

SR 104 AND 40TH PLACE NE ROUNDABOUT LAKE FOREST PARK

Critical Areas Report

Prepared for
City of Lake Forest Park
Public Works Department

July 2022, Revised February 2025



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SR 104 AND 40TH PLACE NE ROUNABOUT LAKE FOREST PARK

Critical Areas Report

1.0 Project Authorization and Scope of Work

The City of Lake Forest Park (City) proposes to construct a four-leg single-lane roundabout at the intersection of State Route 104 (SR 104) and 40th Place NE in Lake Forest Park. SR 104 is also known as Ballinger Way NE. The project will improve vehicular/pedestrian safety issues and traffic conditions within the existing intersection alignment. At the request of the City, Environmental Science Associates (ESA) prepared this Critical Areas Report (CAR), reviewed the study area per the scope of work, identified and delineated critical areas, and prepared this report in support of the project. The study area includes all critical areas within 350 feet of the project footprint. This report does not include discussion of impacts or mitigation, although regulatory issues are preliminarily addressed to provide background and potential next steps. A complete report detailing specific impacts on critical areas and a compensatory mitigation plan will be prepared if directed by the City.

This CAR is organized to meet City requirements described in the Lake Forest Park Municipal Code (LFPMC) 16.16 – Environmentally Critical Areas. The report provides an overview of the project, describes mapped critical areas, presents the results of a field investigation conducted by ESA, and documents potential regulatory implications associated with identified ecological critical areas. Geological critical areas (such as seismic and erosion hazards, critical aquifer recharge areas, and channel migration hazard areas) are not addressed in this report.

2.0 Project Description and Location

2.1 Project Description

The project will construct a four-leg single-lane roundabout at the intersection of SR 104 and 40th Place NE in Lake Forest Park (**Figure 1**). Currently, the skewed intersection has stop control at the southbound (40th Place NE) and westbound (NE 184th Street) approaches. The roundabout will include pedestrian crossings at all legs, improve traffic flow and sight distance through the intersection, and allow for clear delineation for both vehicles and pedestrians. After construction is complete, southbound SR 104 traffic will turn right at the roundabout, and northbound SR 104 traffic would turn left. Each of the properties adjacent to the project footprint will maintain one point of access in and out of their driveway from SR 104 in both directions. The project also includes utility upgrades or replacements, new illumination, and retaining walls to minimize

impacts on right-of-way and critical area buffers. The project will improve vehicular and other safety issues related to the existing intersection alignment and lack of sight distance, bike lanes, and sidewalks.

2.2 Project Location and Study Area

The study area lies within the lands of the Coast Salish Tribes, where members of the Tulalip, Snohomish, Stillaguamish, and Sauk-Suiattle people lived in their ancestral lands for thousands of years before exploration and settlement by non-Indigenous peoples.

The study area includes the construction footprint and any area within 350 feet of that footprint. It is located in Section 10 of Township 26 North, Range 4 East, within the in the City of Lake Forest Park, in King County (**Figure 1 in Appendix E**). The study area lies within the northern portion of Water Resource Inventory Area (WRIA) 8 (Cedar-Sammamish) within the Lyon Creek subbasin, which drains into Lake Washington. It is situated at the intersection of SR 104 and 40th Place NE on King County parcels 4019301000, 4019300980, 4019300990, 4019300335, and 4019300309. Land use in the area includes single-family residential with driveways that connect directly to SR 104. McKinnon Creek flows through the study area from east to west and is conveyed beneath SR 104 by a culvert, before eventually flowing into Lyon Creek several hundred feet southwest of the study area.

3.0 Existing Documentation

3.1 Review of Existing Documentation

Prior to conducting the field investigation, ESA reviewed available documentation to get a preliminary indication of site conditions and assess the potential for regulated critical areas to be present on site. The following documents and sources were reviewed:

- City of Lake Forest Park Interactive Maps (City of Lake Forest Park 2022).
- King County iMap (King County 2022).
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Mapper (USFWS 2022).
- National Resources Conservation Service (NRCS) United States Department of Agriculture (USDA) Web Soil Survey (NRCS 2022).
- Washington Department of Natural Resources (WDNR) Natural Heritage Program (WDNR 2022).
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) (WDFW 2022a).
- WDFW SalmonScape Mapping Application (WDFW 2022b).

Online mapping resources can indicate the potential presence of critical areas within the study area. However, these resources are not definitive and may not reflect the current site conditions.

As such, ESA fieldwork combined this research with on-site technical studies to verify the presence and extent of critical areas.

3.1.1 Wetlands and Soils

None of the reviewed sources mapped wetlands in the study area (USFWS 2022, King County 2022, City of Lake Forest Park 2022, WDFW 2022a, WDNR 2022). The NRCS maps Alderwood-Everett-Urban land complex, 0 to 60 percent slopes, as the predominant soil in the study area (NRCS 2022). This soil type has a typical profile of gravelly sandy loam at 0 to 7 inches, with very gravelly sandy loam 7 to 59 inches below ground surface. The drainage class is “moderately well drained,” typical of sites disturbed by development. This soil complex is not considered a hydric soil (NRCS 2022).

3.1.2 Streams

Multiple resources show McKinnon Creek located within the study area (USFWS 2022, King County 2022, City of Lake Forest Park 2022, WDFW 2022b). The stream flows from east to west before eventually joining Lyon Creek approximately 0.2 mile southwest of the study area. The City adopted the WDNR interim water typing classification system, which classifies McKinnon Creek as a 2P stream. A Type 2P water signifies a Type F aquatic area (LFPMC 16.16.350), meaning that the stream is known to be used by fish or meets the physical criteria to be potentially used by fish.

3.1.3 Fish and Wildlife

Although classified as a Type F stream, McKinnon Creek does not have documented presence of priority habitat for fish or protected fish species within the study area. WDFW SalmonScape maps depict five complete fish passage barriers on McKinnon Creek (WDFW 2022b). The barriers are related to the area’s urbanization, and several barriers can be attributed to culverts.

The WDFW PHS depicts an occurrence of little brown bat (*Myotis lucifugus*) in the township in which the study area is located. Little brown bat is a generalist species that occupies open forests, forest margins, open habitats, and urban areas (WDFW 2022a). Mapping indicates a low likelihood of presence in the study area due to nearby development and proximity to SR 104. Little brown bat is not a state of federally listed species, although its populations are declining due to loss of habitat.

4.0 Results of Field Investigation

ESA biologists Aaron Ellig, Professional Wetland Scientist (PWS), and Rachelle Tews evaluated the study area on May 10, 2022. Fieldwork included flagging the ordinary high water mark (OHWM) of streams and identifying and delineating wetlands within the study area. The wetland and stream assessment followed methods approved by the U.S. Army Corps of Engineers and Washington State Department of Ecology (**Appendix A**).

4.1 Wetlands

ESA identified one wetland within the study area (**Table 1**). Wetland determination data forms (**Appendix B**) and a wetland rating form (**Appendix C**) were completed for the assessed wetland (**Figure 2 in Appendix E**). Locations of the data plots are provided in **Figure 3 in Appendix E**. Project work is not anticipated to impact the wetland or its buffer. Photos are included in **Appendix D**.

