DRAFT
CRITICAL AREAS REPORT/ SENSITIVE AREAS STUDY

25TH AVENUE NORTHEAST FLOOD REDUCTION PROJECT

Prepared for
City of Shoreline
and
Louis Berger

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA

Note:
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CRITICAL AREAS REPORT/ SENSITIVE AREAS STUDY

25TH AVENUE NORTHEAST FLOOD REDUCTION PROJECT

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DRAFT
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DISCLAIMER

Herrera Environmental Consultants, Inc. has prepared this report for use by the City of Shoreline, Washington. The results and conclusions in this report represent the professional opinion of Herrera Environmental Consultants, Inc. They are based upon examination of public domain information concerning the study area, site reconnaissance, and data analysis.

The work was performed according to accepted standards in the field of jurisdictional wetland determination and delineation using the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010). In addition, work was conducted according to accepted standards of determining the ordinary high water mark (OHWM) of streams using the definition set forth in Washington Administrative Code 173 22 030(11) and *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010). However, final determination of jurisdictional wetland and OHWM boundaries pertinent to Section 404 of the Clean Water Act is the responsibility of the Seattle District of the US Army Corps of Engineers. Various agencies of the State of Washington and local jurisdictions may require a review of final site development plans that could potentially affect zoning, buffer requirements, water quality, or habitat functions of lands in question. Therefore, the findings and conclusions in this report should be reviewed by appropriate regulatory agencies before any detailed site planning or construction activities.

HERRERA QUALIFICATIONS

Established in 1980, Herrera Environmental Consultants, Inc. (Herrera) is an innovative, employee-owned, consulting firm focused on three practice areas: water, restoration, and sustainable development. Herrera's interdisciplinary teams of scientists, engineers, and planners provide scientifically defensible and realistic solutions to complex resources challenges facing municipalities, utilities, government agencies, tribes, nonprofits, and businesses. Herrera's philosophy is to integrate protection of environmental, cultural, and economic values into all of our projects.

The following staff authored this report and conducted field work in support of this report. A summary of their qualifications is provided.

Shelby Petro, MESM, WPIT

Shelby Petro is a wetland scientist and environmental permit coordinator with 8 years of experience in environmental consulting, specializing in natural resources management, wetland science, and regulatory compliance for public and private projects. Shelby conducts biological resources surveys for special-status plant and wildlife species; performs wetland delineations and critical areas assessments; prepares technical reports and documentation for National and State Environmental Policy Act (NEPA and SEPA) compliance; and prepares mitigation plans for impacts to wetlands and streams. Shelby coordinates with local, state, and federal agencies, completes applications, and obtains permits and approvals for project compliance with regulations including Critical Area Ordinances, Shoreline Management Act, State Hydraulic Code, SEPA, NEPA, Endangered Species Act (ESA), and Clean Water Act (CWA) Sections 401 and 404.

Credentials

- MESM, Master of Environmental Science and Management, University of California, Santa Barbara, 2014
- BS, Biology, Indiana Wesleyan University, 2007
- Certificate in Wetland Science and Management, University of Washington, 2015
- WPIT, Wetland Professional in Training, Society of Wetland Scientists, 2015
- Certified Wetland and Wildlife Biologist, Pierce County, 2014 – present
- Certified Biological Assessment Junior Author, WSDOT, 2015 – present

Julia Munger, WPIT

Julia Munger is a natural resources scientist with 6 years of professional experience in stream, wetland, and forest restoration; integrated pest management; wildlife surveys and habitat assessment; and parks maintenance and construction. Julia has extensive experience in habitat restoration, including the planning, implementation, monitoring and maintenance of restoration and mitigation sites. She has delineated wetland in Washington, Alaska, Oregon, and Montana. She has worked in Washington and California to identify, map, and eradicate invasive plant species. Julia conducts vegetation monitoring of mitigation and restoration sites; wetland and stream delineations; and provides recommendations and technical reports to support permit compliance and performance standards.

Credentials

- BS, Environmental Science, Huxley College at Western Washington University, 2008
- ISA Certified Arborist, International Society of Arboriculture, PN-7903A, 2014
- Certificate in Wetland Science and Management, University of Washington, 2013
- Wetland Professional in Training, Society of Wetland Scientists, 2014
- Commercial Pesticide Applicator with Aquatic Application Credentials, Washington State Department of Agriculture

EXECUTIVE SUMMARY

This critical areas report/sensitive areas study was prepared for the 25th Avenue NE Flood Reduction Project in accordance with current federal, state, and local regulations and guidance. Critical areas/environmentally sensitive areas, including wetlands and streams/fish and wildlife habitat conservation areas, are covered in this report. Other critical areas/environmentally sensitive areas, if present, are covered in separate reports and, therefore, are not mentioned in this report.

Wetland delineations were conducted in compliance with the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010) and *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

The Watershed Company (Watershed 2016) previously delineated one wetland in the study area, Wetland A, and Herrera biologists delineated one additional wetland in the study area, Wetland B (Table ES-1). Wetland A is a riparian wetland along Ballinger Creek within Brugger's Bog Park in the city of Shoreline. Wetland B is a riverine and depressional wetland south of NE 195th Street along Ballinger Creek in the city of Lake Forest Park.

Table ES-1. Wetlands Delineated in the Study Area for the 25th Avenue NE Flood Reduction Project.

Wetland Name	Size of Wetland (square feet/acre)	USFWS Classification[a]	Hydrogeomorphic Classification[b]	Wetland Rating Category	Standard Buffer Width (feet)	Minimum Buffer Width (feet)
A	10,197/0.23	PFO	Riverine	II[c,d]	165[f]	n/a[f]
B	54,808/1.26	PSS/PFO	Riverine, Depressional	II[c]/II[e]	100[g]	70[g]

[a] US Fish and Wildlife Service classification is based on Cowardin et al. (1979): palustrine forested (PFO) and palustrine scrub-shrub (PSS).

[b] Hydrogeomorphic classification is based on Brinson (1993).

[c] Wetland Category is based on the Washington State Department of Ecology (Ecology) wetland rating system (Hruby 2014).

[d] The City of Shoreline requires the use of Ecology's 2014 rating system.

[e] Wetland Category is based on the criteria outlined in Lake Forest Park Municipal Code (LFPMC) 16.16.040.AA. The City of Lake Forest Park does not require the Ecology rating system.

[f] Wetland buffer widths are based on the Ecology wetland rating and habitat score, per Shoreline Municipal Code (SMC) 20.80.330. Standard buffer widths assume the incorporation of mitigation measures outlined in SMC Table 20.80.330(A)(2). If an applicant chooses not to apply the mitigation measures, then a 33 percent increase in the width of all buffers is required.

[g] Wetland buffer widths are based on LFPMC 16.16.320.A. The City of Lake Forest Park allows for a minimum buffer width in accordance with the criteria outlined in LFPMC 16.16.320.E.

The ordinary high water marks (OHWMs) of streams within the study area were delineated using the definition provided in the Washington Administrative Code [WAC], Section 222-16-010, which has been adopted by the Cities of Shoreline and Lake Forest Park. In addition, methods in the publication *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010) were applied. Herrera biologists flagged the OHWM of two segments of Ballinger Creek within the study area. The Watershed Company (Watershed 2016) previously delineated the OHWM of Ballinger Creek within Brugger's Bog Park. Ballinger Creek flows south through the study area from Brugger's Bog Park in the north, through a culvert under 25th Avenue NE, in an open channel east of 25th Avenue NE and north of NE 195th Street, through a culvert under NE 195th Street, and continues southeast along the east side of Ballinger Way NE out of the study area.

Within the city of Shoreline, Ballinger Creek is a Type F stream, is regulated as a critical area (fish and wildlife conservation area), and is afforded a 115-foot standard buffer (SMC 20.80.280). Within the city of Lake Forest Park, Ballinger Creek is a Category I stream, is regulated as an environmentally sensitive area (stream), and is afforded a 115-foot standard buffer and 70-foot minimum buffer (LFPMC 16.16.350).

INTRODUCTION

This critical areas report/sensitive areas study was prepared for the 25th Avenue NE Flood Reduction Project (hereafter referred to as the project). The City of Shoreline proposes to reduce flooding along 25th Avenue NE by upgrading two undersized culverts, one along Ballinger Creek at 25th Avenue NE and the second along Ballinger Creek at NE 195th Street.

The project study area begins along Ballinger Creek at the northern boundary of Brugger's Bog Park in the city of Shoreline and ends approximately 300 feet south of the intersection of NE 195th Street and Ballinger Way NE in the city of Lake Forest Park (Figure 1). The Watershed Company (Watershed 2016) delineated wetlands and streams in the study area within Brugger's Bog Park in August 2013 and April 2016. Herrera Environmental Consultants, Inc. (Herrera) conducted an additional wetland and stream delineation in May 2016, the results of which are described herein.

This report describes the conditions of wetlands and fish and wildlife habitat conservation areas (e.g., streams), as well as wetland and stream ratings and required buffer widths. It also identifies applicable federal, state, and local laws and regulations.

Impacts associated with the project and proposed mitigation and monitoring will be incorporated into a future version of this report during Phase II of project design and development.

PROJECT SETTING

The study area is located in the cities of Shoreline and Lake Forest Park, King County, Washington (Figure 1). The study area is in Section 4 of Township 26 North, Range 4 East of the Willamette Meridian (WDFW 2009) on portions of parcels 4022901132, 4022901111, 1324000000, 0426049049, and 8665900022. The study area is in the northern portion of Water Resource Inventory Area (WRIA) 8 (Cedar-Sammamish) within the Lyon Creek drainage basin, which discharges into Lake Washington.

Land use in the surrounding vicinity is a mix of residential, commercial, and park properties. Ballinger Creek flows south through the study area from Brugger's Bog Park in the north, through a culvert under 25th Avenue NE, in an open channel east of 25th Avenue NE and north of NE 195th Street, through a culvert under NE 195th Street, and continues southeast along the east side of Ballinger Way NE and flows into Lyon Creek downstream of the study area. The City of Shoreline's North Maintenance Facility and Shoreline School District's Aldercrest Annex are both large properties located along 25th Avenue NE, adjacent to the study area (Figure 1).

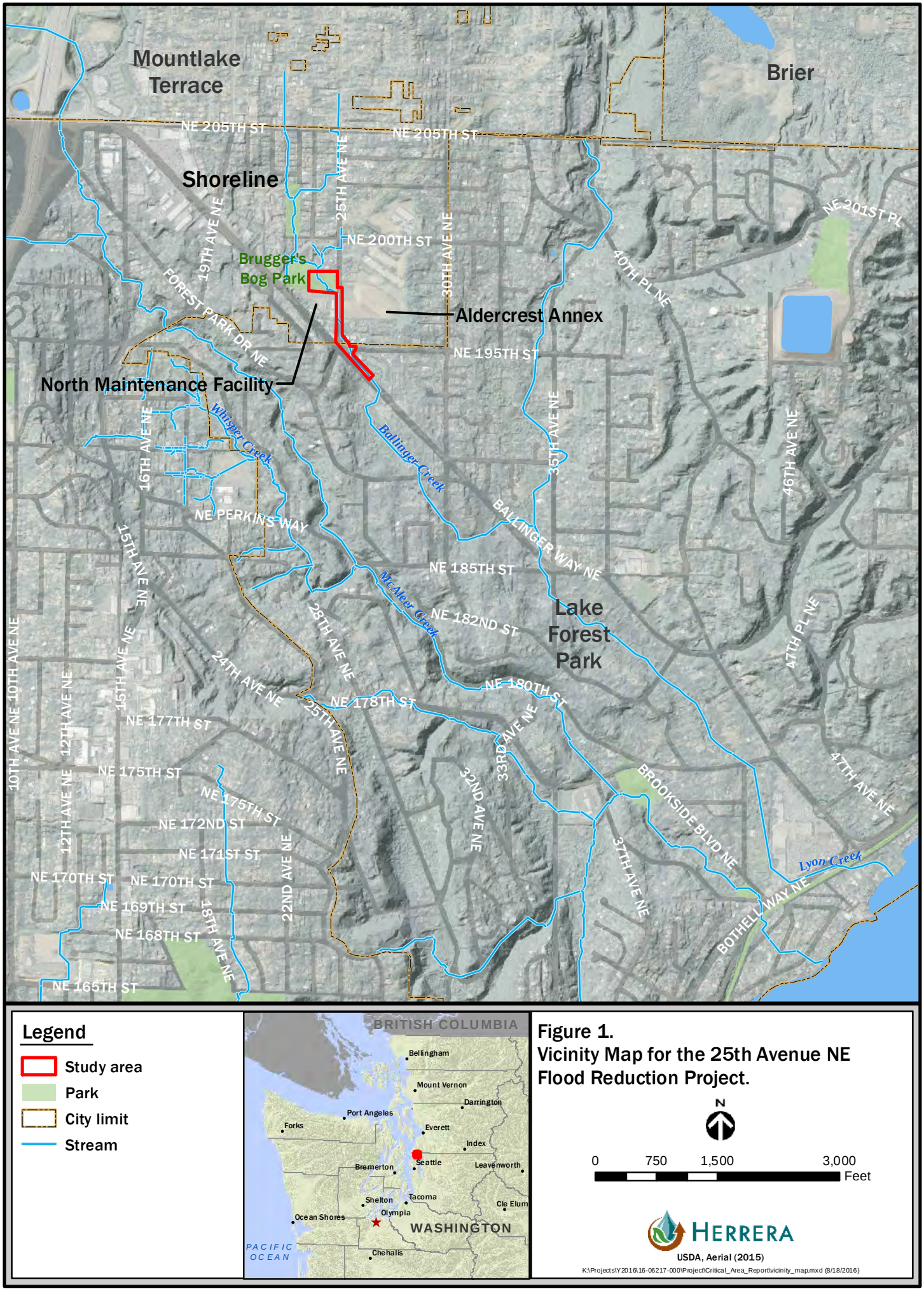

Figure 1.
Vicinity Map for the 25th Avenue NE Flood Reduction Project.

