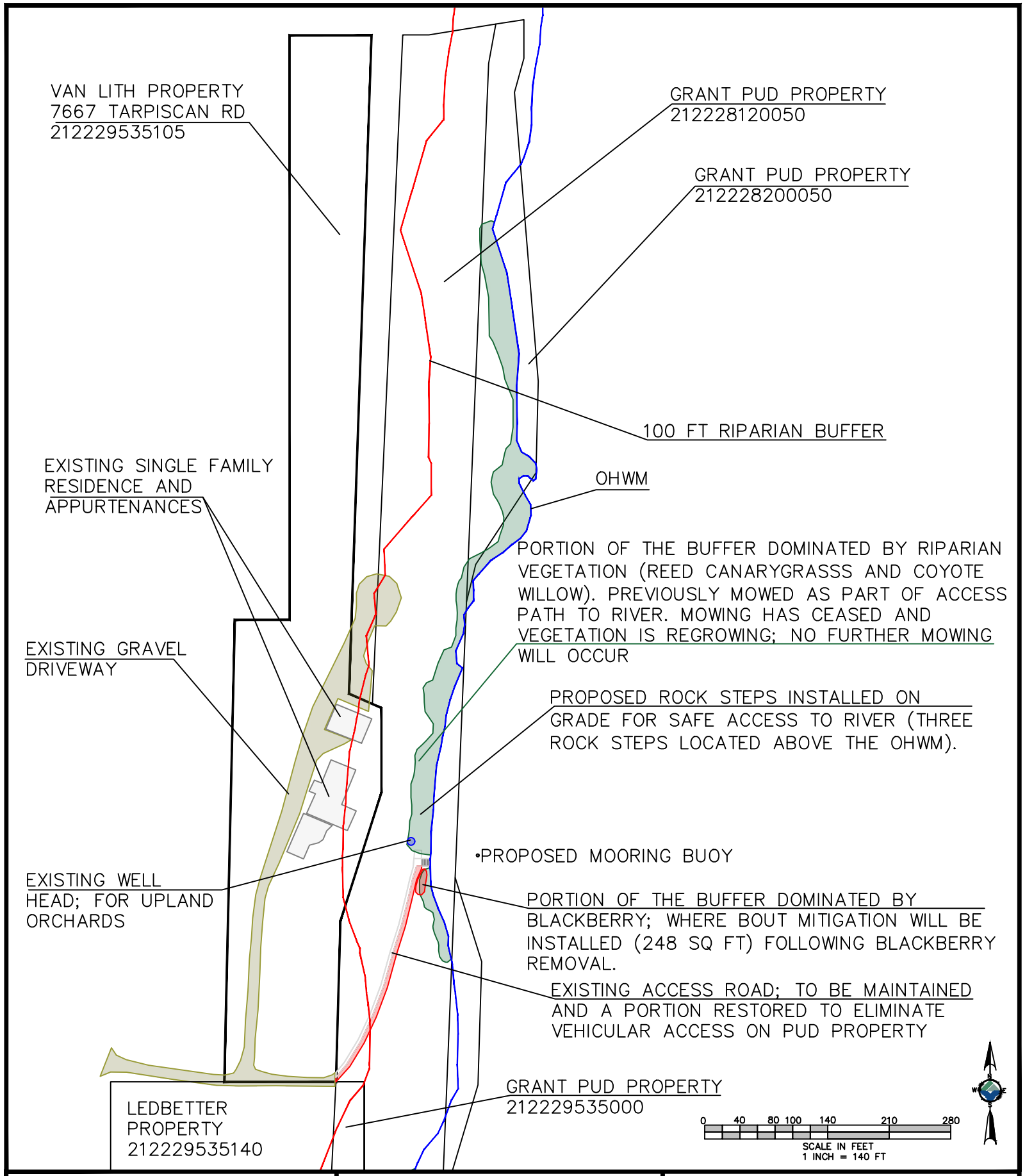
VICINITY MAP

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

VAN LITH MOORING BUOY AND TRAIL MAINTENANCE

IN: COLUMBIA RIVER
AT: 7667 TARPISCAN RD
MALAGA, WA 98828
COUNTY OF: DOUGLAS
STATE: WA
APPLICATION BY: MICHAEL VAN LITH

SHEET NO. 1 OF 5 DATE: 07/21/21



PURPOSE:
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SITE PLAN

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

VAN LITH MOORING BUOY AND TRAIL MAINTENANCE

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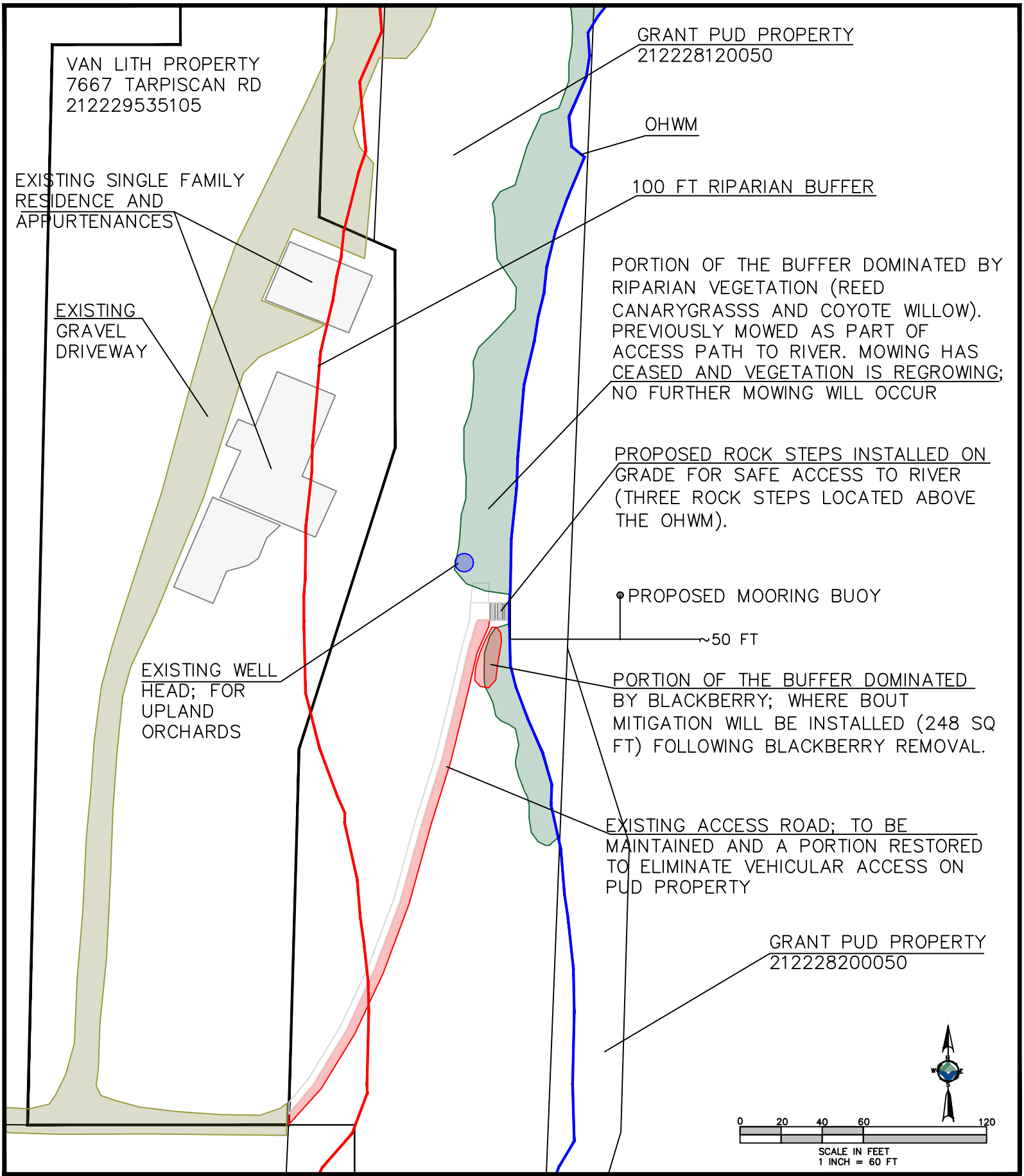
AT: 7667 TARPISCAN RD
MALAGA, WA 98828
COUNTY OF: DOUGLAS
STATE: WA
APPLICATION BY: MICHAEL VAN LITH

