

Critical Area Report

for

354 Island Aire Dr., Woodland, WA

May 2024

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ACRONYMS AND ABBREVIATIONS

City	City of Woodland
BMP	Best Management Practices
CAR	Critical Area Report
DNR	Washington Department of Natural Resources
ESA	Endangered Species Act
FT	Feet
NHP	Natural Heritage Program
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High-Water Mark
PHS	Priority Habitats and Species
SF	Square Feet
SFR	Single Family Residence
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WMC	Woodland Municipal Code

1 INTRODUCTION

The purpose of this report is to present the findings of a Critical Area Report conducted for 354 Island Aire Dr. (Parcel 064515-039) located in the City of Woodland (Figure 1). This report has been prepared following the City of Woodland Shoreline Master Program (SMP) Critical Areas Regulations set forth in Section 4.1. The investigation performed by Facet, was limited to the property in question and the immediate surrounding area.

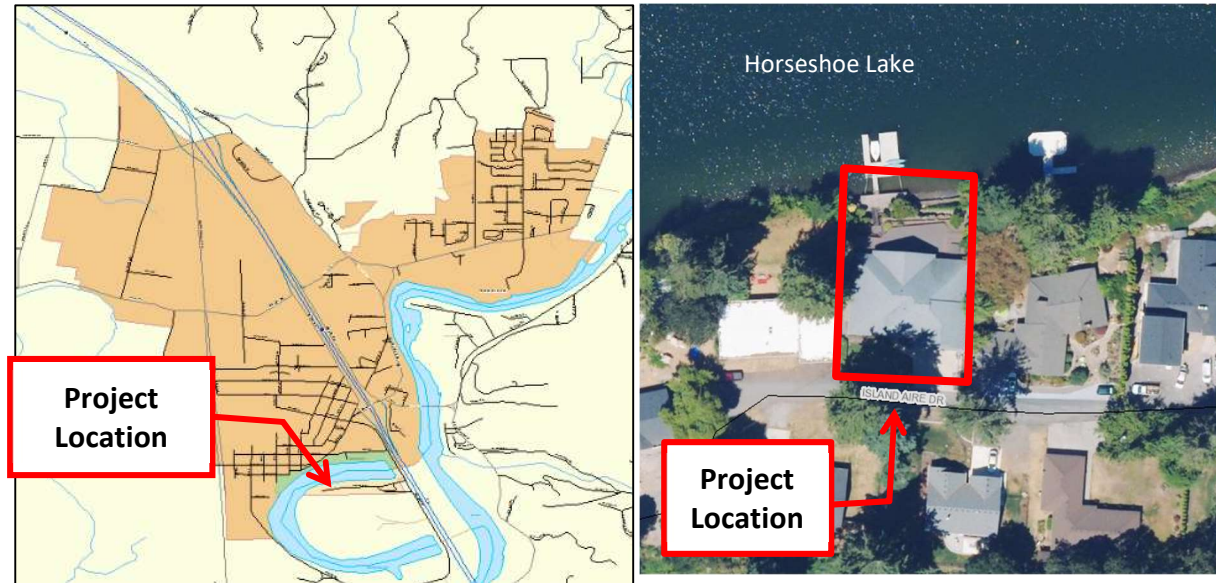


Figure 1. Vicinity and Site Maps

1.1 Project Description

The 0.25-acre property is located on the north facing shoreline of Horseshoe Lake, and includes one single-family residence, with a boat, dock and related utilities. A portion of the property's retaining wall has partially degraded, showing signs of a potential failure in the near future. The wall provides protection and support for the structures located approximately 35 feet landward of the wall. The failing portion of the retaining wall will be repaired using helical wall anchors secured to a steel channel on the wall face, acting as a waler beam. The crew will perform this work when the water has receded below the existing retaining wall, and sufficient shoreland is dry and available to conduct the repair. Minor excavation will be done, behind the wall, to allow clearance for the helical lead and handheld drive head that will be used to twist the helical lead into the sloped riparian area. The excavated area will be backfilled and restored to pre-existing conditions. A 6-mil thick plastic tarp will be placed along the shoreline area to ensure no concrete or dust/debris will enter the water.

2 EXISTING ENVIRONMENTAL CONDITIONS

2.1 Vegetation and Habitat Features

The shoreline consists of sand and small cobblestone. The riparian area is full of dense vegetation that consists of small deciduous trees and shrubs. Many of the shrubs overhang the existing retaining wall, providing shade and habitat for aquatic species. Other vegetation present on the property consists of landscaped shrubs and deciduous trees.

2.2 Surrounding Land/Water Uses

The property is located along the north-facing shoreline of Horseshoe Lake. According to the Washington Department of Fish and Wildlife (WDFW), Horseshoe Lake is managed as a catchable trout and warmwater species lake, stocked with rainbow trout and supporting populations of largemouth bass and other warmwater fish.

Horseshoe Lake Park is located across the lake, along the south-facing shoreline. The 6.5-acre park is open to the public and widely used for community events such as farmers markets and the annual fish derby. Facilities in the park include picnic areas, a gazebo, open space, playgrounds, restrooms, and a skate park.

2.3 Level of Development

The subject property is located in a low-density shoreline residential community. The surrounding land-use is single-family residential. There is a 78.98-acre parcel located approximately 120 feet to the south zoned as single-family residential, low density.

2.4 Water Quality

Water quality near the project site has been rated as Category 4C by the Department of Ecology for the parameter of non-native aquatic plants.

3 CRITICAL AREA REVIEW

Facet staff conducted background research using a variety of online sources, literature, and maps to identify wetlands, streams, and site characteristics indicative of critical area features in the study area (**Appendix I**). Key sources of information included the following:

- Cowlitz County GIS Primary Web Mapper
- Department of Ecology Water Quality Atlas
- Department of Natural Resources (DNR) Washington Natural Heritage Program (WNHP) Data Explorer
- Clark County Environmental Map
- National Wetlands Inventory (NWI)
- Natural Resources Conservation Service (NRCS) Soil Mapper
- Washington Department of Fish and Wildlife's (WDFW) Priority Habitats and Species (PHS) Mapper
- WDFW Forage Fish Mapper
- WDFW SalmonScape Mapper

3.1 Fish and Wildlife Habitat Conservation Areas

Horseshoe Lake and the shoreline are considered Fish and Wildlife Habitat Conservation Areas (FWHCA) per WMC 15.08.700. The shoreline designation for the property is Residential. The riparian habitat area width for this shoreline designation is 50 feet, measured landward from the ordinary high-water mark (OHWM). The building setback for this designation is 10 feet in accordance with Section 7.1, Table 7-1 of the Woodland SMP.