STUDY OBJECTIVES

The objectives of Herrera's study were to:

- Delineate (flag) all wetlands and streams in the study area.
- Classify vegetation classes within delineated wetlands using the US Fish and Wildlife Service (USFWS) classification system (Cowardin et al. 1979).
- Classify all delineated wetlands using the hydrogeomorphic classification system (Brinson 1993).
- Evaluate wetland functions and values using the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014) (also referred to as the Ecology rating system).
- Determine wetland categories and classes; stream type; and applicable wetland and stream buffer widths required by Shoreline and Lake Forest Park municipal codes.
- Identify regulations and guidance applicable to project impacts on wetlands, streams, and buffers set forth by local, state, and federal authorities.
- Classify all streams within the study area according to the Washington Department of Natural Resources (WDNR) Forest Practices Water Typing as described in the Washington Administrative Code (WAC 222-16-031).
- Identify fish and wildlife habitat conservation areas as described by Shoreline Municipal Code (SMC) 20.80.260.
- Identify wildlife habitat conservation areas as described by Lake Forest Park Municipal Code (LFPMC) 16.16.040.DD and 16.16.380.

APPLICABLE LAWS AND REGULATIONS

Wetlands and streams are subject to a variety of federal, state, and local regulations. Federal laws regulating wetlands and streams include Sections 404 and 401 of the Clean Water Act (United States Code, Title 33, Chapter 1344 [33 USC 1344]). Washington State laws and programs designed to control the loss of wetland acreage include the State Environmental Policy Act (SEPA) and Section 401 of the Clean Water Act (administered by the Washington State Department of Ecology [Ecology], as mandated by the Washington State Water Pollution Control Act). The study area is located within the city limits of Shoreline and Lake Forest Park and are, therefore, subject to those jurisdictions' municipal codes, which specify wetland categories/classes, stream types/classes, required buffer widths, development standards, and mitigation requirements for critical or environmentally sensitive areas within their jurisdiction.

Clean Water Act Sections 404 and 401

Section 404 of the federal Clean Water Act regulates the placement or removal of soil or other fill, grading, or alteration (hydrologic or vegetative) in waters of the United States, including wetlands and streams (33 USC 1344). The US Army Corps of Engineers (USACE) administers the permitting program under the act. The permits include nationwide (general) permits for projects involving minor fills, grading, or alteration; and individual permits for projects that require larger areas of disturbance to waters of the United States. USACE does not regulate wetland or stream buffers.

Section 401 of the Clean Water Act requires that proposed dredge (removal) and fill activities permitted under Section 404 be reviewed and certified to ensure that such activities meet state water quality standards. Washington State 401 certification is administered by Ecology for all Section 404 permits. Washington State 401 certification is granted without the need for a separate permit from Ecology for projects that qualify for a Section 404 nationwide permit, meet specific Section 401 certification conditions of the nationwide permit, and meet Ecology 401 General Conditions. If that is not the case, Ecology requires an Individual 401 Water Quality Certification permit.

Washington State Laws

Washington State laws and programs designed to control the loss of wetland acreage include SEPA and Section 401 of the Clean Water Act (a federal law that is implemented in the state by Ecology as noted above and as mandated by the Washington State Water Pollution Control Act).

The Washington Department of Fish and Wildlife (WDFW) administers the Hydraulic Project Approval (HPA) program under the state Hydraulic Code (WAC 220-110), which was specifically designed to protect fish life. An HPA permit is required for projects that will use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state.

City of Shoreline Code

The City of Shoreline regulates wetlands, fish and wildlife habitat conservation areas, and adjacent buffers within its jurisdiction as critical areas. Buffers are required around critical areas to protect their functions and values.

Wetlands

The City of Shoreline rates wetlands according to the *Washington State Wetland Rating System for Western Washington: 2014 Update* (SMC 20.80.320; Hruby 2014). Wetlands are rated as Category I, II, III, or IV, according to the level of function they provide and how highly they score on the Ecology rating system. Standard buffer widths defined by SMC 20.80.330 are based on the wetland rating and habitat score.

Fish and Wildlife Habitat Conservation Areas

The City of Shoreline designates fish and wildlife habitat conservation area as critical areas that include: 1) areas where State or Federally designated endangered, threatened, and sensitive species have a primary association; 2) areas where State priority habitats and areas associate with State priority species; 3) commercial and recreational shellfish areas; 4) kelp and eelgrass beds and herring and smelt spawning areas; and 5) Waters of the State (SMC 20.80.270). The City of Shoreline types streams in accordance with the WDNR water typing system (WAC 222-16-030; SMC 20.80.270.E). Standard buffer widths are based on stream type (SMC 20.80.280).

City of Lake Forest Park Code

The City of Lake Forest Park regulates wetlands, streams, wildlife habitat conservation areas, and adjacent buffers within its jurisdiction as environmentally sensitive areas. Buffers are required around environmentally sensitive areas to protect their functions and values.

Wetlands

The City of Lake Forest Park categorizes wetlands according to LFPMC 16.16.040.AA. Wetlands are rated as Category I, II, or III, according to criteria outlined in the code. Standard buffer widths defined by LFPMC 16.16.320 are based on the wetland rating. Minimum buffer widths may be authorized in accordance with criteria outlined in LFPMC 16.16.320.E.

Streams

The City of Lake Forest Park types streams according to criteria outlined under LFPMC 16.16.040.X. Standard buffer widths are based on stream type (LFPMC 16.16.350). Minimum buffer widths may be authorized in accordance with criteria outlined in LFPMC 16.16.350.G.

Wildlife Habitat Conservation Areas

The City of Lake Forest Park designates wildlife habitat conservation areas as feeding, breeding, and nesting sites for priority, endangered, or threatened species (LFPMC 16.16.040.DD). These areas include: 1) priority habitats with priority species; 2) naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat; 3) Waters of the State; 4) lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; or 5) state natural area preserves and natural resource conservation areas.

METHODS AND MATERIALS

Evaluating the presence, extent, and type of wetlands, streams, and fish and wildlife conservation areas requires a review of available information about the site (e.g., surveys, studies), followed by an onsite wetland and stream delineation and confirmation of existing delineations. The following sections describe the research methods and field protocols for the wetland and stream evaluations. More information about the methodology used in the wetland delineation performed for the project is available in Appendix A.

REVIEW OF AVAILABLE INFORMATION

Herrera staff reviewed available literature to determine the historical and current presence of wetlands and streams in and near the study area. Sources of information included:

- Aerial photographs of the study area and project vicinity
- National Wetlands Inventory map of wetland areas in the study area (USFWS 2014)
- City of Shoreline wetland and stream inventory (Shoreline 2016)
- City of Shoreline Lyon Creek Basin Plan (Shoreline 2015)
- City of Lake Forest Park Sensitive Areas Map (Lake Forest Park 2009a)
- City of Lake Forest Park Surface Water Management Plan (Lake Forest Park 2009b)
- City of Shoreline Maintenance Facility, Wetland and Stream Delineation Report (Watershed 2016)
- Hydrographic data (stream locations) for King County (USGS 2016)
- A Catalog of Washington Streams and Salmon Utilization (WDF 1975)
- SalmonScape computer mapping system (WDFW 2016a)
- Washington State Priority Habitats and Species (PHS) data (WDFW 2016b).
- Washington State Natural Heritage data (WDNR 2016)
- Climate data (NRCS 2016a)
- King County soil survey maps for the study area (NRCS 2016b)
- Hydric soils list and soil unit descriptions for the study area (NRCS 2016c)

WETLAND DELINEATION

The wetland delineation was performed in accordance with the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010) and *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987).

The methods in the manuals listed above use a three-parameter approach for identifying and delineating wetlands, and rely on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. The methods for evaluating those three parameters are described in Appendix A. The wetland delineation for the project was performed according to procedures specified under the routine wetland determination method (Environmental Laboratory 1987).

To identify potential wetlands, Herrera wetland biologists evaluated field conditions by traversing the study area and noting wetlands, streams, other aquatic features. The biologists evaluated field conditions within 300 feet of the study area boundary in the city of Shoreline and within 150 feet of the study area boundary in the city of Lake Forest Park. For parcels without permission to access, biologists observed the surrounding areas from within the study area boundaries.

A test plot was established for each area that appeared to have potential wetland characteristics. For each test plot, data on dominant plant species, soil conditions in test plots, and evidence of hydrologic conditions were recorded on wetland determination data forms (Appendix B). Plants, soils, and hydrologic conditions were also analyzed and documented in adjacent upland test plot locations. Based on collected data, a determination of wetland or upland was made for each area examined. Observations of wildlife species and signs of their presence were also noted during the field visit.

Following confirmation of wetland conditions in a given area, the wetland boundary was delineated by placing sequentially numbered, pink "WETLAND BOUNDARY" flagging along the wetland perimeter. Test plot locations were marked with pink-and-black-striped flagging. The locations of wetland boundaries and test plots were subsequently surveyed by Perteet. Wetland boundaries outside of the study area were estimated using aerial photography.

For wetlands delineated within Brugger's Bog Park by The Watershed Company (Watershed 2016), Herrera biologists walked the delineated boundary and confirmed that all areas that met the three wetland characteristics within the study area were included in the delineated wetland boundary.

Wetland Classification, Rating, and Functional Assessment

Wetland Classification

Wetlands observed on the study area were classified according to the USFWS classification system (Cowardin et al. 1979). That system is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate. The wetlands were also classified according to the hydrogeomorphic system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

Wetland Rating

Wetlands in the city of Shoreline were rated using *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014), hereafter referred to as the Ecology rating system. The Ecology rating system categorizes wetlands according to specific attributes such as rarity; sensitivity to disturbance; hydrologic, water quality, and habitat functions; and special characteristics (e.g., mature forested wetland and bog). The total score for all functions determines the wetland rating. The rating system consists of four categories, with Category I wetlands exhibiting outstanding functions and/or special characteristics, and Category IV wetlands exhibiting minimal attributes and functions. The rating categories are used to identify permitted uses in the wetland and its buffer, to determine the width of buffers needed to protect the wetland from adjacent development, and to identify the mitigation ratios required to compensate for potential impacts on wetlands and wetland buffers. The City of Shoreline requires the use of the Ecology rating system (SMC 20.80.320).