TABLE 1.
SUMMARY OF WETLAND A CHARACTERISTICS

Location	Adjacent to the OHWM, on the left bank McKinnon Creek
Local Jurisdiction	City of Lake Forest Park
WRIA	8
Ecology/City Rating	IV
Buffer Width	40 feet based on implementation of mitigation measures in LFPMC 16.16.320-2; 50 feet without implementation of mitigation measures
Wetland Size	1,081 square feet (0.025 acre)
Cowardin Classification	Palustrine Emergent (PEM)
HGM Classification	Slope
Wetland Data Sheet	WLA-1W
Upland Data Sheet	WLA—1U
Dominant Vegetation	Nettle (<i>Urtica dioica</i>) FAC and field horsetail (<i>Equisetum arvense</i>) FAC; see Appendix B for data sheet.
Soils	Soils meet the criteria for sandy redox (S5); see Appendix B for data sheet.
Hydrology	Wetland hydrology indicators observed in Wetland A were saturation to the surface (A3) and high water table (A2) located 5 inches below soil surface; see Appendix B for data sheet.
Rationale for Local Rating	Wetland A was classified using the <i>Washington State Wetland Rating System for Western Washington—2014 Update</i> (Hruby 2014), which has been adopted in LFPMC 16.16.320. It received an overall score of 14 points, which includes 5 points for water quality, 6 points for hydrology, and 3 points for habitat; see Appendix C for rating form.

4.2 Streams

ESA delineated the OHWM of a portion of McKinnon Creek within the study area (**Figure 2 in Appendix E**). Field indicators used for delineation of the OHWM were scour lines, exposed roots, changes in sediment, and bankfull vegetation (**Photo 5 in Appendix D**). A tributary to Lyon Creek, McKinnon Creek likely originates about 0.5 mile east of the study area. Fed by groundwater, springs, and precipitation, the creek flows generally east to west through the study area and is conveyed beneath SR 104 via a 21-inch corrugated steel culvert (**Photo 2 in Appendix D**). On the west side of SR 104 about 40 feet west of where the creek daylights, it is again briefly diverted beneath a residential driveway rockery before eventually flowing into Lyon Creek downstream. McKinnon Creek is approximately 4 to 5 feet wide within the study area, with wetted depths of the stream above ground ranging from approximately 6 inches to 3 feet. In the study area, shrubs and trees species within the creek buffer are mostly ornamental species, including a nonnative hazelnut (*Corylus* spp.). The few native species include western redcedar

(*Thuja plicata*), bigleaf maple (*Acer macrophyllum*), and Douglas fir (*Pseudotsuga menziesii*). Dominant native herbaceous vegetation in the stream buffer includes bracken fern (*Pteridium aquilinum*), field horsetail (*Equisetum arvense*), western swordfern (*Polystichum munitum*), and water parsley (*Oenanthe sarmentosa*). There was also a high percentage of nonnative invasive species in the creek buffer, including cherry laurel (*Prunus laurocerasus*) and knotweed (*Fallopia* spp.). Sediment observed within the bed of the creek included sand and gravels, with some scouring in areas. Biologists also observed some woody debris and larger rocks present within the stream channel. As previously noted, McKinnon Creek is a Type F stream, which requires a 115-foot buffer under LFPMC 16.16.355.

5.0 Regulatory Considerations

5.1 Stream Buffer

Proposed work within the project footprint will impact portions of the buffer of McKinnon Creek. Note that no part of the proposed work would occur within McKinnon Creek, the wetland, or the wetland buffer.

The area of impact within the 115-foot stream buffer is comprised entirely of legally established and improved public roadway right-of-way for SR 104 and NE 184th Street (**Figure 2 in Appendix E**). The existing public right-of-way portion of the buffer fragments the vegetated stream buffer, serves as a substantial barrier to buffer functions, and in itself does not provide hydrologic, water quality, or wildlife functions. Given these site conditions and in accordance with the LFPMC, the City Planning Director may elect to waive the stream buffer, which currently serves as existing public right-of-way. The existing site meets the criteria for a complete buffer waiver in the code as follows:

LFPMC 16.16.355.C.4: The planning director may waive the buffer requirement if the waiver request is found to meet the following criteria:

a. The existing legal improvement creates a substantial barrier to the buffer function;

Explanation: Although some invasive and ornamental vegetation is present adjacent to the road prisms in marginal areas around the paved right-of-way that is SR 104 and NE 184th Street, most areas adjacent to the roads contain no vegetation. Therefore, no barrier from runoff, sediments, or other pollutants entering McKinnon Creek exists. SR 104 and NE 184th Street are a substantial barrier to the buffer function.

b. The interrupted buffer does not provide additional protection of the stream from the proposed development;

Explanation: Although some tree canopy exists within the interrupted buffer, there is a lack of native vegetation to protect the stream and provide fish or

wildlife habitat adjacent to the roads, and in paved areas and associated road prisms. There is no protection of the stream from proposed development.

- c. The interrupted buffer does not provide significant hydrological, water quality and wildlife buffer functions relating to the portion of the buffer adjacent to the stream.*

Explanation: Lack of vegetation, impervious surfaces, presence of traffic and residential activity, as well as the presence of nonnative and noxious weed species of plants, inhibit the interrupted buffer from providing significant hydrological, water quality, and wildlife buffer functions to the stream.

5.2 Exceptional Trees

Several trees within the study area may meet the definition of exceptional trees as defined in LFPMC 16.14.030 as such:

“Exceptional tree” means a viable tree, which because of its unique combination of size and species, age, location, and health is worthy of long-term retention, as determined by the city’s qualified arborist. To be considered exceptional, a tree must meet the following criteria:

- 1. The tree must be included in and have a diameter at breast height (DBH) that is equal to or greater than the threshold diameters listed in Table 1¹;*
- 2. The tree shall exhibit healthful vigor for its age and species;*
- 3. The tree shall not be considered a significant risk in regard to existing utilities and structures as evaluated per the tree risk assessment defined in LFPMC 16.14.080(A)(1);*
- 4. The tree shall have no visual structural defects that cannot be mitigated by one or more measures outlined in the International Society of Arboriculture Best Management Practices; and*
- 5. If retained under current tree growth conditions, the tree can be expected to remain viable with reasonable and prudent management and care.*

During the field investigation, ESA observed trees within the study area that were estimated to be equal to or greater than the 42-inch DBH threshold for bigleaf maple, Douglas fir, and western redcedar. Some trees within the study area were also observed to be over 100 feet tall, with infestations of ivy (*Hedera helix*) obscuring the majority of the trunks. Based on survey data and not on field studies, **Figure 4 in Appendix E** shows locations of trees 6 inches DBH or more (considered significant trees by the City) and 33 inches DBH or more (the exceptional tree size criteria for Grand fir [*Abies grandis*]) to anticipate the range of potential significant and exceptional trees, respectively, based only on the size criteria. ESA recommends that a certified

¹ For the purposes of this report, Table 1 from the LFPMC has been relabeled Table 2 for consistency with the remainder of this Critical Areas Report.

arborist perform a site assessment to document potential exceptional trees in consideration of the full criteria in LFPMC 16.14.030.