Priority Habitats and Species (PHS) Mapper (2023) depicts the site location to potentially contain Oak Woodland, and big brown bat (*Eptesicus fuscus*). However, the site is not forested, and therefore, does not have a suitable habitat for big brown bats. Additionally, the U.S. Fish and Wildlife Information for Planning and Consultation lists the northwestern pond turtle and monarch butterfly as sensitive species, however, no other habitats or species of local importance per WMC 15.08.700 are known to occur within the project area. The DNR Natural Heritage Mapper (2024) does not depict any critical habitats on site, or within 1,000 feet of, the project area.

Cowlitz County GIS Primary Web Maps the Lewis River as being located approximately 1,850 feet east of the subject property. Lewis River is a fish-bearing river with a riparian area buffer of 200 feet per WMC 15.08.730. Horseshoe Lake was once part of the Lewis River until it was cut off in 1940 during the construction of Highway 99. Water is now pumped into the lake from a 16" diameter culvert (WDFW, 2024). WDFW has stated that eulachon juveniles do enter the lake from Lewis River, but it is unknown if they die off or are able to exit through the culvert. Additionally, coho salmon from a hatchery have been discovered in Horseshoe Lake, therefore it is assumed salmon could be present, but it is unlikely. All project activities are located outside of Lewis River and its associated buffer; therefore, the project will have no impact on rivers.

3.2 Wetlands

Wetland maps prepared by NWI (2024), depict the presence of a 25.89-acre freshwater, emergent wetland approximately 280 feet south of the subject property. Per WMC 15.08.400, it is estimated that the buffer for this wetland is 75 to 100 feet. Additionally, the project site is a downgradient of this wetland. Therefore, it is anticipated that construction activities will have no impact on the wetland or its associated buffer.

3.2.1 Soils

The NRCS soil survey map identifies one soil type on the subject property, which is not listed as hydric per the Clark County Hydric Soils List. The Clark County Property Information Center also identifies the subject property as having non-hydric and PuA soils. A summary of the map unit is provided in Table 1. The DNR Washington Natural Heritage Program Data Explorer does not identify the property as containing hydric soil.

Table 1. Soil Unit Hydric Ratings

Map Unit Symbol	Map Unit Name	Unit Considered Hydric in Island County
PuA	Puyallup fine sandy loam, 0 to 3 percent slopes	No

3.3 Geologically Hazardous Areas

The Clark County Property Information Center (2024) identifies the property as having slopes greater than 15%. No unstable slopes are identified on the subject property. The Clark County Property Information Center (2024) identifies the property as being located within a moderate to high Liquefaction area.

3.4 Critical Aquifer Recharge Areas

The project site is not located in a critical aquifer recharge area. There is a Category 2 critical aquifer recharge area located approximately 175 south of the subject parcel. Additional BMPs may be required if the Health Department requests it.

3.5 Frequently Flooded Areas

FEMA flood maps identify the shoreline of the property as being located outside of the FEMA Flood Zones. The area has a reduced flood risk due to the levee. With BMPs in place, the proposed development will have no impact on the floodplain.

4 ACTION AREA

The action area is defined by the Endangered Species Act (ESA) regulations (50 CFR 402.02) as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” The action area is distinct from the project footprint and encompasses a larger area extending to where no measurable effects from the project were anticipated to occur. For this project, the action area includes the project footprint, as described above, as well as the upland area within which all project-related noise levels reach background levels.

5 SPECIES INFORMATION

The following species listed under the federal Endangered Species Act may occur in the vicinity of the project area or might be affected by the proposed work:

1. Lower Columbia Steelhead (*Oncorhynchus mykiss*)
2. Lower Columbia River Chinook Salmon (*Oncorhynchus tshawytscha*)
3. Columbia River Chum Salmon (*Oncorhynchus keta*)
4. Lower Columbia River Coho Salmon (*Oncorhynchus kisutch*)
5. Columbian White-tailed Deer (*Odocoileus virginianus leucurus*)
6. Bull Trout (*Salvelinus confluentus*)
7. Yellow-billed Cuckoo (*Coccyzus americanus*)
8. Eulachon (*Thaleichthys pacificus*)

5.1 Lower Columbia Coho Salmon

Lower Columbia coho salmon are a species of salmon native to the Pacific Northwest. They are anadromous fish that can be found in freshwater streams and rivers of the Columbia River basin in Oregon and Washington, as well as in coastal streams and tributaries or smaller neighborhood streams. Coho salmon migrate to the marine environment approximately 18 months after being deposited. They typically return to their natal streams to spawn where they deposit their eggs in the fall. They prefer to spawn in areas of mid-velocity water with small to medium sized gravels. Their eggs begin to develop over the winter months and emerge from the gravel the next spring. Coho fry are usually found in the pools of small coastal streams and in the tributaries of large rivers. Once they are mature, they prefer urban settings of cold, clean and year-round water. Because they use small streams with limited space, they must use many such streams to successfully reproduce, which is why coho can be found in virtually every small coastal stream with a year-round flow.

5.2 Lower Columbia Steelhead Trout

Steelhead trout exhibits perhaps the most complex suite of life-history traits of any of the Pacific salmon. Steelhead can be anadromous or freshwater residents and, in some circumstances, yield offspring of the opposite life-history form. The anadromous form can spend up to seven years in freshwater prior to smoltification, although two years is most common, and then spend up to four years in saltwater prior to first spawning. Unlike the Pacific salmon species, steelhead are iteroparous (individuals can spawn more than once). The adult winter steelhead run is generally from December to February, and spawning occurs from March through June (Wydoski and Whitney, 2003). Juvenile steelhead out-migrate from April through June and are not anticipated in the nearshore in large numbers because the majority of steelhead smolts migrate directly to the open ocean (i.e., they are not nearshore dependent) and do not rear extensively in the estuarine or coastal environments (Burgner et al., 1992).

5.3 Lower Columbia Chinook Salmon

Most Chinook in the Columbia River are “ocean-type” and migrate to the marine environment during their first year (Myers et al. 1998). They may enter estuaries immediately after emergence as fry from March to May or they may enter the estuaries as fingerling smolts during May and June of their first year (Healey, 1982). Chinook use estuaries as rearing areas and are the most dependent of all salmon species on estuaries for survival. The shorelines along the Lewis River are in generally good condition for salmonid habitat. As they grow and move into neritic habitats, they feed on decapod larvae, larval and juvenile fish, drift insects, and euphausiids (Simenstad et al., 1982)

5.4 Columbia River Chum Salmon

The Columbia River Chum Salmon primarily inhabits the lower reaches of the Columbia River and its tributaries. Chum salmon prefer shallow streams with gravel bottoms for spawning. The gravel size is important as it allows for good water flow, which provides oxygen to the eggs. They typically spawn in the lower sections of rivers and streams, often near the river mouth where freshwater meets saltwater. After hatching, chum salmon fry quickly move downstream to estuarine and nearshore environments. These areas provide a rich feeding ground and a transitional habitat between freshwater and the open ocean. Adult chum salmon are known for their wide-ranging habits in the open ocean. In the ocean, they feed on a variety of prey including zooplankton, small fish, and squid, which are abundant in the cold, nutrient-rich water of the Pacific Ocean.