Wetlands within the city of Lake Forest Park were rated using the criteria described in LFPMC 16.16.040.AA. Using those criteria, wetlands are rated into one of three categories, Category I, II, or III. Category I wetlands are those that contain federally listed endangered or threatened species; habitat for listed species; 40 to 60 percent permanent open water in dispersed patches with two or more vegetation classes; equal to or greater than 10 acres in size with three or more classes and one of the classes is open water; or wetlands with plant associations of infrequent occurrence that are associated with wetland values and functions. Category II wetlands are those that are greater than 1 acre in size, equal to or less than 1 acre with three wetland vegetation classes or a forested class, contain heron rookeries, or contain raptor nesting trees. Category III wetlands are those that do not meet the criteria for another category and are equal to or less than 1 acre in size with two or fewer wetland classes.

Wetland Functional Assessment

Wetland functions are those physical and chemical processes that occur within a wetland, such as the storage of water, cycling of nutrients, and maintenance of diverse plant communities and habitat that benefit wildlife. Wetland functions are grouped into three broad categories: water quality, hydrologic, and habitat.

- Water quality functions include the potential for removing sediment, nutrients, heavy metals, and toxic organic compounds in the water passing through the wetland.
- Hydrologic functions include reducing the velocity of stormwater, recharging and discharging groundwater, and providing flood storage.
- Habitat functions include providing food, water, and shelter for fish, shellfish, birds, amphibians, and mammals. Wetlands also serve as a breeding ground and nursery for numerous species.

For wetlands within Shoreline and Lake Forest Park, wetland functions were assessed using the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014), which is approved by Ecology for evaluating wetland functions in Washington. This system generates a qualitative functional rating (high, moderate, or low) for each of the functions (water quality, hydrology, and habitat) provided by wetlands. The City of Lake Forest Park, per LFPMC 16.16.040.CC, evaluates wetland functions according to those set forth in the USACE regulations (33 CFR 320.4(b)(2)), which are included in the Ecology rating system (Hruby 2014).

Fish and Wildlife Habitat Conservation Area Delineation and Classification

A fish and wildlife conservation area is an area that supports regulated fish or wildlife species or habitats, typically identified by known point locations of specific species, habitat areas, or both. Streams are considered to be one type of fish and wildlife habitat conservation area according to SMC 20.80.270 and LFPMC 16.16.040.DD.

The OHWMs of streams within the study area were delineated using the definition provided in WAC Section 222-16-010, which has been adopted by the Cities of Shoreline and Lake Forest Park. According to that definition, the OHWM of streams is "that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation." In addition, methods in the publication *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010) were applied.

To delineate the OHWM, Herrera biologists examined the bed and adjacent banks of streams in the study area for indications of regular high water events. Factors considered when assessing changes in vegetation include:

- Scour (removal of vegetation and exposure of gravel, sand, or other soil substrate)
- Drainage patterns
- Elevation of floodplain benches
- Changes in sediment texture across the floodplain
- Sediment layering
- Sediment or vegetation deposition
- Changes in vegetation communities across the floodplain

Herrera hung white/blue-dotted flagging on vegetation at the site, indicating the horizontal location of the OHWM along the stream. The locations of OHWM flags were subsequently surveyed by Perteet.

For the stream delineated within Brugger's Bog Park by The Watershed Company (Watershed 2016), Herrera biologists walked the mapped OHWM and confirmed the delineated boundary.

Streams within the city limits of Shoreline were classified using the WDNR water-typing system based on WAC 222-16-030. That system is based primarily on fish, wildlife, and human use, and consists of four stream types: Type S, F, Np, or Ns. Type S streams are those surface waters that are inventoried as "Shorelines of the State" under the Shoreline Management Master Program for Shoreline, pursuant to Revised Code of Washington (RCW) Chapter 90.58.030. Type F streams and waterbodies are those known to be used by fish, or meet the physical criteria to be potentially used by fish. Type F streams may or may not have flowing water all year; they may be perennial or seasonal. The City of Shoreline further describes Type F streams as F-anadromous and F-nonanadromous streams (SMC 20.80.260.E). Type F-anadromous streams are those streams where there is naturally recurring use by anadromous fish populations, streams that are fish passable or have the potential to be fish passable by anadromous populations, and streams with planned restoration or removal of dams that will result in a fish passable connection to Lake Washington or Puget Sound. Type F-nonanadromous streams are those streams that contain existing or potential fish habitat but do not have the potential for anadromous fish use due to natural barriers to fish passage. Type Np streams have flow year-round and may have spatially intermittent dry reaches downstream of perennial flow but do not meet the physical criteria of a Type F stream to provide fish habitat. Type Ns streams do not have surface flow during at least some portion of the year, and do not meet the physical criteria of a Type F stream to provide fish habitat.

Streams within the city limits of Lake Forest Park were classified using the criteria outlined in LFPMC 16.16.040.X. That system is based primarily on fish habitat use and consists of Type I, II, and III streams. Type I streams are those that are used at least seasonally by fish for spawning, rearing, or migration; streams that are fish passable from Lake Washington; and streams or parts thereof that are waters of the state (WAC 222-16-031). Type II streams are those that are perennial, non-fish-bearing streams. Type III streams are those that are seasonal, non-fish-bearing streams.

RESULTS

This section discusses the results of the wetland and stream delineations, including a review of information obtained from various references, and an analysis of wetland and stream conditions in the study area as observed during field investigations.

ANALYSIS OF AVAILABLE INFORMATION

The available existing information compiled for the wetland and stream delineation is summarized in the following subsections.

Previously Mapped Wetlands and Streams

The National Wetlands Inventory does not indicate any wetlands within or adjacent to the study area. The City of Shoreline's wetland inventory GIS data indicates one wetland along the boundary between Brugger's Bog Park and the North Maintenance Facility and a wetland along Ballinger Creek within the study area, in addition to two offsite wetlands (Figure 2). The wetland along Ballinger Creek in Brugger's Bog Park was delineated and named Wetland A in 2013 and reconfirmed in 2016 (Watershed 2016). The City of Lake Forest Park's wetland inventory indicates one wetland within Brugger's Bog Park along Ballinger Creek, one wetland located in the southeast corner of the intersection of NE 195th Street and Ballinger Way NE, and several offsite wetlands (Figure 2).

The hydrography GIS data for the study area indicates one stream, Ballinger Creek, flowing south through the study area (Figure 2). The stream then continues generally south until it flows into Lyon Creek and eventually into Lake Washington.

Mapped Soils

No soil data were available for the study area (NRCS 2016b).

Climate Data

Precipitation characteristics in the weeks and months preceding wetland delineation work for the project are important to understand with respect to potential for drier or wetter than normal wetland conditions on the site. Nearby precipitation gage records were evaluated for that purpose. Precipitation data were obtained from the Natural Resources Conservation Service (NRCS) WETS database (NRCS 2016a). The historical average measurements were based on data collected in Seattle, Washington (WETS Station Seattle Sand PT WSFO, WA290 (Latitude 47°41'N, Longitude 122°15'W) for the period of record 1971 to 2000. The station is approximately 8 miles south of the study area.

Legend

- Study area
- Sensitive Area Ordinance wetland (King County)
- Wetland (City of Lake Forest Park)
- Wetland (City of Shoreline)
- Stream (King County)
- Stream (City of Shoreline)
- City limit

Figure 2.
Previously Mapped Wetlands and Streams in the Vicinity of the 25th Avenue NE Flood Reduction Project.

N

0 200 400 800 Feet

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USDA, Aerial (2015)

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Precipitation was evaluated for a 2-week and a 3-month period prior to field investigations, which occurred on May 31, 2016. Between May 16 and May 30, the historical average precipitation recorded 1.09 inches. Between May 16 and May 30, 2016, 1.18 inches of rain were recorded, which is 0.09 inch above average (NRCS 2016a). In the 3 months preceding the field investigations, the measured rainfall for March was wetter than normal, April was drier than normal, and May fell within the normal conditions (Table 1).

Table 1. Precipitation for the Three-Month Period Preceding Field Investigations.

Prior Month	WETS Historical Rainfall Percentile (inch)		WETS 2016 Measured Rainfall (inch)	Condition: Dry, Wet, Normal
	30th	70th		
March	2.95	4.45	5.22	Wet
April	2.04	3.36	1.57	Dry
May	1.49	2.49	1.63	Normal

Source: WETS Station: Seattle Sand PT WSFO, WA290, 1971–2000 (NRCS 2016a)

Fish Habitat Use

Based on WDFW's SalmonScape and PHS mapping, there is no documented fish habitat use in Ballinger Creek within the study area (WDFW 2016a, 2016b). Approximately 1 mile downstream of the study area, presence of coho salmon (*Oncorhynchus kisutch*) and resident coastal cutthroat trout (*O. clarkii clarkii*) has been documented within Ballinger Creek and further downstream within Lyon Creek (WDF 1979). Both coho salmon and resident coastal cutthroat are State priority species (WDFW 2016b). The culvert under 25th Avenue NE is identified as a total fish passage barrier; the culvert under NE 195th Street is identified as a partial barrier; and several additional partial barriers are documented downstream of the project area (WDFW 2016a).

Wildlife Habitat Use

According to WDFW PHS data (WDFW 2016b), there are no specific locations of priority habitats or species within the study area or immediate vicinity of the study area. The nearest mapped bald eagle (*Haliaeetus leucocephalus*) nest is greater than 1 mile from the study area. The nearest concentration of waterfowl is greater than 1 mile northwest of the study area at Ballinger Lake. The nearest biodiversity area and corridor is approximately 0.7 mile northeast of the study area along Lyon Creek, adjacent to Abbey View Memorial Park.

Analysis of Wetland Conditions

Wetland delineation field activities were conducted by Herrera biologists Shelby Petro and Julia Munger on May 31, 2016. The weather conditions during the fieldwork consisted of daytime

high temperatures of approximately 78 degrees Fahrenheit (°F), with mostly sunny conditions. It was determined that the growing season (as defined in Appendix A) had begun, because aboveground growth and development of vascular plant species was occurring, as indicated by herbaceous species growing in wetland areas.

Herrera biologists delineated one wetland in the study area, Wetland B, and confirmed the previously delineated boundary of Wetland A (Watershed 2016; Figure 3). Buffer widths shown in Figure 3 provide a representation of the potential regulatory constraints. Actual buffer widths will be dependent upon review of the project and site conditions by the cities of Shoreline and Lake Forest Park (SMC 20.80.310-350, LFPMC 16.16.320-330). Detailed descriptions of wetlands delineated in the study area are provided in Tables 2 through 4. The biologists completed wetland delineation and rating forms (Appendix B) for Wetland B. Detailed information about Wetland A, including delineation and rating forms, are included in Appendix C.

Table 2. Wetlands Delineated in the Study Area for the 25th Avenue NE Flood Reduction Project.

Wetland Name	Size of Wetland (square feet/acre)	USFWS Classification[a]	Hydrogeomorphic Classification[b]	Wetland Rating Category	Standard Buffer Width (feet)	Minimum Buffer Width (feet)
A	10,197/ 0.23	PFO	Riverine	II[c,d]	165[f]	n/a[f]
B	54,808/ 1.26	PSS/PFO	Riverine, Depressional	II[c]/II[e]	100[g]	70[g]

[a] US Fish and Wildlife Service classification is based on Cowardin et al. (1979): palustrine forested (PFO) and palustrine scrub-shrub (PSS).

[b] Hydrogeomorphic classification is based on Brinson (1993).