TABLE 2.
EXCEPTIONAL TREE SPECIES AND THEIR THRESHOLD DIAMETERS

Species	Threshold Diameter (DBH)
Bigleaf maple (<i>Acer macrophyllum</i>)	42 inches
Douglas fir (<i>Pseudotsuga menziesii</i>)	42 inches
Grand fir (<i>Abies grandis</i>)	33 inches
Madrona (<i>Arbutus menziesii</i>)	12 inches
Western hemlock (<i>Tsuga heterophylla</i>)	36 inches
Western redcedar (<i>Thuja plicata</i>)	42 inches
Western white pine (<i>Pinus monticola</i>)	36 inches

SOURCE: LFPMC 16.14.030

The project would likely require a Major Tree Permit to meet LFPMC 16.14.040 requirements, which states that no person or their representative shall remove or destroy any significant tree located within the city without first obtaining a tree permit. A Major Tree Permit is required with review by the City's arborist under the following circumstances:

- a. *When one or more landmark tree is proposed for removal;*
- b. *When three or more significant trees are proposed for removal within any 36-month period;*
- c. *When any tree proposed for removal is a protected tree or is located in an environmentally critical area or buffer;*
- d. *When any major development activity is proposed;*
- e. *When any minor development activity is proposed within the critical root zone (CRZ) of significant trees; or*
- f. *When trees are proposed for removal on a property on which major development activity has occurred within the last five years (LFPMC 16.14.040 (B) (2)).*

LFPMC 16.14.030 defines landmark trees as significant trees that are each at least 24 inches DBH. The critical root zone (CRZ) will need to be addressed and potentially analyzed by the City's arborist as part of the project, due to requirements in LFPMC 16.14.040 and as part of seeking a Major Tree Permit.

An arborist site assessment and tree replacement plan is required when applying for a Major Tree Permit, as described in LFPMC 16.14.040.C – Application Requirements. A Major Tree Permit application must show that the application satisfies or approval is conditioned to satisfy the conditions set forth in LFPMC 16.14.070. LFP 16.14.080 sets forth conditions under which

removal of trees in critical areas or their buffers are prohibited or allowed with permits. Tree replacement plans must comply with LFPMC 16.14.090.

LFPMC 16.14.060 states that tree removal permits shall not be granted if, as determined by the city's qualified arborist, (1) the removal is likely to cause injury or damage, (2) the tree(s) are viable exceptional trees, (3) if trees to be removed are located on properties that have undergone major development activity within the last five years and for which no new major development activity or minor development activity is proposed, or (4) if trees to be removed are in a tree conservation easement, unless the proposal is consistent with regulations (LFPMC 16.14.080) for tree removal in environmentally critical areas.

Facet has prepared the following studies to support the Major Tree Permit application:

- Arborist Report (Facet 2024a)
- Canopy Coverage Study (Facet 2024b)
- Right-of-Way Corridor Canopy Replacement Plan (Facet 2025)

6.0 Limitations

Within the limitations of schedule, budget, scope of work, and seasonal constraints, we warrant that this Critical Areas Report was prepared in accordance with generally accepted environmental science practices, including the technical guidelines and criteria in effect at the time this investigation was performed. The results and conclusions of this report represent the authors' best professional judgment, based on information provided by the project proponent in addition to that obtained during this study. No other warranty, expressed or implied, is made.

7.0 References

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Appendix A

Methods



Methods

Wetland Identification, Delineation, and Classification

ESA biologists delineated wetlands according to local, state, and federal guidelines within the project limits. Wetlands were delineated using the Routine Determination Method in the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region – Version 2.0 (Regional Supplement) (USACE, 2010).

Wetland delineation consisted of three main tasks: (1) assessing vegetation, soil, and hydrologic characteristics to identify areas meeting the wetland criteria; (2) evaluating any constructed drainage features to determine if they would be regulated as wetlands; and (3) marking wetland boundaries. In places that appeared to have wetland characteristics, the dominant plant species, soil conditions in test pits, and evidence of hydrologic conditions were recorded on routine data forms. Upland areas adjacent to each potential wetland area were also evaluated. Based on the field data, a wetland/non-wetland determination was made for each examined area. Following confirmation of all three wetland parameters an area, the wetland boundary was marked by placing sequentially numbered flagging along the wetland perimeter. Sample plots were marked with orange flagging labeled DP-1 and DP-2.

Biologists used several tools to identify and classify plants and soils examined within the evaluation area. The wetland indicator status and scientific names of plants were identified using the National Wetland Plant List Version 3.4. (NCRS, 2020). Soil characteristics were recorded and classified using the Field Book for Describing and Sampling Soils Version 3.0. Hydric soil conditions were assessed using Field Indicators of Hydric Soils in the United States version 8.2 (NRCS, 2018), which has been updated since a previous version's adoption as the primary hydric soil indicators within the Regional Supplement.

The wetlands delineated within the study area were classified according to federal, state, and local systems. The USFWS system (Cowardin et al., 1979) is a descriptive classification, based on physical attributes (i.e., vegetation, soils, and water regime). The Washington State Wetland Rating System for Western Washington (Rating System) categorizes wetlands into four hierarchical categories based on rarity, sensitivity to disturbance, and water quality, hydrologic, and habitat functions (Hruby, 2014). Classification ranges from Category I wetlands, which exhibit outstanding features (rare wetland type, relatively undisturbed or a high sensitivity to disturbance, and high level of functions) to Category IV wetlands, which have the lowest levels of function and are often heavily disturbed.

The City of Lake Forest Park has codified use of the 2014 wetland rating system and assigns wetland buffer widths based on wetland category, adjacent land use intensity, habitat score, and whether the wetland has special characteristics or of high conservation value. King County wetland buffers range from 25 feet to 250 feet (KCC 21A.24.325).

Wetland Functional Assessment

Wetlands perform a variety of biological, physical (hydrologic), and chemical (water quality) functions. How and to what level these functions are provided depends primarily on the hydrogeomorphic (HGM)

classification. The HGM classification is based on three fundamental factors that influence how wetlands function: position in the landscape (geomorphic setting), water source (hydrology), and the flow and fluctuation of the water once in the wetland (hydrodynamics). Functions for the wetland within the evaluation area was classified using the results from the Rating System. The Rating System first classifies a wetland's HGM and then assigns multiple aspects relating to each function type (water quality, hydrology, and habitat) a high, medium, or low level of function based on the wetland's attributes.

Aquatic Area Identification and Classification

Biologists observed and approximated the locations of rivers and streams adjacent to the evaluation area and were classified and buffers assigned according to local and state regulations. The state water typing system (WAC 222-16-030) classifies streams as S, F, Np, or Ns, depending on their “shoreline of the state” status, presence of fish habitat, annual flow rate (seasonal or perennial), and connections to other waters. Lake Forest Park assigns buffers to aquatic areas based on the water typing system. Buffer widths range from 25 to 165 feet. Biologists qualitatively evaluated riparian habitat for the streams.

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Appendix B

Wetland Data Forms



WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: LFP SR 104	City/County: King	Sampling Date: 5/10/2022
Applicant/Owner: City of Lake Forest Park	State: Washington	Sampling Point: WLA-1W
Investigator(s): Rachelle Tews	Section, Township, Range: Section 10, Township 26N, Range 4E	
Landform (hillslope, terrace, etc.): Hillslope	Local relief (concave, convex, none): Concave	Slope (%): 0
Subregion (LRR): LRR A Soil	Lat: 47.7600053616	Long: -122.283319702
Map Unit Name: Alderwood	NWI classification: None	Datum: WGS84
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If no, explain in Remarks.)		
Are Vegetation <u>no</u> Soil <u>no</u> or Hydrology <u>no</u> significantly disturbed? Are "Normal Circumstances" present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Are Vegetation <u>no</u> Soil <u>no</u> or Hydrology <u>no</u> naturally problematic? (If needed, explain any answers in Remarks.)		