5.5 Columbian White-tailed Deer

Columbian white-tailed deer are a subspecies of white-tailed deer native to the Columbia River basin and generally distinguished by their longer tail that is brown rather than black. Mature deer are medium sized with a distinctive white underside to their tail, which they raise as a warning signal when alarmed. Adult males are identified by their antlers with prongs arising from a single main beam then narrowly spreading and curving steeply upward. Widespread hunting has reduced the population of Columbian white-tailed deer throughout the last century. They have grown to adapt to many different habitats including forests, swamps, and marshes. Breeding usually occurs in the fall, with fawns born in the late spring or early summer after a gestation period of about seven months.

5.6 Bull Trout

The bull trout population is thought to contain the only anadromous forms of bull trout in the contiguous United States (Federal Register / Vol. 64, No. 210 / 1999). Spawning occurs typically from August to November in streams and migration to the open sea (for anadromous populations) takes place in the spring. Following this season, Bull Trout migrate to freshwater river systems to overwinter. Bull trout prefer colder water temperatures than most salmonids, and clean water substrates for spawning and rearing. They require complex habitats such as streams with riffles, deep pools, and undercut banks. Their critical habitat was designated for the bull trout was designated on November 17, 2010 (Federal Register, 2016).

5.7 Yellow-Billed Cuckoo

The yellow-billed cuckoo is a relatively large riparian bird that is distributed throughout the U.S., however, due to reductions in habitat, are very rare in Washington State (WDFW, 2024). Breeding season typically occurs in late spring to early summer. During this period, they tend to move around and have large home ranges but are mostly found in areas with more than 200 acres of deciduous forests (USFWS, 2024). Nesting habitat usually occurs at lower elevation riparian woodlands that contain willow trees, alders, or cottonwoods that are close to streams or rivers. Though there are no recent documents of yellow-billed cuckoo nesting in Washington, it can occur anywhere in the state as much would be considered generally good habitat for nesting.

5.8 Eulachon

Eulachon are an anadromous smelt in the family Osmeridae and are distinguished from other osmerids by having 4–6 gill rakers on the upper half of the gill arch (others have 8–14 gill rakers) and distinct concentric striations on the operculum and suboperculum (gill plate). Juvenile Eulachon disperse from rivers within their first year of life to open marine waters near the bottom at depths of 50-200m (NOAA, 2023). They spend about 95 percent of their life at sea, returning to spawn in the lower portions of coastal rivers that are fed by snow-melt or glacial run off. Eulachon range from northern California to the southeastern Bering Sea coast of Alaska (NOAA, 2023). Spawning typically occurs at ages 2-5 and on a consistent, yearly basis between December-June, when river temperatures are colder. Although eulachon abundance in monitored rivers improved in the 2013–2015 return years, sharp declines in eulachon abundance occurred in monitored rivers in 2016–2018 (NOAA, 2023). Eulachon are usually found to occupy marine water nearshore to approximately 1,000 feet depth. Critical habitat for eulachon has been designated in Lewis River, east of the proposed project location.

6 EFFECTS ANALYSIS

This section describes potential direct, indirect, and interrelated-interdependent effects of the proposed action on listed species and habitats. Potential disturbances caused by project activities are presented along with measurable indicators of habitat health.

6.1 Direct Impacts

Construction activities will likely have temporary direct impacts on habitat through reductions in overall habitat quality for shorebirds, small mammals, fish, and any invertebrates/amphibians in the area. No habitat known to be

used by any listed or sensitive species will be directly affected. The repair will be located landward of the OHWM; therefore no additional nearshore habitat will be impacted.

6.2 Indirect Impacts

Likely indirect effects of the proposed action on listed species may include temporary behavioral responses to non-injurious noise from construction activities. Physical elements of habitat will not be significantly affected by the proposed action. Should ESA listed species be present they may experience some energetic cost from dispersal of prey, resulting in short-term expenditure of energy seeking other sources or browsing while waiting for prey to re-aggregate following noise effects.

6.3 Cumulative Impacts

This section discusses how activities associated with the project will contribute to improvement, maintenance, or degradation of habitats used by ESA listed species in the project area. Potential disturbances caused by project activities are presented along with measurable indicators of habitat health. Net effect is considered to be the overall effect on the species and habitat in the long term. If short term adverse conditions occur when few or no listed species are present in the action area, and if those conditions are no longer present when listed species return to the area, those conditions do not constitute adverse modification of the indicator of habitat quality (Table 2).

Table 2. Effects of Project Activities on Habitats in the Project and Action Areas

Project Activities	Habitat Indicator	Effects of Action		
		Improve ¹	Maintain ²	Degrade ³
Construction Disturbances	Noise		X	
	Entrainment		X	
	Stranding		X	
Water Quality Disturbance	Turbidity		X	
	Chemical Contamination/Nutrients		X	
	Temperature		X	
	Dissolved Oxygen		X	
Sediment Disturbance	Sedimentation Sources/Rates		X	
	Sediment Quality		X	
Habitat Disturbance	Fish Access/Refugia		X	
	Depth		X	
	Substrate		X	
	Slope		X	
	Shoreline		X	
	Riparian Conditions		X	
	Flow and Hydrology/Current Patterns/ Saltwater-Freshwater Mixing Patterns		X	
	Overwater Structures		X	
	Impervious Surface		X	
Biota Disturbance	Prey		X	
	Infauna		X	
	Aquatic/Wetland Vegetation		X	
	Nonindigenous Species		X	
	Ecological Diversity		X	

1. Action will contribute to long-term improvement, over existing conditions, of the habitat indicator.

2. Action will maintain existing conditions.

3. Action will contribute to long-term degradation, over existing conditions, of the habitat indicator.

7 DETERMINATION OF EFFECT

The effects determination is the conclusion of the analysis of potential direct or indirect effects of the proposed activity on listed species and critical habitat. The conclusions that could result from the effects analysis for the effects determination include:

- **No Effect.** The appropriate conclusion when the action agency determines its proposed action will not affect listed species or critical habitat.
- **May Affect, is Not Likely to Adversely Affect.** The appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects on the species. Insignificant effects relate to the size of the impact and should never reach the scale at which take occurs. Discountable effects are those extremely unlikely to occur. Using best judgment, a person would not (1) be able to meaningfully measure, detect, or evaluate insignificant effects or (2) expect discountable effects to occur.
- **May Affect, is Likely to Adversely Affect.** The appropriate conclusion if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not discountable, insignificant, or beneficial (see definition of “may affect, is not likely to adversely affect”).

A key factor in making an effect determination and distinguishing between a significant and insignificant effect is determining whether the effect would be significant enough to cause a take. A summary is provided in Table 3 below.