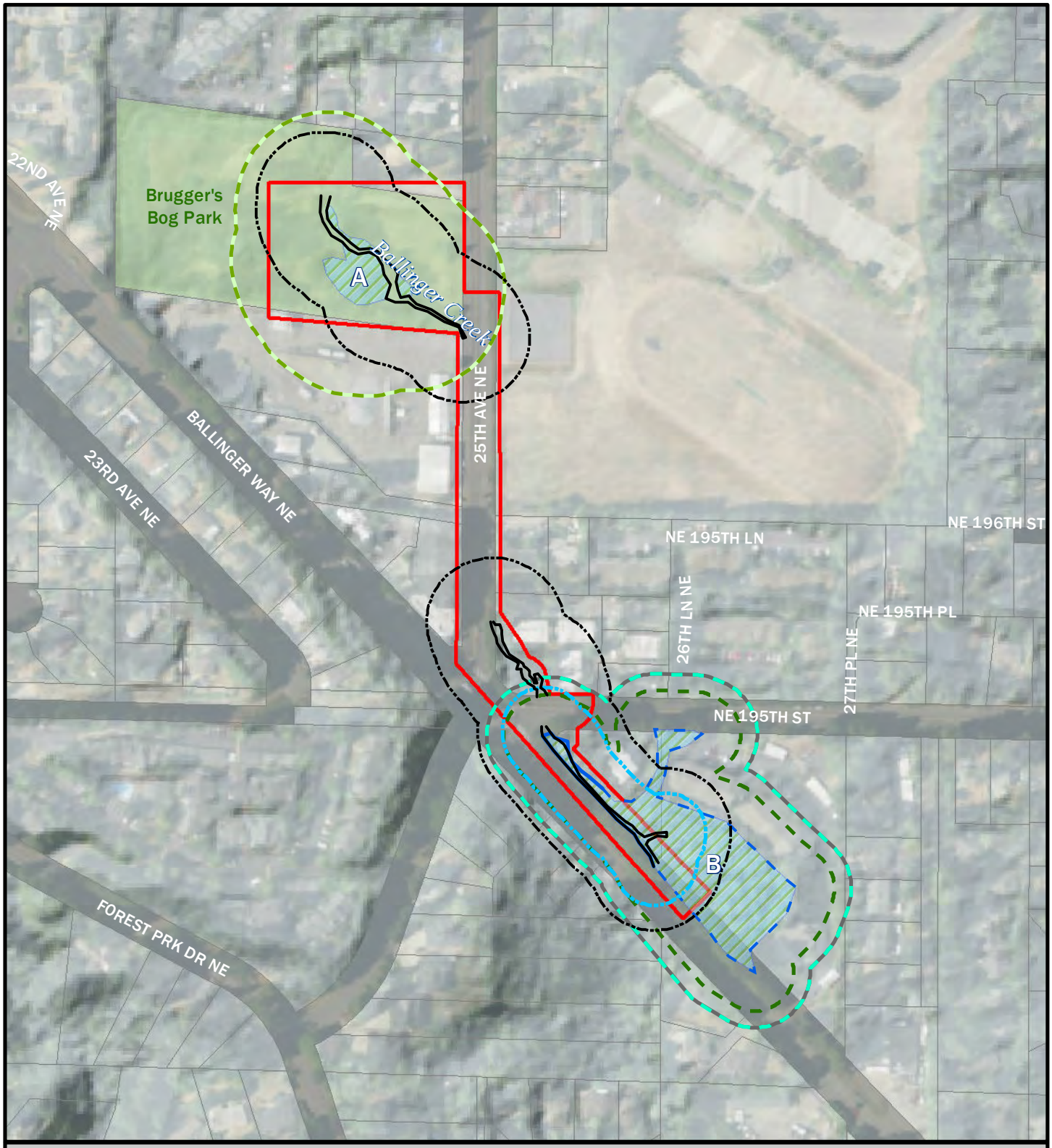
[c] Wetland Category is based on the Washington State Department of Ecology (Ecology) wetland rating system (Hruby 2014).

[d] The City of Shoreline requires the use of Ecology's 2014 rating system.

[e] Wetland Category is based on the criteria outlined in Lake Forest Park Municipal Code (LFPMC) 16.16.040.AA. The City of Lake Forest Park does not require the Ecology rating system.

[f] Wetland buffer widths are based on the Ecology wetland rating and habitat score, per Shoreline Municipal Code (SMC) 20.80.330. Standard buffer widths assume the incorporation of mitigation measures outlined in SMC Table 20.80.330(A)(2). If an applicant chooses not to apply the mitigation measures, then a 33 percent increase in the width of all buffers is required.

[g] Wetland buffer widths are based on LFPMC 16.16.320.A. The City of Lake Forest Park allows for a minimum buffer width in accordance with the criteria outlined in LFPMC 16.16.320.E.



Legend

- Study area
- Parcel
- Wetland area
- Surveyed wetland boundary
- Estimated wetland boundary
- OHWM

Wetland buffers

- 165-ft buffer (City of Shoreline)
- 100-ft buffer (City of Lake Forest Park)
- 70-ft buffer (City of Lake Forest Park - min.)

Stream buffers

- 115-ft buffer (City of Shoreline & City of Lake Forest Park - standard)
- 70-ft buffer (City of Lake Forest Park - min.)

Figure 3.
Wetlands and Streams Delineated in the Project Area for the 25th Avenue NE Flood Reduction Project.

N

0 125 250 500 Feet

HERRERA

USDA, Aerial (2015)

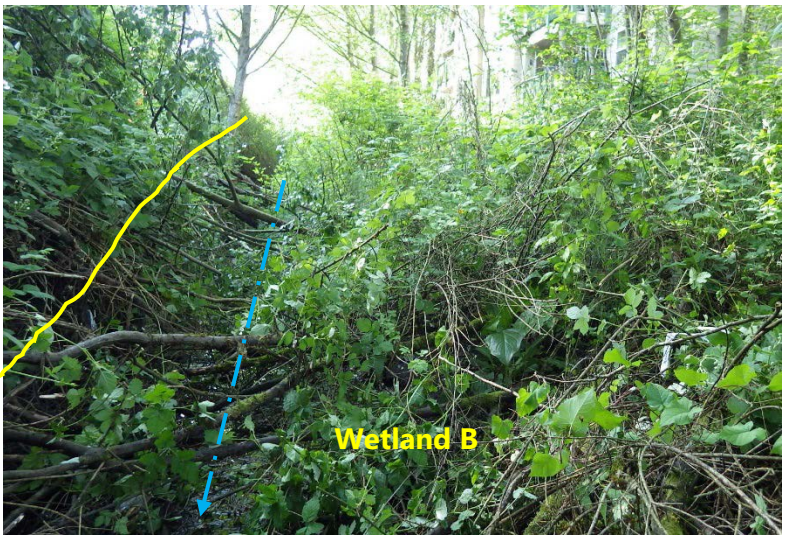
K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\delineated_wetlands.mxd (8/18/2016)

Table 3. Summary for Wetland A.

Wetland Name	Wetland A	
Location	**Southeast corner of Brugger's Bog Park along Ballinger Creek**	
	**Local Jurisdiction**	City of Shoreline
	WRIA	8
	Wetland Rating (2014)	Category II
	City of Shoreline Buffer Width	165 feet
	Cowardin Classification	Palustrine forested
	Hydrogeomorphic Classification	Riverine
	Wetland Data Form(s)	Appendix C, DP-1
	Upland Data Form(s)	Appendix C, DP-2
Size of Entire Wetland	10,197 square feet (0.23 acre).	
Dominant Vegetation	Wetland A is dominated by a forested community of red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera*), and Pacific willow (*Salix lucida*), with a scrub-shrub community of Sitka willow (*Salix sitchensis*), red-osier dogwood (*Cornus alba*), and salmonberry (*Rubus spectabilis*), and with an emergent community of skunk cabbage (*Lysichiton americanus*), small-fruited bulrush (*Scirpus microcarpus*), and creeping buttercup (*Ranunculus repens*) (Watershed 2016).	
Soils	Soils were examined to at least a 16-inch depth and exhibited hydric characteristics. At DP-1, the soil in the top 16 inches below the surface was black (10YR 2/1) sandy loam, with organic accumulations masking redoximorphic features. The soil is naturally problematic as the wetland is located within the active floodplain of Ballinger Creek; therefore, it does not meet any hydric soil indicators but is a hydric soil. At the upland test plot (DP-2), the top 8 inches of soil was a dark brown (10YR 3/3) loam (100 percent). The upland soil profile does not meet criteria of a hydric soil indicator (Watershed 2016).	
Hydrology	At DP-1, soils were saturated to the surface with a water table depth of approximately 14 inches. The wetland plot met the hydrology indicators for saturation (A3). Hydrologic inputs to this wetland include overbank flooding from Ballinger Creek, precipitation, groundwater, and runoff from surrounding uplands (Watershed 2016).	
Rationale for Delineation	All three wetland parameters are met.	
Rationale for Local Rating	The City of Shoreline Municipal Code classifies wetlands according to the current Ecology rating system (Hruby 2014), which rates Wetland A as a Category II.	
Buffer Condition	Buffers adjacent to the wetland consist of pockets of mixed coniferous-deciduous forest and shrubs scattered throughout mowed lawn in Brugger's Bog Park. 25th Avenue NE is located between 100 to 200 feet east of the wetland, and the North Maintenance Facility is located 50 feet south. Invasive species, including Himalayan blackberry (*Rubus armeniacus*), are dominant downstream of Wetland A along the stream corridor to 25th Avenue NE. Existing buffers provide moderate to low wildlife habitat and water quality functions.	

Table 4. Summary for Wetland B.

Wetland Name	Wetland B
Location	**Southeast of the intersection of NE 195th Street and Ballinger Way NE**



Local Jurisdiction	Lake Forest Park
WRIA	8
Wetland Rating	Category II
Lake Forest Park Buffer Width	100 feet (standard)/ 70 feet (minimum)
Cowardin Classification	Palustrine forested/ scrub-shrub
Hydrogeomorphic Classification	Depressional/ Riverine
Wetland Data Form(s)	Appendix B, TP-B-WET
Upland Data Form(s)	Appendix B, TP-B-UPL

Size of Entire Wetland	Approximately 54,808 square feet (1.26 acres). Not delineated in entirety; extends southeast of project area.
Dominant Vegetation	Wetland B is dominated by a forested community of red alder, black cottonwood, and Pacific willow, with salmonberry, Sitka willow, red-osier dogwood, creeping buttercup, large-leaf avens (*Geum macrophyllum*), and horsetail (*Equisetum telmateia*) in the understory.
Soils	At TP-B-WET, the top 17 inches of soil was black (10YR 2/1) silty clay loam and hemic muck with redoximorphic concentrations (7.5YR 4/6, 5 percent in the matrix). From 17 to 20+ inches below the surface, the soil was greenish gray (10GY 5/1) clay loam, with redoximorphic concentrations (10YR 4/6, 2 percent, in the matrix). This profile meets the criteria for the hydric soil indicators of thick dark surface (A12) and redoximorphic dark surface (F6). The upland soil profile does not meet criteria of a hydric soil indicator.
Hydrology	At TP-B-UPL, soils were saturated to the surface with a water table depth of approximately 10 inches. The wetland plot met the hydrologic indicators for saturation (A3) and high water table (A2). Hydrologic inputs to this wetland include water from Ballinger Creek, precipitation, groundwater, and runoff from surrounding uplands. The wetland outlet discharges into Ballinger Creek, which flows south from the project area.
Rationale for Delineation	All three wetland parameters are met.
Rationale for Local Rating	The Lake Forest Park Municipal Code classifies wetlands according to specific criteria, which rates Wetland B as a Category II. Wetland B also rates as a Category II using the Ecology rating system (Hruby 2014).
Buffer Condition	Buffers surrounding the wetland consist of NE 195th Street to the north, apartment buildings to the east and south, and Ballinger Way NE to the west. The vegetated buffer around the wetland consists of mowed lawn to the east and upland trees, shrubs, and invasive species including Himalayan blackberry and English ivy (*Hedera helix*), in a thin strip to the east of Ballinger Way NE. Existing buffers provide low wildlife habitat and water quality functions.

Evaluation of Wetland Functions

Wetland functions for each wetland within the study area were evaluated according to data in the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014). This system generates a qualitative functional rating (high, moderate, or low) for each of the functions (water quality, hydrology, and habitat) provided by wetlands. A summary of the function scores, the total wetland score, and the associated rating (category) for each wetland is provided in Table 5. The City of Lake Forest Park evaluates wetland functions according to those set forth in the USACE regulations (33 CFR 320.4(b)(2), which are included in the Ecology rating system (Hruby 2014). The functions of Wetland A were evaluated by Herrera using the data collected and provided by The Watershed Company (Watershed 2016; Appendix C).

Wetland A

Wetland A, a riverine wetland, has a moderate potential to improve water quality (i.e., remove toxins) at the site because the wetland has depressions over half the area of the wetland and herbaceous plants greater than 6 inches tall over two-thirds of the area of the wetland that can trap sediments during a flooding event. It has high potential on a landscape level to improve water quality functions because the area nearby generates pollutants. The wetland has a high value to society because it discharges to Lyon Creek, which is on Ecology's 303(d) list of impaired waters (Ecology 2016).