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks:			

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: 30 ft/radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1.	0			Number of Dominant Species	
2.	0			That Are OBL, FACW, or FAC: 3 (A)	
3.	0			Total Number of Dominant Species Across All Strata: 3 (B)	
4.	0			Percent of Dominant Species	
	0 = Total Cover			That Are OBL, FACW, or FAC: 100 % (A/B)	
<u>Sapling/Shrub Stratum</u> (Plot size: 30 ft/radius)	0			Prevalence Index worksheet:	
1.	0			Total % Cover of: 15 Multiply by: x 1= 15	
2.	0			FACW species 0 x 2= 0	
3.	0			FAC species 125 x 3= 375	
4.	0			FACU species 0 x 4= 0	
5.	0			UPL species 0 x 5= 0	
	0 = Total Cover			Column Totals: 140 (A) 390 (B)	
<u>Herb Stratum</u> (Plot size: 5 ft/radius)	25	no	FAC	Prevalence Index = B/A = 2.79	
1. <i>Urtica dioica</i>	45	yes	FAC	Hydrophytic Vegetation Indicators:	
2. <i>Equisetum arvense</i>	35	yes	FAC	yes 1-Rapid Test For Hydrophytic Vegetation	
3. <i>Ranunculus repens</i>	15	no	OBL	yes 2-Dominance Test is >50%	
4. <i>Lysichiton americanus</i>	20	yes	FAC	yes 3-Prevalence Index is ≤3.0 ¹	
5. <i>Tolmiea menziesii</i>	0			no 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
6.	0			no 5-Wetland Non-Vascular Plants ¹	
7.	0			no 6-Problematic Hydrophytic Vegetation ¹ (Explain)	
8.	0			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
9.	0				
10.	0				
11.	0				
	140 = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: 30)	0				
1.	0				
2.	0				
% Bare Ground in Herb Stratum	0				
Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Remarks:

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 3	10YR 3/1	100	7.5YR 4/4	10	C	M	Loamy sand	
3 - 9	10YR 4/1	90	7.5YR 4/4	15	C	M	Loamy sand	
9 - 16	2.5Y 4/1	85					Loamy sand	
0 - 0		0		0				
0 - 0		0		0				
0 - 0		0		0				
0 - 0		0		0				
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Sandy Redox (S5)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**Type: _____
Depth (inches): 0Hydric Soil Present? Yes No _____

Remarks:

HYDROLOGY**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required: check all that apply)

<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> 1, 2, 4A, and 4B
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Salt Crust (B11)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Aquatic Invertebrates (B13)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators (2 or more required)

<input checked="" type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Shallow Aquitard (D3)
<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:Surface Water Present? yes
Water Table Present? yes
Saturation Present? yes
(includes capillary fringe)Depth (Inches): 1
Depth (Inches): 5
Depth (Inches): 0Wetland Hydrology Present? Yes No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: LFP SR 104	City/County: Lake Forest Park, King County	Sampling Date: 5/10/2022
Applicant/Owner: City of Lake Forest Park	State: Washington	Sampling Point: WLA-1U
Investigator(s): Rachelle Tews	Section, Township, Range: Section 10, Township 26N, Range 4E	
Landform (hillslope, terrace, etc.): Hillslope	Local relief (concave, convex, none): None	Slope (%): 2
Subregion (LRR): LRR A	Lat: 47.7600507299	Long: -122.283342535
Soil Map Unit Name: Alderwood	NWI classification: None	
Are climatic / hydrologic conditions on the site typical for this time of year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (If no, explain in Remarks.)		
Are Vegetation <u>no</u> Soil <u>no</u> or Hydrology <u>no</u> significantly disturbed? Are "Normal Circumstances" present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Are Vegetation <u>no</u> Soil <u>no</u> or Hydrology <u>no</u> naturally problematic? (If needed, explain any answers in Remarks.)		

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X
Remarks:			

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: 30 ft/radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. Acer macrophyllum	20	yes	FACU	Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)	
2.	0			Total Number of Dominant Species Across All Strata: 3 (B)	
3.	0			Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)	
4.	0				
	20	=	Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: 30 ft/radius)	0			Prevalence Index worksheet:	
1.	0			Total % Cover of: 0 Multiply by: 1= 0	
2.	0			FACW species 0 x 2= 0	
3.	0			FAC species 0 x 3= 0	
4.	0			FACU species 110 x 4= 0	
5.	0			UPL species 0 x 5= 0	
	0	=	Total Cover	Column Totals: 110 (A) 440 (B)	
<u>Herb Stratum</u> (Plot size: 5 ft/radius)	70	yes	FACU	Prevalence Index = B/A = 4	
1. Hedera helix	20	yes	FACU	Hydrophytic Vegetation Indicators:	
2. Polystichum munitum	0			no 1-Rapid Test For Hydrophytic Vegetation	
3.	0			no 2-Dominance Test is >50%	
4.	0			no 3-Prevalence Index is ≤3.0 ¹	
5.	0			no 4-Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)	
6.	0			no 5-Wetland Non-Vascular Plants ¹	
7.	0			no 6-Problematic Hydrophytic Vegetation ¹ (Explain)	
8.	0			¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
9.	0				
10.	0				
11.	0				
	90	=	Total Cover		
<u>Woody Vine Stratum</u> (Plot size:)	0			Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> X	
1.	0				
2.	0				
	0	=	Total Cover		
% Bare Ground in Herb Stratum	0				

Remarks: Ornamental Corylus

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 3/3	100		0			Loam	
6 - 16	10YR 4/3	100		0			Loamy sand	
0 - 0		0		0				
0 - 0		0		0				
0 - 0		0		0				
0 - 0		0		0				
-		0		0				

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)**

Histosol (A1)	Sandy Redox (S5)
Histic Epipedon (A2)	Stripped Matrix (S6)
Black Histic (A3)	Loamy Mucky Mineral (F1) (except MLRA 1)
Hydrogen Sulfide (A4)	Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11)	Depleted Matrix (F3)
Thick Dark Surface (A12)	Redox Dark Surface (F6)
Sandy Mucky Mineral (S1)	Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4)	Redox Depressions (F8)

Indicators for Problematic Hydric Soils³:

2 cm Muck (A10)
Red Parent Material (TF2)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**Type: _____
Depth (inches): 0Hydric Soil Present? Yes No ✓**Remarks:**

Gravel present

HYDROLOGY**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one required: check all that apply)

Surface Water (A1)	Water-Stained Leaves (B9) (except MLRA 1)
High Water Table (A2)	1, 2, 4A, and 4B
Saturation (A3)	Salt Crust (B11)
Water Marks (B1)	Aquatic Invertebrates (B13)
Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1)
Drift Deposits (B3)	Oxidized Rhizospheres along Living Roots (C3)
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)
Iron Deposits (B5)	Recent Iron Reduction in Tilled Soils (C6)
Surface Soil Cracks (B6)	Stunted or Stressed Plants (D1) (LRR A)
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Remarks)
Sparsely Vegetated Concave Surface (B8)	

Secondary Indicators (2 or more required)

Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
Drainage Patterns (B10)
Dry-Season Water Table (C2)
Saturation Visible on Aerial Imagery (C9)
Geomorphic Position (D2)
Shallow Aquitard (D3)
FAC-Neutral Test (D5)
Raised Ant Mounds (D6) (LRR A)
Frost-Heave Hummocks (D7)

Field Observations:Surface Water Present? no
Water Table Present? no
Saturation Present? no
(includes capillary fringe)Depth (Inches): 0
Depth (Inches): 0
Depth (Inches): 0Wetland Hydrology Present? Yes No ✓

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

Remarks:

Appendix C

Wetland Rating Form



RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland ADate of site visit: 10-May-22Rated by Rachelle TewsTrained by Ecology? Yes NoDate of training Mar-21HGM Class used for rating SlopeWetland has multiple HGM classes? Yes No

NOTE: Form is not complete with out the figures requested (figures can be combined).