Table 3. Summary of Proposed Action Effects on ESA Listed Species and Their Critical Habitat

Species	Listing Status	Agency	Species Effects Determination	Critical Habitat in Action Area	Critical Habitat Effects Determination
Steelhead Trout (<i>Oncorhynchus mykiss</i>)	Threatened	NMFS	No effect	No	--
Coho Salmon (<i>Oncorhynchus kisutch</i>)	Threatened	NMFS	No Effect	No	--
Lower Columbia River Chinook Salmon (<i>Oncorhynchus tshawytscha</i>)	Threatened	NMFS	No Effect	No	--
Columbia River Chum Salmon (<i>Oncorhynchus keta</i>)	Threatened	NMFS	No Effect	No	--
Columbian White-tailed Deer (<i>Odocoileus virginianus leucurus</i>)	Threatened	USFWS	No Effect	No	--
Bull Trout (<i>Salvelinus confluentus</i>)	Threatened	USFWS	No Effect	No	--
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Endangered	USFWS	No Effect	No	--
Eulachon (<i>Thaleichthys pacificus</i>)	Threatened	NMFS	No Effect	No	--

Based on the guidance and definitions provided above, the project will have **no effect** the critical habitat of the below-mentioned ESA listed species due to work being conducted from the intertidal zone during low tide. Conservation measures employed during construction are expected to maintain aquatic habitat at the baseline condition for the long-term. No adverse indirect, interrelated, and/or interdependent effects of the action are identified. The species are unlikely to be present in the action area due to a restraint of accessibility to the area. No in-water work will occur. Therefore, the effect determination is that this project will have **no effect** on the following aquatic species:

- Bull trout (*Salvelinus confluentus*)
- Steelhead trout (*Oncorhynchus mykiss*)
- Lower Columbia River Chinook Salmon (*Oncorhynchus tshawytscha*)
- Columbia River Chum Salmon (*Oncorhynchus keta*)

The subject parcel does not contain habitat that yellow-billed cuckoo (*Coccyzus americanus*) prefer. Additionally, nesting sites for this species have not been noted in Washington for several years. It is very unlikely that these species would be present in the action area due to this. Therefore, this project will have **no effect** on yellow-billed cuckoo.

The proposed work will have **no effect** on eulachon (*Thaleichthys pacificus*) due to the unlikely occurrence of the species in the project area. Eulachon may be present in Lewis River, allowing the species to potentially inhabit Horseshoe Lake through the 16" culvert that connects the water bodies. However, eulachon spend 95% of their life at sea, and Horseshoe Lake does not exhibit the preferred coastal river habitat for juvenile eulachon. Therefore, it is expected that the project, with conservation measures in place, will have a **no effect** determination on eulachon.

7.1 Mitigation Sequencing

The follow section addresses mitigation sequencing per Section 4.4 of the Critical Areas Regulations set forth in the City of Woodland's SMP.

7.1.1 Avoid

ALTERNATIVE 1: DO NOTHING

The current retaining wall has experienced deterioration from upland drainage issues. If no action is taken, the wall will eventually fail, risking the stability of the slope and safety of upland structures. In order to avoid the retaining wall being undermined and inevitably failing, the failing portion will need to be reinforced with additional support.

ALTERNATIVE 2: FULL REPLACEMENT

A repair to the existing retaining wall was selected over a full replacement because it was deemed less impactful to the critical area. A full replacement would result in additional ground disturbances and could disturb other structures such as the existing dock. This alternative was not considered feasible, at this time, due to the additional impacts and costs associated with the construction.

7.1.2 Minimize

In order to minimize potential impacts to listed species and habitat associated with this project, the following conservation measures are recommended by Facet for implementation at the site.

1. Construction timing will adhere to the work window provided by WDFW to ensure limited impact to aquatic species.
2. All work on the retaining wall will be completed by equipment operating after water has receded below the retaining wall. No in-water work will occur.
3. All construction debris will be collected and not allowed to reenter waters of the state.

4. If debris or spill material accidentally enters the waterway, immediate actions will be taken to remove the material, and the proper entities will be notified.
5. Care will be taken in all work to prevent debris, oils, and grease from entering the water.
6. All debris or spill material will be properly disposed of at an approved off-site disposal facility.
7. Should heavy equipment be needed, refueling will be conducted away from the shoreline in accordance with the Washington State Department of Ecology.
8. All equipment will be checked daily for leaks and any necessary repairs will be made prior to commencement of work.

7.1.3 Rectify

The work area will be restored back to its original condition after construction concludes.

7.1.4 Reduce

The proposed repair had been designed to withstand the upland drainage volumes per the engineer's recommendations. This will reduce the future maintenance needs for the retaining wall.

7.1.5 Compensate

There will be no long-term impacts to the shoreline. If any vegetation is removed during excavation, it will be replaced with native plantings to compensate for the impact.

7.1.6 Monitor

If native plantings are used to mitigate removed vegetation, monitoring will be required the first year following planting. Monitoring reports will document milestones, successes, problems and failures and contingency actions to compensate for mitigation shortfalls. Monitoring of plantings requires annual inspections for a minimum of 5 years following installation. Annual inspections will be performed during the growing season of each year.

8 REGULATORY SUMMARY

The project will be carried out on a privately owned parcel located in the City of Woodland and will not include work waterward of the OHWM. Agencies that will have jurisdiction and will require protection measures include the City of Woodland, the Department of Fish and Wildlife, and the Department of Ecology.