The wetland has a moderate potential to improve hydrologic functions at the site, because the wetland provides overbank storage and the vegetation present can slow down water velocities during flood events. At a landscape level, the wetland has high potential to improve hydrologic functions because the land around the wetland is impacted by development. The wetland has a high value to society because it captures water that would otherwise flow into the Ballinger Creek, where flooding is known to damage human and natural resources.

The wetland has a moderate potential for habitat at the site level. The wetland has a forested class with multiple strata and two hydroperiods, which lends to a low interspersion of habitats, but has a high richness of plant species and multiple special habitat features (e.g., large, downed, woody debris). The wetland has a low potential for habitat on a landscape level, due to the large amount of disturbed habitat adjacent to the wetland. The habitat provided by the site is valuable to society because there are three or more priority habitats within 100 meters of the wetland.

Wetland B

Wetland B, a riverine and depressional wetland, has a moderate potential to improve water quality at the site because the wetland has a highly constricted, permanently flowing outlet; persistent, ungrazed plants throughout most of the area; and seasonal ponding throughout more than a quarter of the wetland area. It has moderate potential on a landscape level to improve water quality functions because the area nearby generates pollutants and the wetland receives stormwater discharges. The wetland has a high value to society because it discharges to Lyon Creek, which is on Ecology's 303(d) list of impaired waters (Ecology 2016).

Table 5. Individual Wetland Function Scores for Wetlands in the Study Area for the 25th Avenue NE Flood Reduction Project.

Wetland Name	Water Quality Functions Rating[a]			Functions Hydrologic Rating[a]			Habitat Functions Rating[a]			Total Score[b]	Washington State Department of Ecology Rating Category[c]
	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value		
A	M	H	H	M	H	H	M	L	H	22	II
B	M	M	H	M	H	H	M	L	H	21	II

[a] Qualitative ratings of H (high), M (moderate), and L (low) are based on the Washington State Department of Ecology (Ecology) rating system (Hruby 2014).

[b] Total score is derived by adding all qualitative ratings together. Low ratings are worth 1 point, while Moderate ratings are worth 2 points, and High ratings are worth 3 points.

[c] Wetland category is based on the Ecology rating system (Hruby 2014).

The wetland has a moderate potential to improve hydrologic functions (storage of water) at the site because the wetland has a highly constricted, permanently flowing outlet; ponding up to a depth of 2 feet from the bottom of the outlet; and is relatively large compared to the contributing basin. At a landscape level, the wetland has high potential to improve hydrologic functions because the land around the wetland is impacted by development. The wetland has a high value to society because it captures water that would otherwise flow into Ballinger Creek, where flooding is known to damage human and natural resources.

The wetland has a moderate potential for habitat at the site level. The wetland has two vegetation classes, three hydroperiods, a high richness of plant species, a high interspersion of habitats, and multiple special habitat features (e.g., standing snags). The wetland has a low potential for habitat on a landscape level due to the large amount of disturbed habitat and urbanized area adjacent to the wetland. The habitat provided by the site is valuable to society because there are three or more priority habitats within 100 meters of the wetland.

Analysis of Fish and Wildlife Habitat Conservation Areas

Within the study area, Ballinger Creek is the only fish and wildlife habitat conservation area (SMC 20.80.270; LFPMC 16.16.040.DD). According to SalmonScape and PHS mapping (WDFW 2016a, 2016b), there is no documented fish habitat use in Ballinger Creek within the study area. Coho salmon and resident coastal cutthroat trout presence is documented downstream of the study area; several partial and total fish passage barriers prevent fish movement upstream (WDFW 2016a). The nearest mapped bald eagle nest and waterfowl concentrations are greater than 1 mile from the study area. The nearest biodiversity area and corridor is 0.7 mile from the study area. Furthermore, there are no State or Federally designated endangered, threatened, or sensitive species, State priority habitats, or State priority species within the study area or immediate vicinity of the study area. In addition, there are no commercial or recreational shellfish areas, kelp or eelgrass beds, herring or smelt spawning areas, naturally occurring ponds under 20 acres, waters planted with game fish, State natural area preserves, or natural resource conservation areas within the study area or the vicinity.

Ballinger Creek

Herrera biologists Shelby Petro and Julia Munger completed the stream delineation on May 25, 2016. The OHWMs of two segments of Ballinger Creek were delineated and the OHWM of one segment was confirmed in the study area. Herrera delineated the OHWM of Ballinger Creek in the segment on the northeast corner of the intersection of 25th Avenue NE and NE 195th Street, and the segment of Ballinger Creek in the southeast corner of the intersection of NE 195th Street and Ballinger Way NE for 300 feet south of NE 195th Street (Figure 3). Herrera confirmed the OHWM delineation of Ballinger Creek within Brugger's Bog Park, which was previously delineated by The Watershed Company (Watershed 2016). The stream characteristics are summarized in this section (Table 6).

Table 6. Stream Summary Table—Ballinger Creek.	
Stream Name	**Ballinger Creek**
	
Local Jurisdiction	City of Shoreline (north of NE 195th Street); City of Lake Forest Park (south of NE 195th Street)
WDNR Stream Type	n/a
Local Stream Rating	Type F-anadromous (Shoreline); Type I (Lake Forest Park)
Local Jurisdiction Buffer Width	115 feet standard (Shoreline); 115 feet standard/70 feet minimum (Lake Forest Park)
Documented Fish Habitat Use	No documented habitat use by fish within the study area; however, coho salmon and resident coastal cutthroat trout presence is documented downstream (WDFW 2016a; WDF 1979). The culvert under 25th Avenue NE is identified as a total fish passage barrier; the culvert under NE 195th Street is identified as a partial barrier; and several additional partial barriers are documented downstream of the project area (WDFW 2016a).
Location of Stream Relative to Project Corridor	Stream flows south through Brugger's Bog Park and Wetland A, under 25th Avenue NE (in a culvert), through an open channel north of NE 195th Street, under NE 195th Street (in a culvert), then continues southeast on the east side of Ballinger Way NE through Wetland B.
Connectivity (where stream flows from/to)	Stream flows south from Ballinger Open Space into Brugger's Bog Park, through the project area, then continues south through Lake Forest Park where it joins Lyon Creek and flows to Lake Washington.
Riparian/Buffer Condition	Within Brugger's Bog Park, the stream is surrounded by Wetland A and a forested riparian buffer provides shading and is generally of moderate quality. However, outside of this narrow riparian corridor, the buffer consists of lawn and development. The open segment north of NE 195th Street also has a narrow riparian buffer with adjacent lawn and development. South of NE 195th Street, the stream flows through Wetland B, which provides a forested buffer of generally high quality to the east. The western buffer of the stream is the steep fill slope and gabion wall of Ballinger Way NE. The remainder of the buffer is lawn and development.

IMPACTS ANALYSIS

To be evaluated in Phase II of the project design and development.

MITIGATION

To be evaluated in Phase II of the project design and development.

MAINTENANCE AND MONITORING

To be evaluated in Phase II of the project design and development.

REFERENCES

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRP-DE-4. US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. August 1993.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Publication FWS/OBS-79/31. US Department of the Interior, Fish and Wildlife Service, Office of Biological Services.

Ecology. 2016. Water Quality Assessment for Washington, 303(d) Map Tool. Obtained July 1, 2016 from agency website: <http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi. January 1987.

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region. Technical Report TR-08-13. US Army Corps of Engineers, Engineer Research and Development Center, Wetlands Regulatory Assistance Program, Vicksburg, Mississippi.

Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Department of Ecology, Olympia, WA. Publication #14-06-029. October 2014.

Lake Forest Park, City of. 2009a. Sensitive Areas Map. Obtained July 1, 2016 from agency website: <http://www.cityoflfp.com/DocumentCenter/Home/View/316>.

Lake Forest Park, City of. 2009b. Surface Water Management Plan. Final Report: Part B, Flood Reduction Planning Study for the Lyon Creek and McAleer Creek Drainage Basins. Prepared by Otak, Inc. December 2009.

NRCS. 2016a. Agricultural Applied Climate Information System. US Department of Agriculture, Natural Resources Conservation Service. Obtained June 27, 2016, from agency website: <http://agacis.rcc-acis.org/53057/wets/results>.

NRCS. 2016b. Soil survey geographic database for King County area, Washington. US Department of Agriculture, Natural Resources Conservation Service. Obtained July 1, 2016, from agency website: <http://soildatamart.nrcs.usda.gov>.

NRCS. 2016c. National hydric soils list for the state of Washington. US Department of Agriculture, Natural Resources Conservation Service. Obtained July 1, 2016, from agency website: <http://soils.usda.gov/use/hydric/lists/state.html>.

Olson, P. and E. Stockdale. 2010. Determining the Ordinary High Water mark on Streams in Washington State. Ecology Publication 08-06-001. Washington State Department of Ecology. Revised March 2010.

Shoreline, City of. 2015. Lyon Creek Basin Plan. Prepared by Alta Terra, Osborn Consulting, and The Watershed Company. October 2015.

Shoreline, City of. 2016. Geographic Information System data. Stream and wetland data obtained July 1, 2016 from agency website: <http://maps.shorelinewa.gov/maps/>.

USFWS. 2014. Raster scan data of National Wetlands Inventory wetlands maps. Digital data created in 2016. US Fish and Wildlife Service. Obtained October 28, 2015, from agency website: <http://www.fws.gov/wetlands/index.html>.

USGS. 2016. National Hydrography Dataset Layer for King County, Washington. US Geological Survey. Obtained July 1, 2016, from agency website: <http://nhd.usgs.gov/tools.html>.

Watershed. 2016. Wetland and Stream Delineation Report for the City of Shoreline North Maintenance Facility. The Watershed Company, Kirkland, Washington.

WDF. 1975. A Catalog of Washington Streams and Salmon Utilization. Volume I, Puget Sound Region. Prepared by R.W. Williams, R.M. Laramie, and J.J. Ames for Washington Department of Fisheries, Olympia. November 1975.

WDFW. 2016a. SalmonScape mapping system. Washington Department of Fish and Wildlife. Obtained July 1, 2016, from agency website: <http://wdfw.wa.gov/mapping/salmonscape/index.html>.

WDFW. 2016b. Priority Habitats and Species Database. Provided by Washington Department of Fish and Wildlife. Accessed July 1, 2016. <http://wdfw.wa.gov/conservation/phs/>.

WDNR. 2016. Washington Natural heritage Program. Obtained July 1, 2016, from agency website: <http://www1.dnr.wa.gov/nhp/refdesk/datasearch/>.

APPENDIX A

Wetland Delineation Methods

WETLAND DELINEATION METHODS

The wetland delineation for the 25th Avenue NE Flood Reduction Project was performed in accordance with the Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region (Environmental Laboratory 2010), which is consistent with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987). These methods use a three-parameter approach for identifying and delineating wetlands: the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. This wetland delineation was performed according to procedures specified for the routine wetland determination method (Environmental Laboratory 1987).

HYDROPHYTIC VEGETATION

Hydrophytic vegetation is characterized by the ability to grow, effectively compete, reproduce, and persist in anaerobic soil conditions resulting from periodic or long-term saturation (Environmental Laboratory 1987). Vegetation must meet at least one of the four indicators (described below) that are used to determine the presence of hydrophytic vegetation in wetlands. Problematic and atypical situations for hydrophytic vegetation are also described in the US Army Corps of Engineers delineation manual and supplement (Environmental Laboratory 1987, 2010).

Plant Species Identification

Plant species were identified using *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1987) and *A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon* (Cooke 1997). The indicator status of each plant species is based on the *National Wetland Plant List* (Lichvar 2016) for the Western Mountains, Valleys, and Coast Region.

Dominant Species Determination

Dominant species are those that contribute more than other species to the character of a plant community. To determine dominance, a vegetation sampling area is determined by the field biologist to accurately characterize the plant community that occurs in the area to be evaluated. These are commonly circular sampling areas, centered on the location of the test plot (where soil and hydrologic data is also collected). The radius of the circle is determined in the field, based on site conditions. In large wetlands, a typical sampling radius would be 2 to 5 meters for tree and sapling/shrub species, and 1 meter for herbaceous species. In a small or narrow wetland (or upland), the radius might be reduced to accurately sample wetland (upland) areas,

thereby avoiding an overlap into an adjacent community having different vegetation, soils, or hydrologic conditions (Environmental Laboratory 2010).