SHEET NO. 2 OF 5 DATE: 07/21/21



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DETAILED SITE PLAN

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

VAN LITH MOORING BUOY AND TRAIL MAINTENANCE

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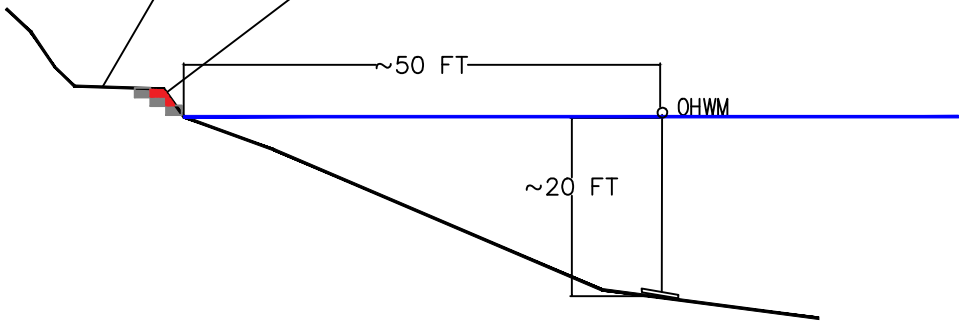
COUNTY OF: DOUGLAS
STATE: WA
APPLICATION BY: MICHAEL VAN LITH

SHEET NO. 3 OF 5 DATE: 07/21/21

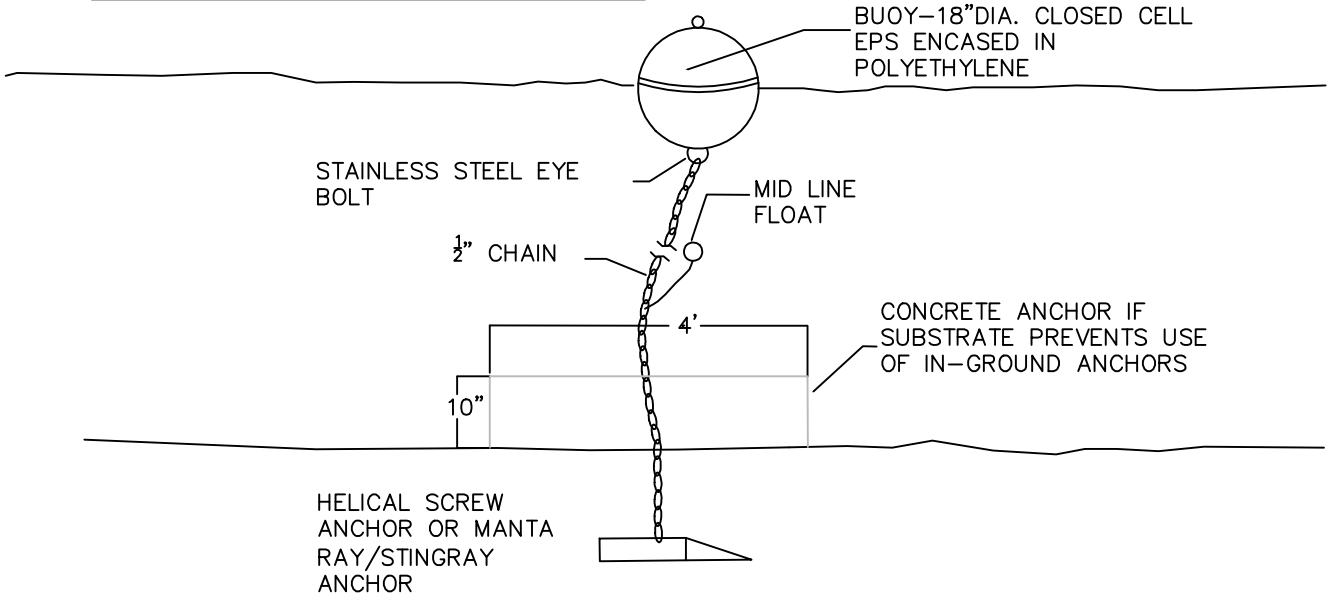
STEEP PORTION OF THE SHORELINE WHERE THE ACCESS ROAD WILL BE MAINTAINED AND A PORTION RESTORED.

EXISTING DIRT/GRAVEL ROAD FOR ACCESS TO THE EXISTING PUMP HOUSE LOCATED UPRIVER OF PROPOSED STEPS.

PROPOSED STEPS (3) WILL BE INSTALLED IMMEDIATELY LANDWARD OF THE OHWM TO PROVIDE SAFE ACCESS TO RIVER. WILL REQUIRE THE REMOVAL OF APPROXIMATELY 0.25 CYDS. NATIVE ROCK/BRICK STEPS WILL BE INSTALLED.