9 CRITICAL AREAS CONCLUSION

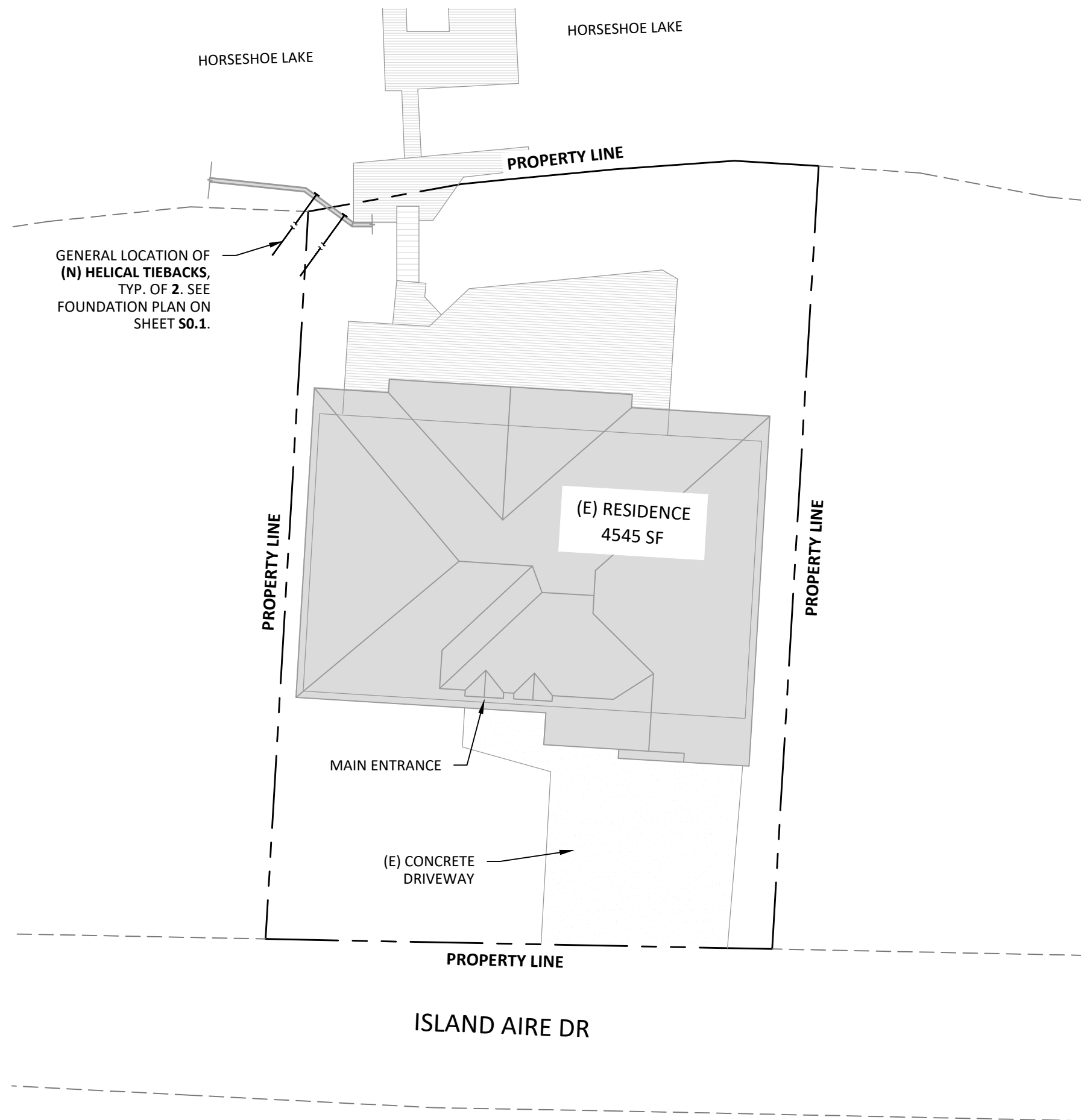
Based on the analysis of this document, the project development of the retaining wall repair with carbon armoring for additional support will not result in a significant direct impact to the shoreline critical habitat. There will be temporary impacts from minor excavation, however, the project site will be restored to pre-existing conditions after the repair is complete. BMPs shall remain in place until construction activities subside, and all disturbed areas are stabilized. This will ensure that impacts, such as runoff, do not occur and disturb the adjacent critical areas discussed above. The discussion areas above conclude that all species were given a no effect determination.

Within the limitations of schedule, scope of work, and seasonal constraints, Facet warrants that this study was conducted in accordance with generally accepted investigation practices, including the technical guidelines and criteria in effect at the time this study was performed.

10 REFERENCES

- Cornell Lab of Ornithology. All About Birds. Yellow-billed Cuckoo. Accessed 2023 via https://www.allaboutbirds.org/guide/Yellow-billed_Cuckoo/id
- Department of Ecology. Washington State Water Quality Atlas. 2023. Accessed via <https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx?CustomMap=y&RT=1&Layers=30&Filters=n,y,n,n&F2.1=0&F2.2=0&BBBox=-14338616,5395963,-12562831,6503994>
- Department of Natural Resources. Natural Heritage Program Mapper. 2023. Accessed via <https://wadnr.maps.arcgis.com>.
- Clark County Environmental Interactive Map. 2023. Accessed via <https://gis.clark.wa.gov/maponline/index.cfm?site=Environmental&ext=1>
- Woodland Municipal Code (WMC). 2024. Accessed via https://library.municode.com/wa/woodland/codes/code_of_ordinances?nodeId=16708
- Soil Survey of Clark County Washington. Accessed 2023. https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/washington/islandWA2010/IslandWA.pdf
- U.S. Department of Agriculture. Farm Service Agency (FSA). 2020. Primary Nesting Season Dates and Duration. Accessed via https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdfiles/Conservation/PDF/Primary%20Nesting%20Season_June_16_2020.pdf
- U.S. Department of Agriculture. Natural Resources Conservation Service (NRCS) Web Soil Survey. 2023. Accessed via <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>
- U.S. Fish and Wildlife Service (USFWS). 2023. National Wetlands Inventory (NWI) Surface Waters and Wetlands. Accessed via www.fws.gov/wetlands/data/mapper.html
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) mapping tool. 2023. Access via <http://apps.wdfw.wa.gov/phsontheweb/>
- WDFW. Priority Habitats and Species (PHS) Interactive Mapping. Accessed 2023. <https://wdfw.wa.gov/mapping/phs/>
- WDFW. Horseshoe Lake (Cowlitz County). Accessed 2024. <https://wdfw.wa.gov/fishing/locations/lowland-lakes/horseshoe-lake-cowlitz>
- USDA. U.S. Department of Agriculture. Reading the Foodscape: Advances in White-Tailed Deer Habitat Management. Accessed 2024. <https://www.fs.usda.gov/research/nrs/products/rooted-research/reading-foodescape-advances-white-tailed-deer-habitat-management>
- United States. National Marine Fisheries Service. West Coast Region (2022). 2022 5-Year Review: Summary & Evaluation of Lower Columbia River Chinook Salmon, Columbia River Chum Salmon, Lower Columbia River Coho Salmon, and Lower Columbia River Steelhead. <https://doi.org/10.25923/431f-fc96>

Appendix I – Site Plan



FLEISCHMAN RETAINING WALL REPAIR

354 ISLAND AIRE DR.,
WOODLAND, WA 98674

IMPERVIOUS AREA

DRIVEWAY/PATIO:	1193 SF
ROOF AREA:	4529 SF
TOTAL	5722 SF

LOT AREA

TOTAL	0.25 ACRES
-------	------------



VISTA
-STRUCTURAL-
ENGINEERING, LLC

11575 SW PACIFIC HWY # 2262, TIGARD, OR 97225
OFFICE: 971.233.6099 * MOBILE: 971.233.6099 *
* DENNIS@VISTASTRUCTURAL.COM * VISTASTRUCTURAL.COM