Within the vegetation sampling area, a complete list of plant species that occur in the sampling area is compiled and the species divided into four strata: tree, shrub (including saplings, see criteria below), herb, and woody vines. A plant is included in the tree stratum if it is a woody plant 3 inches in diameter at breast height (dbh) or greater; in the shrub stratum if it is a woody plant less than 3 inches dbh (including tree saplings under 3 inches dbh); in the herb stratum if it is an herbaceous (non-woody) plant; and in the woody vine stratum if it is a woody vine of any height (Environmental Laboratory 2010). To be included in the sampling, 50 percent or more of the plant base must be within the radius of the sampling area. For trees specifically, more than 50 percent of the trunk (diameter) must be within the sampling radius to be included.

A rapid test, dominance test (e.g., the 50/20 rule), or prevalence index are commonly used to determine which species are considered dominant and to assess whether the criteria for hydrophytic vegetation are met at each test plot (Environmental Laboratory 2010). Additional hydrophytic vegetation indicators are discussed in the following section.

To conduct a rapid test (Indicator 1 on the wetland determination data form), the dominant species are evaluated visually and if all are FACW or OBL, the vegetation data passes the rapid test. To conduct a dominance test (Indicator 2 on the wetland determination data form), the absolute areal coverage of the plant species within a stratum are totaled, starting with the most abundant species and including other species in descending order of coverage, until the cumulative coverage exceeds 50 percent of the total coverage for the stratum. The plant species that constitute this first 50 percent of areal coverage are considered the dominant species in the stratum. In addition, any other any single plant species that constitutes at least 20 percent of the total percent cover in the stratum is also considered a dominant species (Environmental Laboratory 2010). The indicator status category for each plant (shown in Table A-1) is also listed on the wetland determination form. If more than 50 percent of the dominant species across all strata are rated OBL, FACW, or FAC, the hydrophytic vegetation dominance test (Indicator 2) is met.

The prevalence index (Indicator 3 on the wetland determination data form) is a weighted-average wetland indicator status of all plant species in the sampling plot, where weighting is by abundance (Environmental Laboratory 2010). This method is used where indicators of hydric soil and wetland hydrology are present, but the vegetation initially fails the rapid and dominance tests (Indicators 1 and 2). To determine the prevalence index, the absolute cover of each species in each stratum is determined. All species (across all strata) are organized into wetland indicator status groups (i.e., OBL, FACW, FAC, FACU, or UPL) and their cover values are summed within the groups. The formula for the prevalence index is applied. If the prevalence index (which ranges from 1.0 to 5.0) equals 3.0 or less, this hydrophytic vegetation indicator is met.

Table A-1. Plant Indicator Status Categories.		
Indicator Status	**Indicator Symbol**	**Definition**
Obligate wetland plants	OBL	Plants that occur almost always (estimated probability >99%) in wetlands under natural conditions but also occur rarely (estimated probability <1%) in upland areas
Facultative wetland plants	FACW	Plants that usually occur (estimated probability >67%) in wetlands under natural conditions but also occur (estimated probability 1% to 33%) in upland areas
Facultative plants	FAC	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and upland areas
Facultative upland plants	FACU	Plants that sometimes occur (estimated probability 1% to 33%) in wetlands but occur more often (estimated probability >67% to 99%) in upland areas
Obligate upland plants	UPL	Plants that rarely occur (estimated probability <1%) in wetlands under natural conditions
$WET \longleftarrow OBL - FACW - FAC - FACU - UPL \longrightarrow DRY$		

Source: Environmental Laboratory (1987).

Additional Hydrophytic Vegetation Indicators

The presence of morphological adaptations to wetland conditions in plants that lack a published hydrophytic vegetation indicator status or with an indicator status of FACU or drier is also a hydrophytic vegetation indicator (Indicator 4). Evidence of physiological, morphological, or reproductive adaptations indicating growth in hydrophytic conditions can include, but are not limited to, buttressed roots, adventitious roots, multi-stemmed trunks, or tussocks. To determine whether Indicator 4 is met, the morphological features must be observed on more than 50 percent of the individuals of a FACU species (or species without a published indicator status) living in an area where hydric soil and wetland hydrology are present. On the wetland determination data form, the indicator status of the species with morphological adaptations would be changed to FAC (with supporting notes), and the dominance test (Indicator 2) and/or prevalence index (Indicator 3) would then be recalculated.

Wetland non-vascular plants, referred to as bryophytes and consisting of mosses, liverworts, and hornworts, may also meet the hydric vegetation criteria, under Indicator 5 (Environmental Laboratory 2010). These plants must be present in areas containing hydric soils and wetland hydrology. The percent cover of wetland specialist bryophytes is determined in 10-inch by 10-inch square plots placed at the base of hummocks, if present. The summed cover of wetland specialist bryophytes must be more than 50 percent of the total bryophyte cover in the vegetation sampling area.

The problematic hydrophytic vegetation indicator section in the Corps regional supplement further explains how to interpret situations in which hydric soils and wetland hydrology are present but hydrophytic vegetation Indicators 1 through 5 are lacking (Environmental

Laboratory 2010). Procedures for looking at settings such as areas with active vegetation management (e.g. farms), areas dominated by aggressive invasive species, active floodplains, and low terraces are described, as well as explanations for specific situations, such as seasonal shifts in plant communities, extended drought conditions, and riparian areas.

HYDRIC SOILS

A hydric soil is a soil that is saturated, flooded, or inundated long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Environmental Laboratory 1987, 2010). The evaluation of existing soil maps (developed by NRCS and other sources) is used to understand hydric soil distribution and to identify the likely locations of hydric soils (by verifying their inclusion on the hydric soils list). Comparison of these mapped soils to conditions found on site help verify the presence of hydric soils.

For on-site soils characterization, hydric soils data were obtained generally by digging test pits at least 20 inches deep and 4 inches wide. Hydric soil conditions were evaluated using indicators outlined in *Field Indicators of Hydric Soils in the United States* (NRCS 2006), and adopted by the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010).

Hydric soil indicators applicable to the Western Mountains, Valleys, and Coast region include, but are not limited to, the presence of organic soils (i.e., histosols or histic epipedons); sulfidic material (i.e., hydrogen sulfide); depleted, gleyed, or reduced soil matrices; and/or the presence of iron or manganese concretions (Environmental Laboratory 2010). Soil color characterization (i.e., hue, value, and chroma) is a critical tool in determining depleted, gleyed, and reduced soil conditions. Soil color was evaluated by comparing soil colors at test plots to standardized color samples in *Munsell Soil Color Charts* (Munsell Color 2000).

WETLAND HYDROLOGY

Wetland hydrology is indicated by site conditions that demonstrate the periodic inundation or saturation to the soil surface for a sufficient duration during the total growing season. A *sufficient duration* during the growing season is defined as 14 or more consecutive days of flooding, ponding, or presence of a water table at 12 inches or less from the soil surface (Environmental Laboratory 2010). The growing season is the period of consecutive frost-free days, or the longest period during which the soil temperature stays above biological zero (41°F), when measured at 12 inches below the soil surface.

Two indicators of biological activity can be used to determine whether the growing season has begun and is ongoing (Environmental Laboratory 2010):

- Occurrence of aboveground growth and development of at least two non-evergreen vascular plant species growing within the wetland. Examples of this growth include the emergence or elongation of leaves on woody plants and the emergence or opening of flowers.

- Soil temperature, which can be measured once during a single site visit, should be at least 41°F or higher at a depth of 12 inches.

For this assessment, onsite hydrologic indicators were examined at the test plots. Hydrologic indicators include the presence of surface water, standing water in the test pit at a depth of 12 inches or less, saturation in the root zone, watermarks, drift lines, sediment deposits, drainage patterns within wetlands, oxidized rhizospheres surrounding living roots, and water-stained leaves.

REFERENCES

Cooke, S. 1997. A Field Guide to the Common Wetland Plants of Western Washington and Northwest Oregon. Seattle Audubon Society and Washington Native Plant Society, Seattle, Washington. June 1997.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi. January 1987.

Environmental Laboratory. 2010. Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region. Technical Report TR-08-13. US Army Corps of Engineers, Engineer Research and Development Center, Wetlands Regulatory Assistance Program, Vicksburg, Mississippi.

Hitchcock, C.L. and A. Cronquist. 1987. Flora of the Pacific Northwest. University of Washington Press, Seattle, Washington.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30:1-17. US Army Corps of Engineers. Accessed June 27, 2016. <http://rsgisias.crrel.usace.army.mil/NWPL/>.

Munsell Color. 2000. Munsell Soil Color Charts. New Windsor, New York.

NRCS. 2006. Field Indicators of Hydric Soil in the United States, Version 6.0. Edited by G.W. Hurt and L.M. Vasilas. US Department of Agriculture, Natural Resources Conservation Service, in association with the National Technical Committee for Hydric Soils.

APPENDIX B

Wetland B Delineation Data Sheets and Rating Forms

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

Project/Site: 25th Avenue NE Flood Reduction Project **City/County:** Lake Forest Park/King **Sampling Date:** 31-May-16

Applicant/Owner: City of Shoreline **State:** WA **Sampling Point:** TP-B-UPL

Investigator(s): Shelby Petro, Julia Munger **Section, Township, Range:** S 4 T 26N R 4E

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** flat **Slope:** 0.0 % / 0.0 °

Subregion (LRR): LRR A **Lat.:** 47.003064 **Long.:** 122.301689 **Datum:** WGS84

Soil Map Unit Name: none mapped **NWI classification:** None

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 3 m)			
1. Alnus rubra	50	☑ 100.0%	FAC
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	50	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2 m)			
1. Acer circinatum	80	☑ 88.9%	FAC
2. Rubus armeniacus	5	☐ 5.6%	FAC
3. Rubus spectabilis	5	☐ 5.6%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	90	= Total Cover	
Herb Stratum (Plot size: 1 m)			
1. Equisetum telmateia	2	☐ 2.2%	FACW
2. Ranunculus repens	40	☑ 43.5%	FAC
3. Phalaris arundinacea	50	☑ 54.3%	FACW
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	92	= Total Cover	
Woody Vine Stratum (Plot size: 1 m)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 8

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	**x 1 =**	0
FACW species	52	**x 2 =**	104
FAC species	180	**x 3 =**	540
FACU species	0	**x 4 =**	0
UPL species	0	**x 5 =**	0
Column Totals:	232	**(A)**	644 **(B)**

Prevalence Index = B/A = 2.776

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: TP-B-UPL

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	3/2	100						Loam	
8-16	10YR	3/2	98	10YR	4/4	1	C	M	Loam	
				2.5Y	4/1	1	D	M		
16+										cobble

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: cobble

Depth (inches): 16

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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?	Yes ○	No ◉	Depth (inches):
Water Table Present?	Yes ○	No ◉	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes ○	No ◉	Depth (inches):

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

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

Project/Site: 25th Avenue NE Flood Reduction Project **City/County:** Lake Forest Park/King **Sampling Date:** 31-May-16

Applicant/Owner: City of Shoreline **State:** WA **Sampling Point:** TP-B-WET

Investigator(s): Shelby Petro, Julia Munger **Section, Township, Range:** S 4 T 26N R 4E

Landform (hillslope, terrace, etc.): Channel (active) **Local relief (concave, convex, none):** concave **Slope:** 1.0 % / 0.6 °

Subregion (LRR): LRR A **Lat.:** 47.769553 **Long.:** 122.301592 **Datum:** WGS84

Soil Map Unit Name: none mapped **NWI classification:** None

Are climatic/hydrologic conditions on the site typical for this time of year? Yes ◉ No ○ **(If no, explain in Remarks.)**

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **naturally problematic?** **(If needed, explain any answers in Remarks.)**

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 3 m)			
1. Alnus rubra	60	☑ 60.0%	FAC
2. Salix lucida	40	☑ 40.0%	FACW
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
	100	= Total Cover	
Sapling/Shrub Stratum (Plot size: 2 m)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
	0	= Total Cover	
Herb Stratum (Plot size: 1 m)			
1. Equisetum telmateia	5	☐ 5.0%	FACW
2. Oenanthe sarmentosa	90	☑ 90.0%	OBL
3. Ranunculus repens	5	☐ 5.0%	FAC
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
11.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size: 1 m)			
1.	0	☐ 0.0%	
2.	0	☐ 0.0%	
	0	= Total Cover	