Source of base aerial photo/map AccessibleOVERALL WETLAND CATEGORY IV (based on functions or special characteristics)

1. Category of wetland based on FUNCTIONS

- Category I - Total score = 23 - 27
- Category II - Total score = 20 - 22
- Category III - Total score = 16 - 19
- X Category IV - Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	L	L	L	
Landscape Potential	L	M	L	
Value	H	H	L	Total
Score Based on Ratings	5	6	3	14

Score for each function based on three ratings
(order of ratings is not important)

9 = H, H, H
8 = H, H, M
7 = H, H, L
7 = H, M, M
6 = H, M, L
6 = M, M, M
5 = H, L, L
5 = M, M, L
4 = M, L, L
3 = L, L, L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	Category
Estuarine	
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	Figure 1
Hydroperiods	H 1.2	N/A
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	N/A
Plant cover of dense, rigid trees, shrubs, and herbaceous plants (<i>can be added to another figure</i>)	S 4.1	N/A
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	S 2.1, S 5.1	N/A
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	Figure 2

Wetland name or number

Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	Figure 3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	Figure 4

HGM Classification of Wetland in Western Washington

For questions 1 -7, the criteria described must apply to the entire unit being rated.

If hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1 - 7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

NO - go to 2 **YES** - the wetland class is **Tidal Fringe** - go to 1.1

1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

NO - Saltwater Tidal Fringe (Estuarine) **YES - Freshwater Tidal Fringe**
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands.*
*If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it.

Groundwater and surface water runoff are NOT sources of water to the unit.

NO - go to 3 **YES** - The wetland class is **Flats**
*If your wetland can be classified as a **Flats** wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?

The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
 At least 30% of the open water area is deeper than 6.6 ft (2 m).

NO - go to 4 **YES** - The wetland class is **Lake Fringe (Lacustrine Fringe)**

4. Does the entire wetland unit **meet all** of the following criteria?

The wetland is on a slope (*slope can be very gradual*),
 The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
 The water leaves the wetland **without being impounded**.

NO - go to 5 **YES** - The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?

The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
 The overbank flooding occurs at least once every 2 years.

NO - go to 6 **YES** - The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding.

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

NO - go to 7 YES - The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO - go to 8 YES - The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number

<u>SLOPE WETLANDS</u>		
Water Quality Functions - Indicators that the site functions to improve water quality		
S 1.0. Does the site have the potential to improve water quality?		
S 1.1. Characteristics of the average slope of the wetland: (a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)		
Slope is 1% or less	points = 3	2
Slope is > 1% - 2%	points = 2	
Slope is > 2% - 5%	points = 1	
Slope is greater than 5%	points = 0	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions):		
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. <i>Dense</i> means you have trouble seeing the soil surface (>75% cover), and <i>uncut</i> means not grazed or mowed and plants are higher than 6 in.		
Dense, uncut, herbaceous plants > 90% of the wetland area	points = 6	1
Dense, uncut, herbaceous plants > 1/2 of area	points = 3	
Dense, woody, plants > 1/2 of area	points = 2	
Dense, uncut, herbaceous plants > 1/4 of area	points = 1	
Does not meet any of the criteria above for plants	points = 0	
Total for S 1	Add the points in the boxes above	3
Rating of Site Potential If score is: <input type="checkbox"/> 12 = H <input type="checkbox"/> 6 - 11 = M <input checked="" type="checkbox"/> 0 - 5 = L Record the rating on the first page		
S 2.0. Does the landscape have the potential to support the water quality function of the site?		
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?		
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?		
Other Sources	Yes = 1 No = 0	0
Total for S 2	Add the points in the boxes above	
Rating of Landscape Potential If score is: <input type="checkbox"/> 1 - 2 = M <input checked="" type="checkbox"/> 0 = L Record the rating on the first page		
S 3.0. Is the water quality improvement provided by the site valuable to society?		
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?		
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? <i>At least one aquatic resource in the basin is on the 303(d) list.</i>		
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? Answer YES if there is a TMDL for the basin in which the unit is found?		
Total for S 3	Add the points in the boxes above	4
Rating of Value If score is: <input checked="" type="checkbox"/> 2 - 4 = H <input type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L Record the rating on the first page		

Wetland name or number

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?

S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.*

Dense, uncut, rigid plants cover > 90% of the area of the wetland	points = 1	0
All other conditions	points = 0	

Rating of Site Potential If score is: 1 = M 0 = L

Record the rating on the first page

S 5.0. Does the landscape have the potential to support hydrologic functions of the site?

S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff?

Yes = 1 No = 0 1

Rating of Landscape Potential If score is: 1 = M 0 = L

Record the rating on the first page

S 6.0. Are the hydrologic functions provided by the site valuable to society?

S 6.1. Distance to the nearest areas downstream that have flooding problems:

The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)	points = 2	2
Surface flooding problems are in a sub-basin farther down-gradient	points = 1	
No flooding problems anywhere downstream	points = 0	

S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?

Yes = 2 No = 0

Total for S 6

Add the points in the boxes above

2

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L

Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

Wetland name or number

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat**H 1.0.** Does the site have the potential to provide habitat?

H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.*

- | | | |
|---|---|---|
| <input type="checkbox"/> Aquatic bed
<input checked="" type="checkbox"/> Emergent
<input type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover)
<input type="checkbox"/> Forested (areas where trees have > 30% cover)
<i>If the unit has a Forested class, check if:</i>
<input type="checkbox"/> The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon | 4 structures or more: points = 4
3 structures: points = 2
2 structures: points = 1
1 structure: points = 0 | 0 |
|---|---|---|

H 1.2. Hydroperiods

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (see text for descriptions of hydroperiods).

- | | | |
|--|--|---|
| <input type="checkbox"/> Permanently flooded or inundated
<input type="checkbox"/> Seasonally flooded or inundated
<input type="checkbox"/> Occasionally flooded or inundated
<input checked="" type="checkbox"/> Saturated only
<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland
<input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland
<input type="checkbox"/> Lake Fringe wetland
<input type="checkbox"/> Freshwater tidal wetland | 4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0 | 0 |
|--|--|---|

H 1.3. Richness of plant species

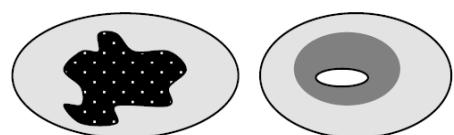
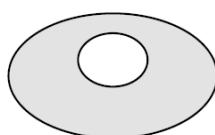
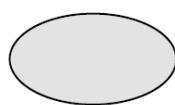
Count the number of plant species in the wetland that cover at least 10 ft².

Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

- | | |
|--|--|
| If you counted:
> 19 species
5 - 19 species
< 5 species | points = 2
points = 1
points = 0 |
|--|--|

H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*



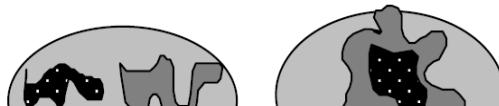
None = 0 points

Low = 1 point

Moderate = 2 points

0

All three diagrams in this row are



Wetland name or number

HIGH = 3 points



<p>H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) <input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input type="checkbox"/> At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see <i>H 1.1 for list of strata</i>) 		1
--	--	---

Total for H 1	Add the points in the boxes above	2
---------------	-----------------------------------	---

Rating of Site Potential If Score is: 15 - 18 = H 7 - 14 = M 0 - 6 = L Record the rating on the first page

<p>H 2.0. Does the landscape have the potential to support the habitat function of the site?</p> <p>H 2.1 Accessible habitat (include only habitat that directly abuts wetland unit).</p> <p>Calculate:</p> <p>10 % undisturbed habitat + (_____ 100 % moderate & low intensity land uses / 2) = 60%</p>		
If total accessible habitat is:		
> 1/3 (33.3%) of 1 km Polygon	points = 3	0
20 - 33% of 1 km Polygon	points = 2	
10 - 19% of 1 km Polygon	points = 1	
< 10 % of 1 km Polygon	points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.		
Calculate:		
10 % undisturbed habitat + (_____ 100 % moderate & low intensity land uses / 2) = 60%		
Undisturbed habitat > 50% of Polygon	points = 3	0
Undisturbed habitat 10 - 50% and in 1-3 patches	points = 2	
Undisturbed habitat 10 - 50% and > 3 patches	points = 1	
Undisturbed habitat < 10% of 1 km Polygon	points = 0	
H 2.3 Land use intensity in 1 km Polygon: If		
> 50% of 1 km Polygon is high intensity land use	points = (-2)	-2
≤ 50% of 1km Polygon is high intensity	points = 0	
Total for H 2	Add the points in the boxes above	-2

Rating of Landscape Potential If Score is: 4 - 6 = H 1 - 3 = M < 1 = L Record the rating on the first page

<p>H 3.0. Is the habitat provided by the site valuable to society?</p> <p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? Choose only the highest score that applies to the wetland being rated.</p> <p>Site meets ANY of the following criteria:</p>		points = 2
<ul style="list-style-type: none"> <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or 		

Wetland name or number

regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan

Site has 1 or 2 priority habitats (listed on next page) within 100m

points = 1

Site does not meet any of the criteria above

points = 0

Rating of Value If Score is: **2 = H** **1 = M** **0 = L**

Record the rating on the first page

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.

<http://wdfw.wa.gov/publications/00165/wdfw00165.pdf> or access the list from here:

<http://wdfw.wa.gov/conservation/phs/list/>

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: **NOTE: This question is independent of the land use between the wetland unit and the priority habitat.**

- Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.
- Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12

Wetland name or number

in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<p><i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i></p>	
SC 1.0. Estuarine Wetlands <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <p style="text-align: center;"><input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p>	<input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <ul style="list-style-type: none"> <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) <input type="checkbox"/> At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or ungrazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. 	<input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II
SC 2.0. Wetlands of High Conservation Value (WHCV) <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: center;"><input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3</p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: center;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV</p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</p> <p style="text-align: center;"><input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV</p> <p>SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?</p> <p style="text-align: center;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV</p>	
SC 3.0. Bogs <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?</p> <p style="text-align: center;"><input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2</p> <p>SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?</p> <p style="text-align: center;"><input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog</p> <p>SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?</p> <p style="text-align: center;"><input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p> <p>SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir,</p>	

western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?

Yes = Is a Category I bog

No = Is not a bog

SC 4.0. Forested Wetlands <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? If you answer YES you will still need to rate the wetland based on its functions.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. <input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). <p style="text-align: center;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>		
SC 5.0. Wetlands in Coastal Lagoons <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> <input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks <input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>) <p style="text-align: center;"><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p>		
SC 5.1. Does the wetland meet all of the following three conditions? <ul style="list-style-type: none"> <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). <input type="checkbox"/> At least $\frac{3}{4}$ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or ungrazed or un-mowed grassland. <input type="checkbox"/> The wetland is larger than $\frac{1}{10}$ ac (4350 ft²) <p style="text-align: center;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>		
SC 6.0. Interdunal Wetlands <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBBO)? If you answer yes you will still need to rate the wetland based on its habitat functions.</p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103 <input type="checkbox"/> Grayland-Westport: Lands west of SR 105 <input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109 <p style="text-align: center;"><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p>		
SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? <p style="text-align: center;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p>		
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? <p style="text-align: center;"><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p>		
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? <p style="text-align: center;"><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>		
Category of wetland based on Special Characteristics <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>		



SOURCE: Maxar, ESA, 2022.



Emergent Vegetation
and Saturated Only
Wetland A

Figure 1
Wetland A Rating Figures



SOURCE: ESA, 2022.



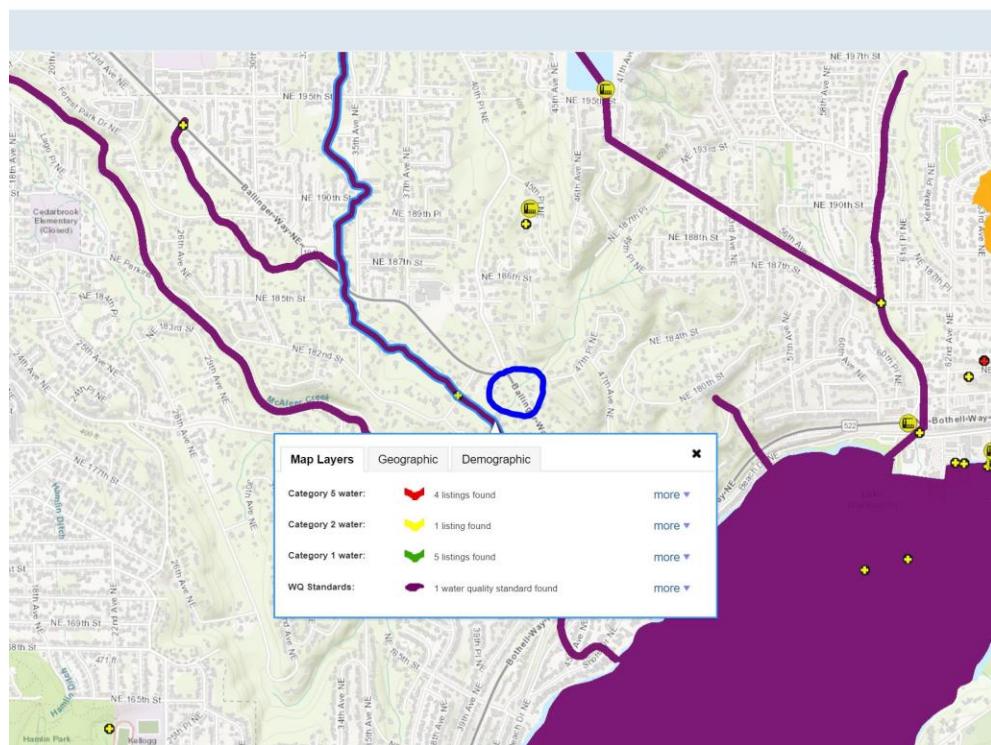
- Wetland A (green square)
- 1 km Buffer (white square)
- Accessible Habitat (orange square)

Figure 2
Wetland A Rating Figures

Figures 3 and 4

From Department of Ecology Water Quality Atlas, 2022

Water Quality Atlas Map



Water quality improvement projects

Select the waterbody or pollutant name to find more information about the specific project.