CLIENT: TERRAFIRMA FOUNDATION SYSTEMS

JOB TITLE: FLEISCHMAN FOUNDATION REPAIR

JURISDICTION: CITY OF WOODLAND

354 ISLAND AIRE DR., WOODLAND, WA 98674

DRAWING TITLE

SITE PLAN

ENGINEER:	AT	CHECKED BY:	DMH
DATE:	10-24-2023	DRAWN BY:	AG

SHEET NUMBER

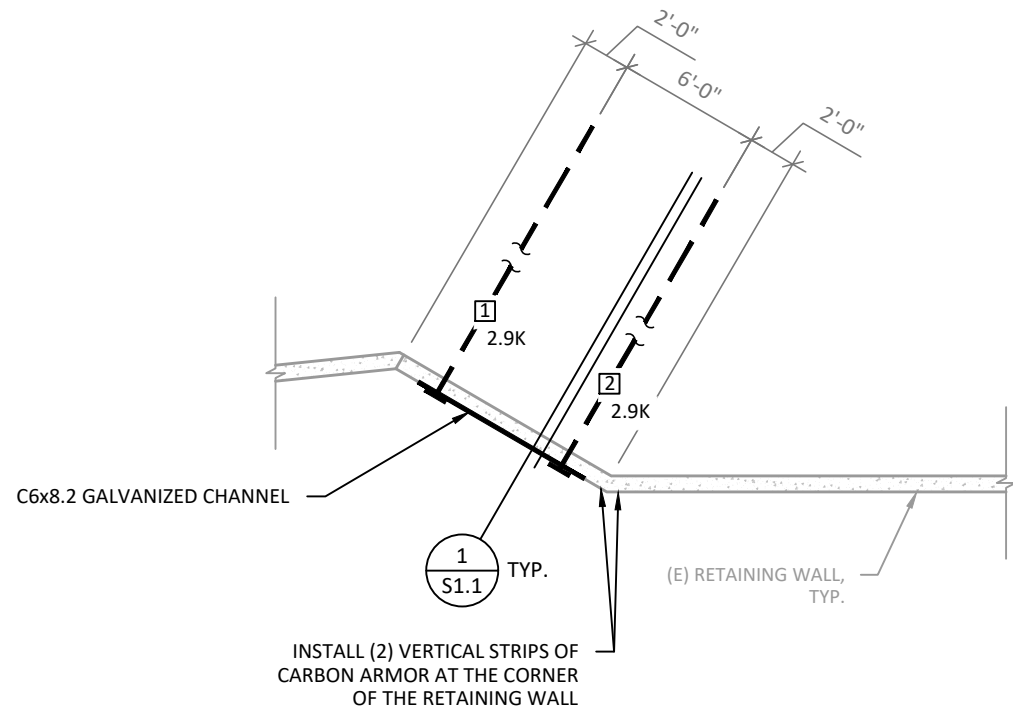
C0.0

1
C0.0

OVERALL SITE LAYOUT

1" = 20'-0"





1
S0.1

RETAINING WALL REPAIR PLAN

1/8" = 1'-0"

SPECIAL NOTE:
THE HELICAL ANCHORS SHOWN ARE TO BE VOLUNTARILY INSTALLED TO PREVENT AND STABILIZE FURTHER SUBSIDENCE OF THE EXISTING BUILDING.

(E) FOUNDATION/(N) PIER LAYOUT PLAN NOTES

1. CONTRACTOR TO NOTIFY EOR OF DISCREPANCIES BETWEEN FIELD CONDITIONS AND THOSE SHOWN IN THESE DOCUMENTS PRIOR TO CONSTRUCTION/INSTALLATION OF PIERS TYP.
2. XX K
IN ADDITION TO THE GENERAL NOTES & SPECIFICATIONS DETAILED IN THIS PLAN SET, ALL WORK & MATERIALS SHALL CONFORM TO THE 2018 INTERNATIONAL RESIDENTIAL CODE W/ WASHINGTON STATE AMENDMENTS, AS ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
3. INDICATES HELICAL TIEBACKS AND DESIGN LOAD (KIPS).
4. ALL PILES, HELICAL BLADES, CARBON ARMOR, FOUNDATION BRACKETS, HARDWARE, ETC., SHALL BE MANUFACTURED BY SUPPORTWORKS, INC.
5. **HELICAL TIEBACK INSTALLATION NOTES**
 - **HP288** (2.875"Ø (O.D.) x 0.276" THICK WALL)
 - 0.38" THICK **10/12"** HELIX CONFIGURATION w/ 1/4" FILLET WELDS EACH SIDE OF HELIX TO PIER
 - MINIMUM **15'-0"** INSTALLATION DEPTH REQUIRED AND FINAL INSTALLATION TORQUE OF **1,500 FT-LB.**
7. HELICAL TIEBACK AND CARBON ARMOR SPACING SHALL BE INDICATED ON PLAN.
8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY ALL UTILITIES AND PROTECT AS REQUIRED DURING THE COURSE OF CONSTRUCTION.
9. SEE SHEET **S0.0** FOR ADDITIONAL NOTES.



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TERRAFIRMA FOUNDATION SYSTEMS
FLEISCHMAN FOUNDATION REPAIR
354 ISLAND AIRE DR., WOODLAND, WA 98674

CLIENT:
JOB TITLE:
JURISDICTION: CITY OF WOODLAND

DRAWING TITLE
FOUNDATION PLAN

ENGINEER:	AT	CHECKED BY:	DMH
DATE:	10-24-2023	DRAWN BY:	AG

SHEET NUMBER






S0.1

Appendix II – Critical Area Review



May 24, 2024

Wetlands

- | | | |
|--|---|--|
|  Estuarine and Marine Deepwater |  Freshwater Emergent Wetland |  Lake |
|  Estuarine and Marine Wetland |  Freshwater Forested/Shrub Wetland |  Other |
| |  Freshwater Pond |  Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Flood Hazard Layer FIRMMette



122°44'59"W 45°54'10"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) Zone A, V, A99	With BFE or Depth Zone AE, AO, AH, VE, AR	Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X	Future Conditions 1% Annual Chance Flood Hazard Zone X	Area with Reduced Flood Risk due to Levee. See Notes. Zone X	Area with Flood Risk due to Levee Zone D

OTHER AREAS	NO SCREEN	Area of Minimal Flood Hazard Zone X	Effective LOMRs	Area of Undetermined Flood Hazard Zone D

GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer	Levee, Dike, or Floodwall

OTHER FEATURES	20.2	17.5	Cross Sections with 1% Annual Chance Water Surface Elevation	Coastal Transect	Base Flood Elevation Line (BFE)	Limit of Study	Jurisdiction Boundary	Coastal Transect Baseline	Profile Baseline	Hydrographic Feature

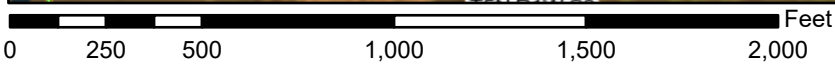
MAP PANELS	Digital Data Available	No Digital Data Available	Unmapped

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 5/15/2024 at 11:42 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.