% Bare Ground in Herb Stratum: 0

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	90	x 1 =	90
FACW species	45	x 2 =	90
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	200 (A)		375 (B)

Prevalence Index = B/A = 1.875

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0** [1]
- ☐ **4 - Morphological Adaptations** [1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **5 - Wetland Non-Vascular Plants** [1]
- ☐ **Problematic Hydrophytic Vegetation** [1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: TP-B-WET

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-17	10YR	2/1	95	7.5YR	4/4	5	C	M	Silty Clay Loam	
17-20	10GY	5/1	98	10YR	4/6	20	C	M	Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two 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?	Yes ○	No ◉	Depth (inches):	
Water Table Present?	Yes ◉	No ○	Depth (inches):	10
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland B Date of site visit: 5/31/2016

Rated by Shelby Petro Trained by Ecology? ☑ Yes ☐ No Date of training Mar-15

HGM Class used for rating Depressional & Flats Wetland 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 Bing 2016

OVERALL WETLAND CATEGORY II (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	M	M	M	
Landscape Potential	M	H	L	
Value	H	H	H	**Total**
Score Based on Ratings	7	8	6	**21**

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	**X**

Wetland name or number B

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	B-1
Hydroperiods	D 1.4, H 1.2	B-2
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	B-2
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	B-1
Map of the contributing basin	D 4.3, D 5.3	B-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	B-4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	B-5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	B-6

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 (*can be added to another figure*)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (*can be added to another figure*)	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 (*can be added to another figure*)	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which 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	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

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.*

NOTES and FIELD OBSERVATIONS:

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. ☐ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 3 points = 2 points = 1 points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*).	Yes = 4 No = 0	0
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area Wetland has persistent, ungrazed, plants > ½ of area Wetland has persistent, ungrazed plants > $^1/_{10}$ of area Wetland has persistent, ungrazed plants < $^1/_{10}$ of area	points = 5 points = 3 points = 1 points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland Area seasonally ponded is > ¼ total area of wetland Area seasonally ponded is < ¼ total area of wetland	points = 4 points = 2 points = 0	2
Total for D 1	Add the points in the boxes above	**9**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	**2**

Rating of Landscape Potential If score is: ☐ **3 or 4 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list?	Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?	Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the basin in which the unit is found*)?	Yes = 2 No = 0	0
Total for D 3	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*

Wetland name or number B

DEPRESSIONAL AND FLATS WETLANDS

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

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	2
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire wetland is in the Flats class points = 5	3
Total for D 4 Add the points in the boxes above	**8**

Rating of Site Potential If score is: ☐ **12 - 16 = H** ☑ **6 - 11 = M** ☐ **0 - 5 = L** *Record the rating on the first page*

D 5.0. Does the landscape have the potential to support hydrologic function of the site?	
D 5.1. Does the wetland unit receive stormwater discharges? Yes = 1 No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0	1
Total for D 5 Add the points in the boxes above	**3**

Rating of Landscape Potential If score is: ☑ **3 = H** ☐ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): ● Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 ☐ ● Surface flooding problems are in a sub-basin farther down-gradient. points = 1 ☐ Flooding from groundwater is an issue in the sub-basin. points = 1 ☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why points = 0 ☐ There are no problems with flooding downstream of the wetland. points = 0	2
D 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	0
Total for D 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*

Wetland name or number B

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.*

- ☐ Aquatic bed
- ☐ Emergent
- ☑ Scrub-shrub (areas where shrubs have > 30% cover)
- ☑ Forested (areas where trees have > 30% cover)

4 structures or more: points = 4
3 structures: points = 2
2 structures: points - 1
1 structure: points = 0

If the unit has a Forested class, check if:

- ☑ 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

2

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*).

- ☐ Permanently flooded or inundated
- ☑ Seasonally flooded or inundated
- ☐ Occasionally flooded or inundated
- ☑ Saturated only

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0

- ☑ Permanently flowing stream or river in, or adjacent to, the wetland
- ☐ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ **Lake Fringe wetland** **2 points**
- ☐ **Freshwater tidal wetland** **2 points**

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

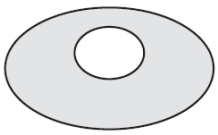
If you counted:
- > 19 species — points = 2
- 5 - 19 species — points = 1
- < 5 species — points = 0

1

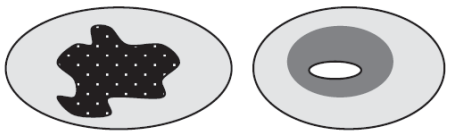
H 1.4. Interspersion of habitats

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

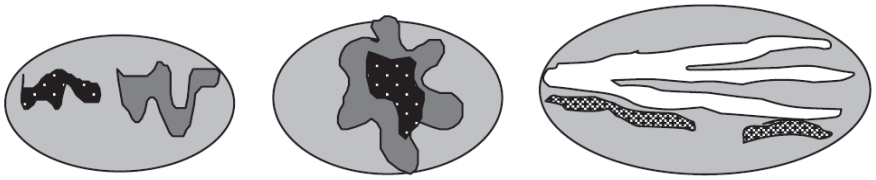


Low = 1 point



Moderate = 2 points

All three diagrams in this row are **HIGH** = 3 points



3

Wetland name or number B

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☑ Standing snags (dbh > 4 in) within the wetland ☑ 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) ☐ 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 (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	3
Total for H 1 Add the points in the boxes above	**11**

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

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

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated*. Site meets ANY of the following criteria: points = 2 ☑ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) with in 100m points = 1 Site does not meet any of the criteria above points = 0	2

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 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 *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	Category
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☑ No = **Not an estuarine wetland**	
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? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ 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 *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☑ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** 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 ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☑ No = **Not WHCV** 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? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** *.* 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? ☐ Yes - Go to **SC 3.3** ☑ No - Go to **SC 3.2** 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? ☐ Yes - Go to **SC 3.3** ☑ No = **Is not a bog** 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? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 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

Does the wetland have at least 1 contiguous acre 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.***

☐ **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.

☐ **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).

☐ Yes = **Category I** ☑ No = **Not a forested wetland for this section**

SC 5.0. Wetlands in Coastal Lagoons

Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?

☐ 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

☐ 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 (*needs to be measured near the bottom*)

☐ Yes - Go to **SC 5.1** ☑ No = **Not a wetland in a coastal lagoon**

SC 5.1. Does the wetland meet all of the following three conditions?

☐ 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).

☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.

☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2)

☐ Yes = **Category I** ☐ No = **Category II**

SC 6.0. Interdunal Wetlands

Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109

☐ Yes - Go to **SC 6.1** ☑ No = **Not an interdunal wetland for rating**

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)?

☐ Yes = **Category I** ☐ No - Go to **SC 6.2**

SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

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?

☐ Yes = **Category III** ☐ No = **Category IV**

Category of wetland based on Special Characteristics

If you answered No for all types, enter "Not Applicable" on Summary Form

Legend

Cowardin class

- Forested
- Scrub-shrub
- 150-ft buffer
- Stream (King County)
- Stream (City of Shoreline)
- City limit

Figure B-1.
Cowardin Classes and 150-Foot Buffer for Wetland B.

N

0 100 200 400 Feet

HERRERA

K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\Appendix\cowardin_class.mxd (7/13/2016)

Legend

Hydroperiods

- Saturated
- Seasonally flooded
- Outlet
- Drainage feature
- Stream (King County)
- Stream (City of Shoreline)

Figure B-2.
Hydroperiods and Outlets for Wetland B.

N

0 100 200 400 Feet

HERRERA

K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\Appendix\hydroperiods.mxd (7/13/2016)

Legend

- Wetland B
- Contributing basin
- City limit
- Stream (City of Shoreline)
- Stream (King County)

Figure B-3.
Map of Contributing Basin to Wetland B.

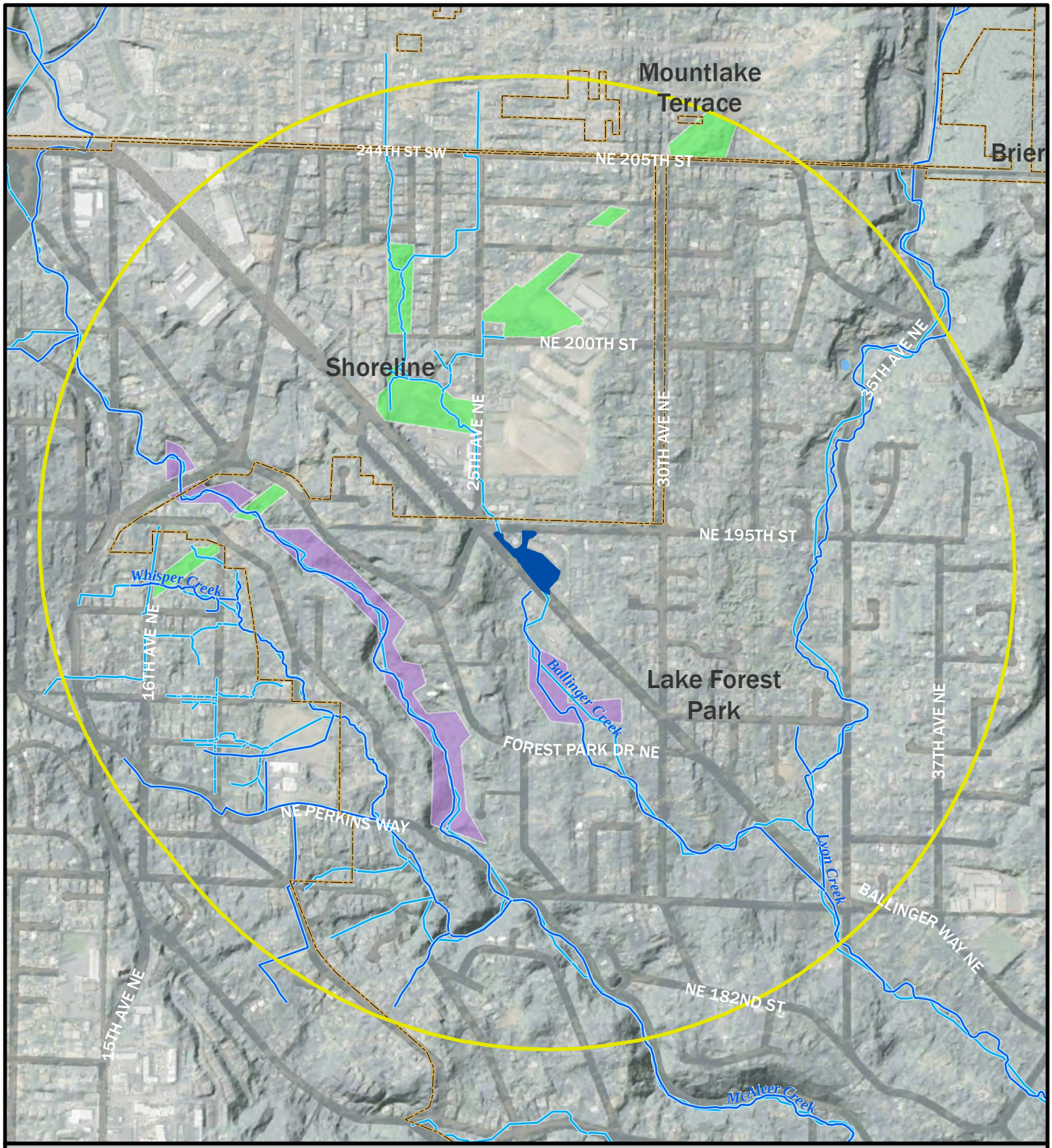
N

0 1,250 2,500 5,000 Feet

HERRERA

USDA, Aerial (2015)

K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\Appendix\contributing_basin.mxd (7/13/2016)



Legend

- Wetland B
- Habitat Type
  - Moderate-Low Intensity
  - Relatively Undisturbed
  - 1-km buffer
- Stream (City of Shoreline)
- Stream (King County)
- City limit

Figure B-4.
Habitat Within 1 Kilometer of Wetland B.

N

0 500 1,000 2,000 Feet

HERRERA

USDA, Aerial (2015)

K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\Appendix\habitat_1km.mxd (7/13/2016)

Legend

- Wetland B
- 303(d) listed water
- Stream (City of Shoreline)
- Stream (King County)
- Park
- City limit

Figure B-5.
303(d) Listed Waters in Basin.