Waterbody Name(s)	Pollutant(s)	Status	Project Lead(s)
Bear Creek Basin	Fecal Coliform	EPA approved	425-648-7165
Bear Creek Basin	Dissolved Oxygen, Temperature	EPA approved	425-648-7165
Cotton Lake	Total Phosphorus	EPA approved	425-648-7165
Diamond and Lower Green River	Ammonia-N	EPA approved	425-648-7165
Diamond and Green River	Pollutant loading	Working with technical advisory group	Rachel McCrae 425-648-7033
Edmonds Creek	Fecal Coliform	EPA approved	425-648-7165
Frances Lake	Total Phosphorus	EPA approved	425-648-7298
Green River and Neahalem Creek	Dissolved Oxygen, Temperature	EPA approved	425-648-7165
Greenup Creek Basin	Fecal Coliform	EPA approved	425-648-7165
Lake Sehome	Total Phosphorus	EPA approved	425-648-7298
Little Bear Creek	Fecal Coliform	EPA approved	425-648-7165
Neahakum Creek	Bacteria	Under development	425-648-7165
North Creek	Fecal Coliform	EPA approved and Has an implementation plan	425-648-7165
Outer Creek	Fecal Coliform	EPA approved	425-648-7165
Samish River	Dissolved Oxygen, Temperature	Under development	425-648-7165
Scouller River	Ammonia-N, BOD (5-day), Fecal Coliform	EPA approved	425-648-7165
Scouller River	Temperature	EPA approved and Has an implementation plan	425-648-7165
Scoo Creek	Fecal Coliform	Under Development	425-648-7165
Scoo Creek	Acute habitat, Dissolved Oxygen, Temperature	Under Development	425-648-7165

To request ADA accommodation, call Ecology at 360-407-7068, 711 (relay services) or 877-855-6541 (TT/VI). More about our accessibility services.

Appendix D

Photo Pages





SOURCE: ESA, 2022

Lake Forest Park

Photo 1
McKinnon Creek, within eastern portion of study area,
photo taken facing east



SOURCE: ESA, 2022

Photo 2
Culvert on east side of McKinnon Creek, photo taken facing east



SOURCE: ESA, 2022

Photo 3
Vegetation within Wetland A, facing south on left bank of
McKinnon Creek



SOURCE: ESA, 2022

Photo 4
Conditions of interrupted buffer area, road is SR 104
facing north



SOURCE: ESA, 2022

Photo 5
Conditions of McKinnon Creek near Wetland A, facing west



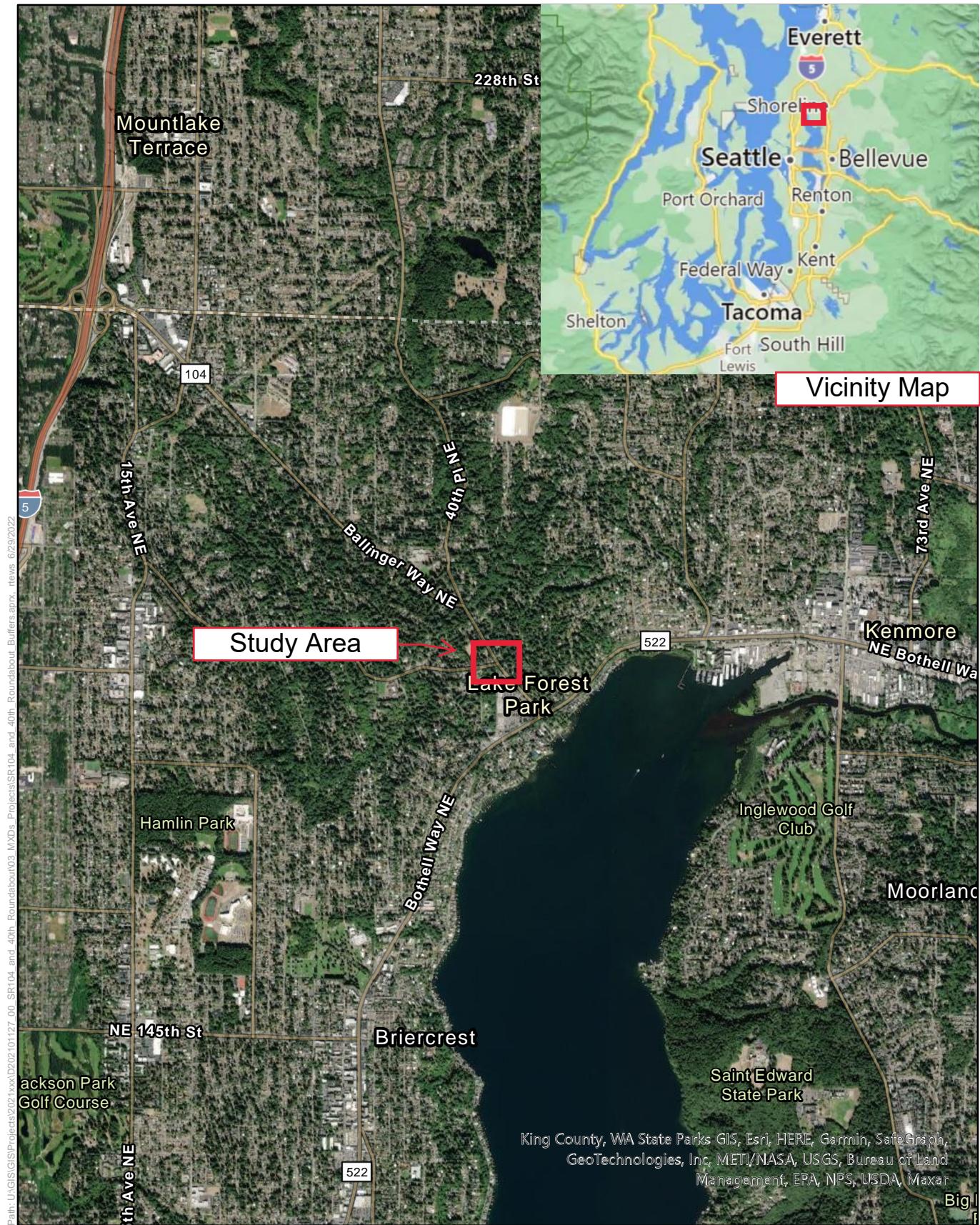
SOURCE: ESA, 2022

Photo 6
Big leaf maples that may meet the exceptional
tree criteria within the study area