1:6,000

122°44'21"W 45°53'45"N

Basemap Imagery Source: USGS National Map 2023



Priority Habitats and Species on the Web



Buffer radius: 200 Feet

Report Date: 05/14/2024

PHS Species/Habitats Overview:

Occurrence Name	Federal Status	State Status	Sensitive Location
Oak Woodland	N/A	N/A	No
Big brown bat			Yes

PHS Species/Habitats Details:

Oak Woodland	
Priority Area	Habitat Feature
Site Name	City of Woodland Oak Woodland Flag
Accuracy	NA
Notes	General location of Oak Woodlands. Confirm or refute with site-scale info. WDFW recommends using site-scale info to inform site-scale land use decisions. Expect that on-the-ground conditions (e.g., boundaries) will vary from the map.
Source Record	920887
Source Name	Folkerts, Keith WDFW
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS LISTED OCCURRENCE
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00030
Geometry Type	Polygons

Oak Woodland	
Priority Area	Habitat Feature
Site Name	City of Woodland Oak Woodland Flag
Accuracy	NA
Notes	General location of Oak Woodlands. Confirm or refute with site-scale info. WDFW recommends using site-scale info to inform site-scale land use decisions. Expect that on-the-ground conditions (e.g., boundaries) will vary from the map.
Source Record	920887
Source Name	Folkerts, Keith WDFW
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS LISTED OCCURRENCE
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00030
Geometry Type	Polygons

Big brown bat	
Scientific Name	<i>Eptesicus fuscus</i>
Notes	This polygon mask represents one or more records of the above species or habitat occurrence. Contact PHS Data Release at phsproducts@dfw.wa.gov for obtaining information about masked sensitive species and habitats.
PHS Listing Status	PHS Listed Occurrence
Sensitive	Y
Display Resolution	TOWNSHIP
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00605

DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necessary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.

Water Quality Atlas



Assessed Water/Sediment

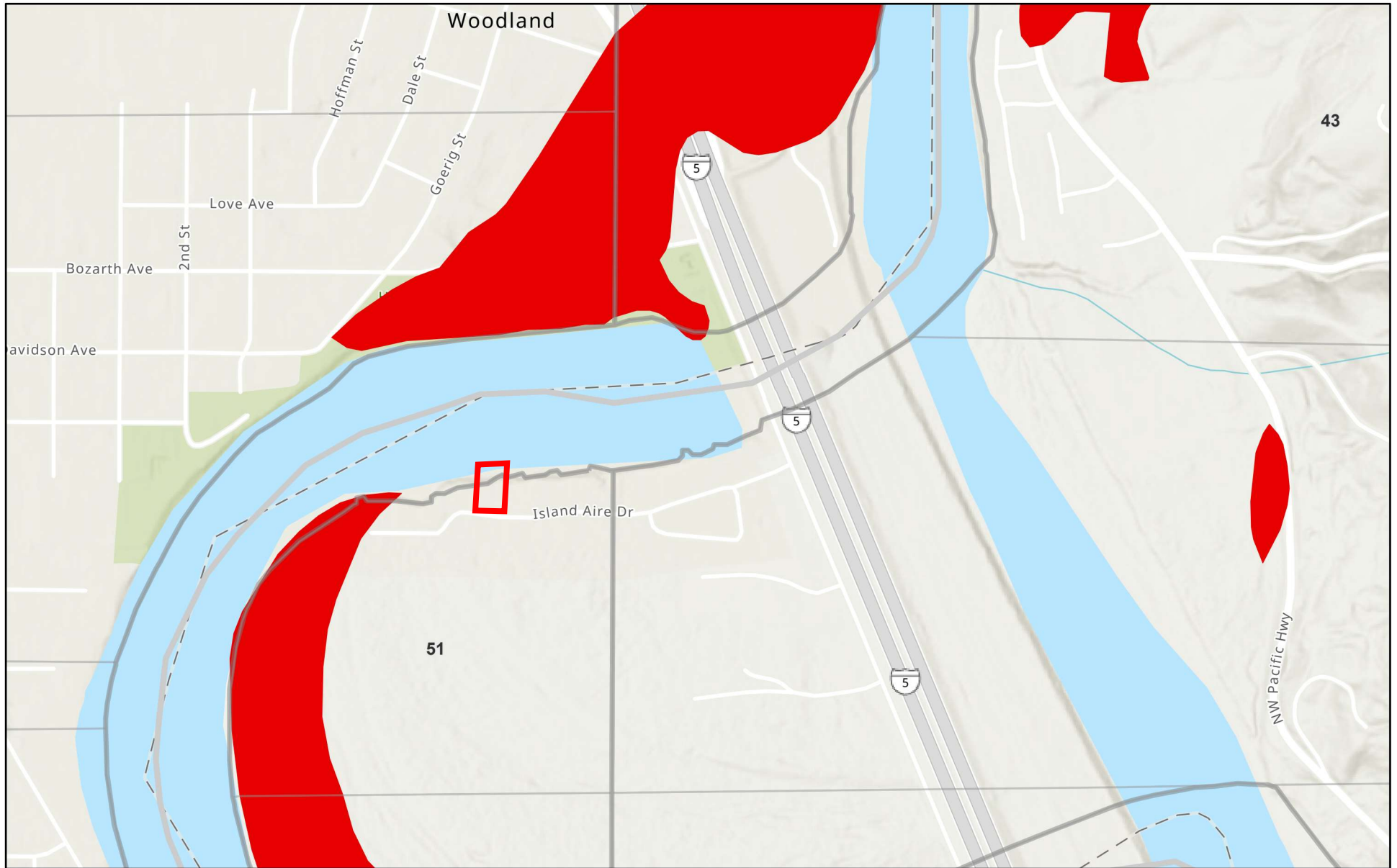
Water

- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Sediment

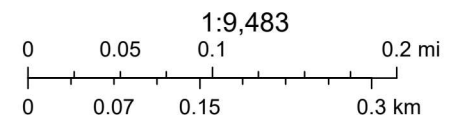
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

WNHP Rare Plant and Ecosystem Locations



5/14/2024, 5:11:52 PM

- Public Land Survey Sections
- Public Land Survey Townships
- State Boundary
- County Boundaries
- Soils - Hydic



Esri Community Maps Contributors, County of Clark, WA, Oregon State Parks, State of Oregon GEO, WA State Parks GIS, Esri, TomTom, Garmin,

WNHP Plant & Ecosystem Map Viewer





KNOWN PLANT AND ECOSYSTEM LOCATIONS REFLECT KNOWN OCCURRENCE LOCATIONS BUT MAY NOT REFLECT ALL OCCURRENCES OF RARE PLANTS OR ECOSYSTEMS.