BUOY TO BE PLACED APPROXIMATELY 50 FT WATERWARD OF THE OHWM, AT A WATER DEPTH OF ~20 FT



PURPOSE:
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CROSS SECTION DETAILS

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

VAN LITH MOORING BUOY AND TRAIL MAINTENANCE

IN: COLUMBIA RIVER
AT: 7667 TARPISCAN RD
MALAGA, WA 98828
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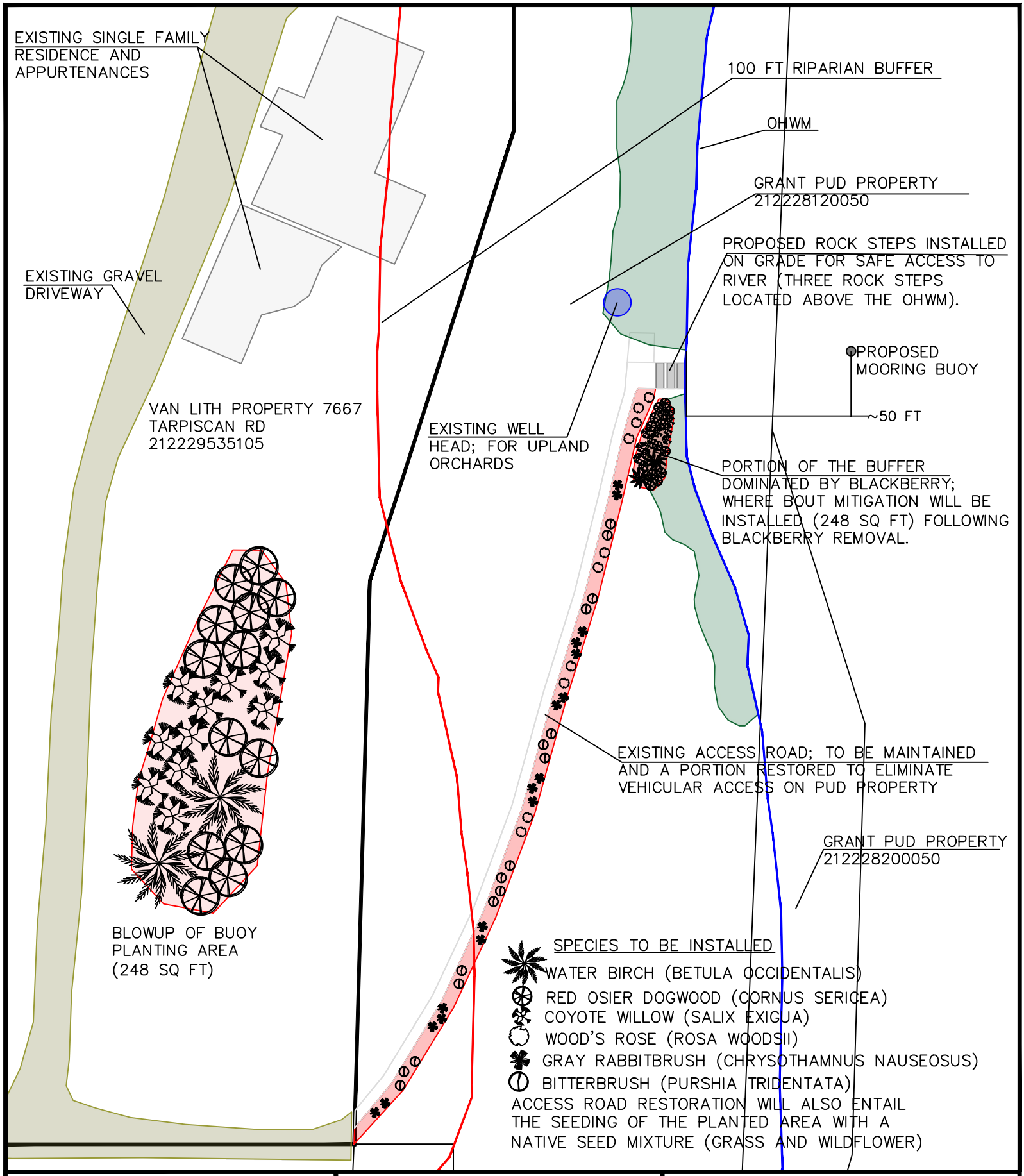
STATE: WA
APPLICATION BY: MICHAEL VAN LITH

SHEET NO. 4 OF 5 DATE: 07/21/21



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MITIGATION PLAN

Grette Associates LLC
ENVIRONMENTAL CONSULTANTS

VAN LITH MOORING BUOY AND TRAIL MAINTENANCE

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STATE: WA
APPLICATION BY: MICHAEL VAN LITH

SHEET NO. 5 OF 5 DATE: 07/21/21