Appendix E

Figures

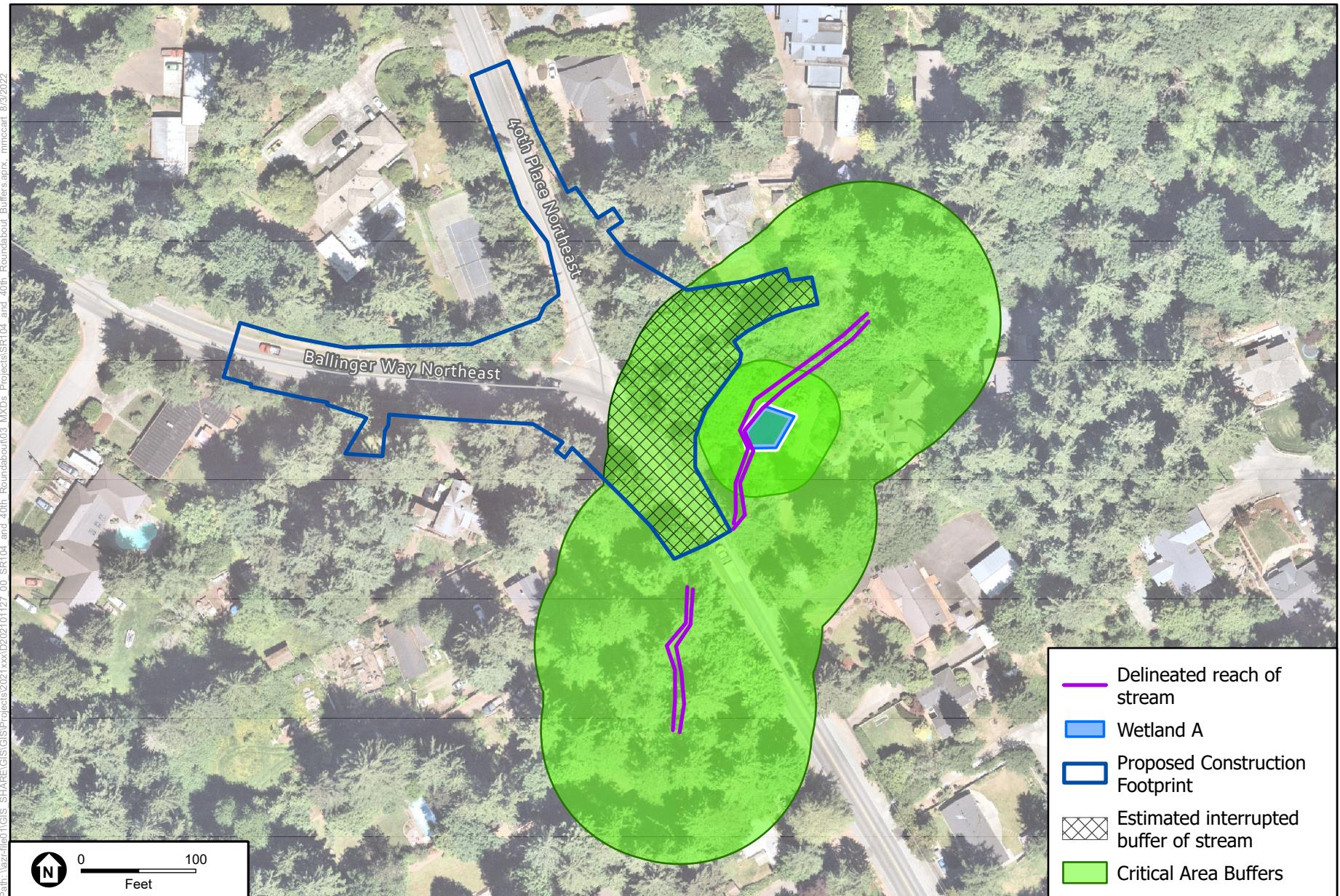




SOURCE: Open Maps, ESA, 2022.

Lake Forest Park SR 104

Figure 1
Project Location and Study Areas



SOURCE: Nearmap, 2022; ESA, 2022

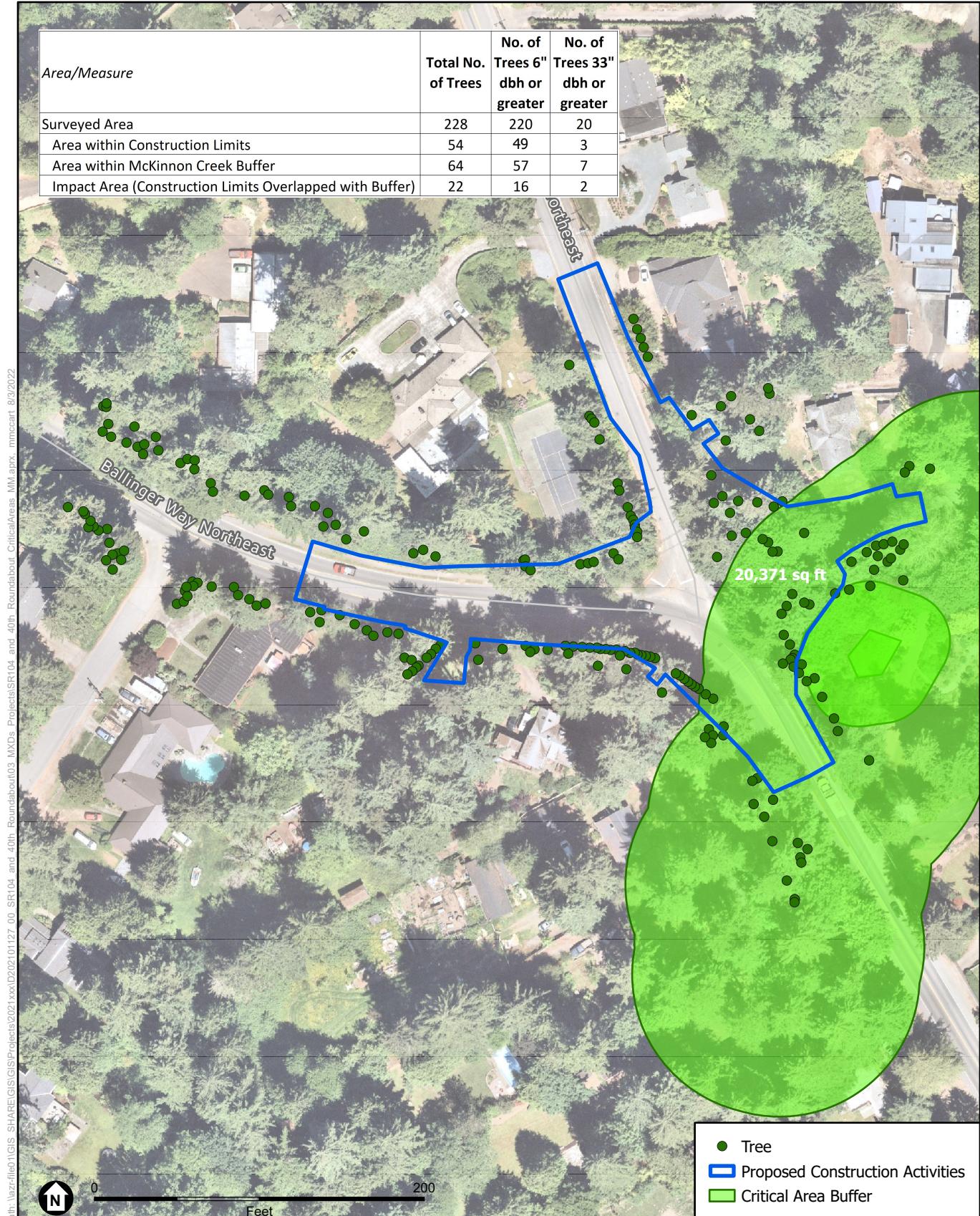
Figure 2
Critical Areas



SOURCE: 1 Alliance Geomatics, ESA, 2022.

- Wetland Boundary
- ▲ OHWM of McKinnon Creek
- Wetland Data Plots

Lake Forest Park SR 104
Figure 3
Existing Conditions
Topographic Survey



SOURCE: Nearmap, 2022, ESA, 2022

SR104 and 40th Roundabout

Figure 4
Critical Areas Impacts