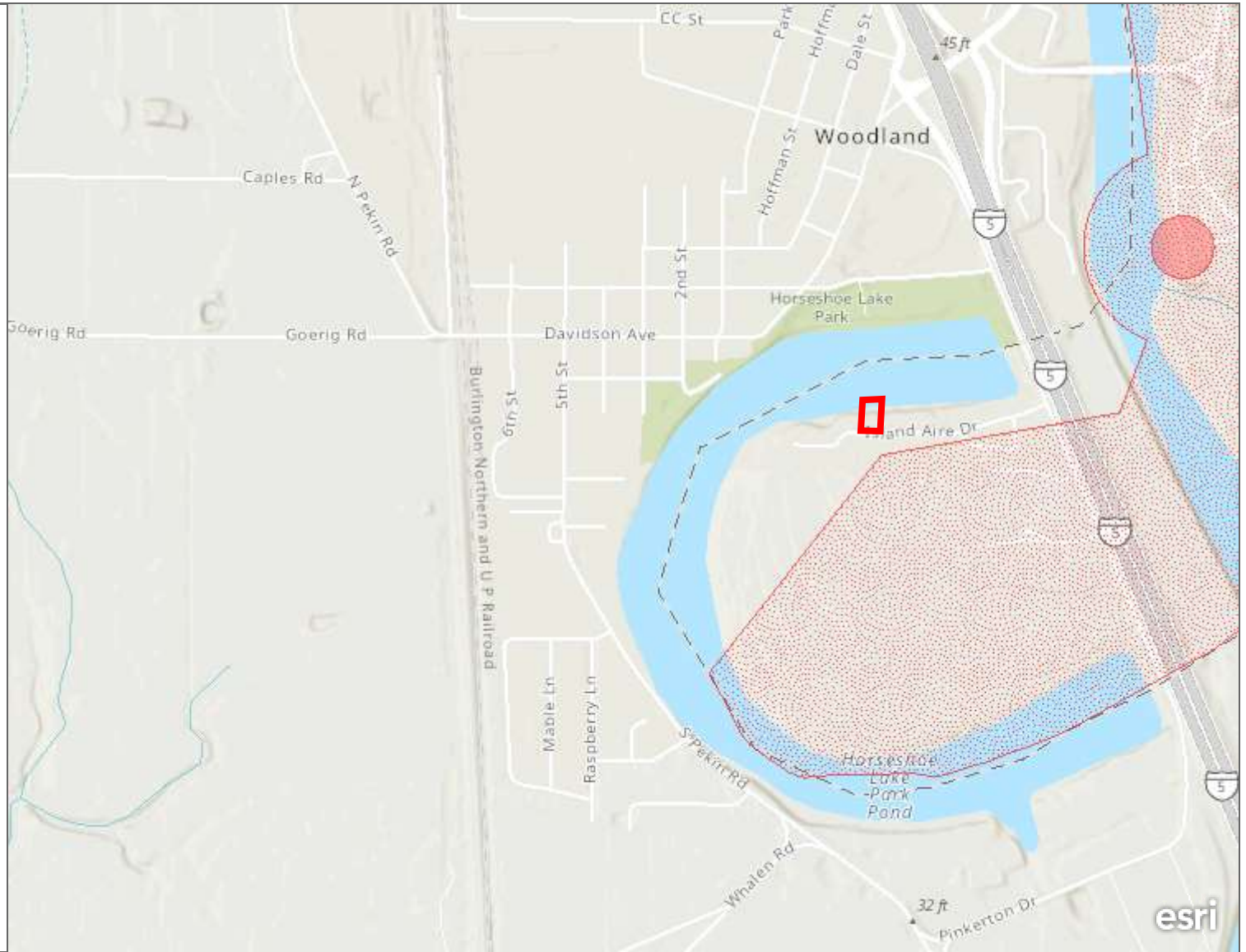
My Map

Critical Aquifer Recharge Area

Critical Aquifer Recharge Area

AQUIFER

-  Category 1 Recharge Areas
-  Category 2 Recharge Areas
-  Within 1000 foot buffer
-  Within 1900 foot buffer



0.2mi

Appendix V – Photo Log



FACET

Image 1. View of overall project site and degraded wall section to the right of the deck.



Image 2. C-Channel Helical Anchors to be installed at the green line.





Image 3. Concrete retaining wall with view of section that is failing and needs additional support.



Image 4. Existing riparian conditions along shoreline.





FACET

Image 5. Area where carbon armor will be installed outlined in green

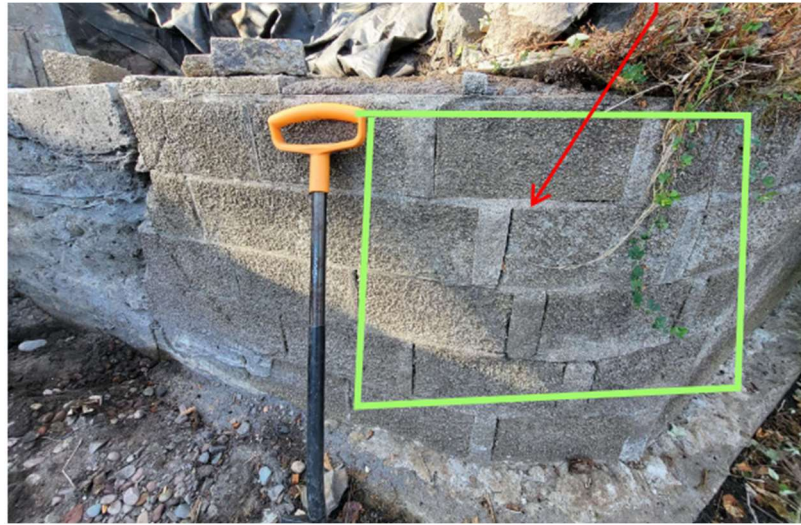


Image 6. Retaining wall section with view of shoreline





Appendix VI – Author Qualifications



Allison (Martin) Lisi, Ecologist

Professional Experience: 9 years

Allison Lisi is an Ecologist for Facet. Allison provides a wide range of consulting experience in environmental compliance, permitting, planning, restoration, and management. She has worked on a variety of habitat restoration projects throughout the Midwest, Tennessee, and Washington.

Allison earned a Bachelor of Science degree in Biology and Environmental Studies from the University of Cincinnati. She holds credentials as an ISA Certified Arborist and a Qualified Hydrologic Professional In-Training. Allison has also completed her certification in wetland delineations and watershed management.

Hilary Hahn, Environmental Coordinator

Hilary Hahn is an Environmental Coordinator for Facet with ten years of experience in the engineering, development, and surveying sector. Hilary is currently pursuing a bachelor's degree in environmental science, where she has demonstrated an understanding of key environmental principles, such as biodiversity conservation, ecological systems, and environmental policy. Her studies have also exposed her to various scientific research techniques and methodologies, further fueling her drive to find innovative solutions to pressing environmental challenges.

Hilary is currently a certified wetland delineator and is looking forward to continuing her education by obtaining advanced credentials and professional certifications in the environmental field.