N

0 500 1,000 2,000 Feet

HERRERA

USDA, Aerial (2015)

K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\Appendix\303d.mxd (7/13/2016)

Water Quality Improvement Projects (TMDLs)

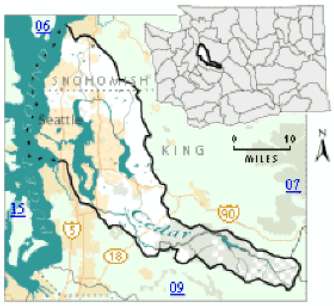
Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 8: Cedar-Sammamish

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- King
- Snohomish



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svricek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svricek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svricek 425-649-7036

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

For more information about WRIA 8:

- Waterbodies in WRIA 8 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 8

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Figure B-6.
TMDLs for WRIA8, Cedar Sammamish.

HERRERA

K:\Projects\Y2016\16-06217-000\Project\Critical_Area_Report\Appendix\TMDLs.mxd (7/8/2016)

APPENDIX C

City of Shoreline Maintenance Facility, Wetland and Stream Delineation Report (The Watershed Company 2016)

September 3, 2013, revised April 18, 2016

Noel Hupprich
Capital Project Manager II
City of Shoreline, Public Works Department
17500 Midvale Avenue N
Shoreline, WA 98133-4905

Re: City of Shoreline Maintenance Facility, Wetland and Stream Delineation Report

The Watershed Company Reference Number: 160329 and 100503

Dear Mr. Hupprich:

On April 13, 2016, I visited Brugger's Bog Park in Shoreline to update the wetland classification using the Department of Ecology *Wetland Rating System for Western Washington, 2014 Update* (Ecology Rating System) as currently required by the City of Shoreline. Prior to recent updates to the Shoreline Critical Areas Regulations, a wetland classification system specific to the City of Shoreline was used for all delineation studies in the City. Similarly, Shoreline has revised its stream classification system to be substantially similar to the Department of Natural Resources Stream Typing System.

The wetland and stream were originally delineated by The Watershed Company on August 22, 2013. The delineation and classification studies have been conducted, in part, to determine the extent of any buffer areas that may encumber the maintenance facility south of the park. Since no wetland or stream features are found within the maintenance facility property, this study focused on the areas south of the stream bridge to the park's southern property line.

This letter summarizes the findings of this study and details applicable federal, state, and local regulations. The following attachments are included:

- Wetland and Stream Delineation Map
- Wetland Determination Data Forms
- Wetland Rating Form

Methods

Public-domain information on the subject properties was reviewed for this delineation study. These sources include USDA Natural Resources Conservation Service Soil maps,

U.S. Fish and Wildlife Service National Wetland Inventory maps, Washington Department of Fish and Wildlife interactive mapping programs (PHS on the Web and SalmonScape), King County's GIS mapping website (iMAP), *City of Shoreline Stream and Wetland Inventory and Assessment* (Tetra Tech/KCM, Inc. 2004), and *The City of Lake Forest Park Surface Water Comprehensive Plan Update* (Otak, Inc. 2009).

Prior to our visit, we conducted a review of the *Brugger's Bog Park, Wetland and Stream Delineation Report* (The Watershed Company, 2011) (2011 Watershed Report), which was prepared as part of a culvert replacement/bridge construction project over Ballinger Creek. The 2011 study focused on areas in the immediate vicinity of the proposed bridge crossing.

The study area was evaluated for wetlands using methodology from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region Version 2.0* (Regional Supplement) (US Army Corps of Engineers [Corps] May 2010). The wetland boundary was determined on the basis of an examination of vegetation, soils, and hydrology. Areas meeting the criteria set forth in the Regional Supplement were determined to be wetland. Soil, vegetation, and hydrologic parameters were sampled at several locations along the wetland boundary to make the determination. Data points on-site are marked with yellow- and black-striped flags. We recorded data at three of these locations.

Delineated wetlands were classified according to the criteria defined in the Shoreline Municipal Code (SMC).

The ordinary high water mark (OHWM) of Ballinger Creek was determined based on the definition provided by the Washington Department of Fish and Wildlife and WAC 220-110-020(69). The OHWM is located by examining the bed and bank physical characteristics and vegetation to ascertain the water elevation for mean annual floods. Areas meeting the definition were determined to be the OHWM and flagged. Field observations were used to classify streams according to the criteria defined in the SMC.

Findings

The study area is located in Brugger's Bog Park, a City of Shoreline municipal park. The park has large lawn areas, a play structure and patchy forested areas that are dominated by a mix of Douglas-fir, western hemlock, western red-cedars, Pacific madrone, and bitter cherry. Salal, Himalayan blackberry, and bracken fern are dominant in the understory. The study area covered those wetlands and streams that could potentially encumber the maintenance facility to the south. There is one wetland, Wetland A (see below), and one stream, Ballinger Creek (see below), located in the study area. There are no wetlands or streams located on the maintenance facility property.

Wetland A

Wetland A is a riverine wetland complex associated with Ballinger Creek. The wetland complex contains three sub-units on alternating sides of Ballinger Creek. Since the sub-units are in very close proximity and mutually influence one another, they are considered one wetland for the purposes of classification/rating. Wetland A contains a forested Cowardin vegetation community. Common vegetation includes black cottonwood, Pacific and Sitka willow, red alder, red-osier dogwood, salmonberry, skunk cabbage, small-fruited bulrush, mannagrass, and creeping buttercup. The soil in Wetland A is a black (10YR 2/1) sandy loam with organic accumulations masking redoximorphic features. Hydrology is provided by a high groundwater table and overbank flooding from Ballinger Creek. Soil saturation was present at the soil surface at our data point location. Other areas in Wetland A contained very shallow surface water during our inspection.

Ballinger Creek

The delineated portion of Ballinger Creek begins at the small, on-site bridge and flows southeast before exiting the property via a culvert at the southeast corner of the park property. The permanently-flowing creek continues southeast for approximately one mile before its confluence with Lyon Creek within the City of Lake Forest Park. Segments of the creek are alternately piped and ditched, and portions flow through braided channels, ponds, and wetlands within Lake Forest Park (*City of Lake Forest Park Surface Water Comprehensive Plan Update*). Several partial fish barriers and two total fish passage barriers are documented downstream of the project area (WDFW *SalmonScape,* 2016). However, downstream portions of Ballinger Creek are documented to contain Coho salmon habitat (WDFW *SalmonScape,* 2016), and resident cutthroat trout cannot be definitively ruled out of the reach within Brugger's Bog Park.

Ditch

An excavated ditch is located adjacent to the southern property line, south of Wetland A and Ballinger Creek. The ditch connects with Ballinger Creek approximately 50 feet upstream from the southeast property corner. The ditch is clearly constructed, as evidenced by its steeply excavated banks and geometrically-straight configuration. No active hydrology was present during our inspection, but water-stained leaves were observed at the bottom of the ditch, suggesting that occasional flooding occurs in the ditch. Despite containing evidence of hydrology and a hydrophytic plant community, the ditch did not satisfy the hydric soil criteria, as no organic matter or redoximorphic features were observed in the soil profile. Furthermore, regulated wetlands in the City of Shoreline do not include "artificial wetlands created entirely from non-wetland sites, including, but not limited to, irrigation and drainage ditches" (SMC 20.80.310.A). It also contains no historic stream flow based physical characteristics, lack of natural upstream channels, overall landscape position and the proximity to Ballinger Creek Therefore, the on-site ditch is not a jurisdictional wetland or stream and does not have an associated buffer.

Local Regulations

Wetlands and streams in Shoreline are regulated under SMC 20.80. Under the code, wetlands are rated as one of four categories based on the Ecology Rating System. According to the Rating System, Wetland A scored seven points for water quality functions, seven points for hydrologic functions, and six points for habitat functions, for a total score of 20 points. This score qualifies Wetland A as a Category II wetland. Wetland buffers in Shoreline are determined based on a combination of the wetland category and the habitat score. Category II wetlands with a habitat score of six points are required to have a standard buffer width of 165 feet (SMC 20.80.330.A.3).

Streams in Shoreline are classified as one of four categories based on inventory status as Shorelines of the State, fish use, and permanence of flow. Ballinger Creek is not considered a Shoreline of the State; therefore, it is not a Type S stream. Streams that are not Type S and have fish use or fish habitat are considered Type F streams. Since Ballinger Creek contains documented Coho salmon habitat downstream of the study area, cutthroat trout cannot be definitively ruled out of the study area; and downstream constructed fish migration barriers could theoretically be removed, the creek satisfies the criteria for a Type F stream with anadromous fish use. Type F streams with anadromous fish use are required to have a standard buffer width of 115 feet (SMC 20.80.280.C.1).

State and Federal Regulations

Wetlands, streams, and some ditches are also regulated by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act. Any filling of Waters of the State, including wetlands (except isolated wetlands), would require notification and permits from the Corps. However, in general, neither the Corps nor Ecology regulates wetland buffers, unless direct impacts are proposed. We understand the proposed project will not result in direct impacts to the wetland, stream, or ditch. Therefore, no state or federal wetland- or stream-related permitting would be triggered by the proposed improvements.

Disclaimer

The information contained in this letter or report is based on the application of technical guidelines currently accepted as the best available science and in conjunction with the manuals and criteria outlined in the methods section. All discussions, conclusions and recommendations reflect the best professional judgment of the author(s) and are based upon information available to us at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, State and Federal regulatory authorities. No other warranty, expressed or implied, is made.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,

Ryan Kahlo, PWS
Ecologist

Enclosures

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LEGEND

- DELINEATED WETLAND BOUNDARY
- 165' STANDARD CATEGORY II WETLAND BUFFER
- 115' STANDARD TYPE F STREAM BUFFER

NOTES

1. CRITICAL AREAS DELINEATED BY THE WATERSHED COMPANY ON AUGUST 22, 2013.
2. SURVEY RECEIVED FROM WHPACIFIC, INC., 425-951-4897.

WETLAND AND STREAM DELINEATION MAP

SCALE 1"=50'

0 25' 50' 100'

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland WA 98033
p 425.822.5242 f 425.827.8136
www.watershedco.com
Science & Design

BRUGGER'S BOG PARK
WETLAND AND STREAM DELINEATION MAP
PREPARED FOR KIM LEHMBERG
SITE ADDRESS:
19827 25TH AVE NE
SHORELINE, WA 98155

SUBMITTALS & REVISIONS

NO.	DATE	DESCRIPTION	BY
1	10-17-13	REVIEW SET	MD
2	4-18-2016	DELINEATION UPDATE	KMB

SHEET SIZE:
ORIGINAL PLAN IS 11X17.
SCALE ACCORDINGLY.

PROJECT MANAGER:	HM
DESIGNED:	--
DRAFTED:	MD
CHECKED:	RK
JOB NUMBER:	100503
SHEET NUMBER:	1 OF 1

DATE	PRINTED BY	FILENAME
10/14/2013	KYLE BRAUN	100503_BRUGGERS BOG WETLAND.DWG

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-1

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **1**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Riverbank** Slope (%) **2**	Local relief (concave, convex, none)	**Concave**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☒ Yes	☐ No
Hydric Soils Present?	☒ Yes	☐ No			
Wetland Hydrology Present?	☒ Yes	☐ No			

Remarks:

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size 5m diam.)			
1. ***Alnus rubra***	**50**	**Yes**	**FAC**
2. ***Salix babylonica****	**50**	**No***	**FACW**
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Cornus sericea***	**25**	**Yes**	**FACW**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**40**	**Yes**	**FACW**
2. ***Phalaris arundinacea***	**10**	**No**	**FACW**
3. ***Ranunculus repens***	**20**	**Yes**	**FACW**
4. ***Oenanthe sarmentosa***	**2**	**No**	**OBL**
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1. ***Convulvulus arvensis***	**70**	**No****	**NI**
2. ***Rubus armeniacus***	**5**	**No**	**FACU**
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**3** (A)
Total Number of Dominant Species Across All Strata:	**3** (B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100** (A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: ***Rooted out of feature – overhanging.**
****NI species not included in dominance calculations.**

SOIL **Sampling Point – DP-1**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	**10YR 2/1**	**100**					**Sandy loam**	

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

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

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

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks: **Organic masking redox**

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 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

Field Observations

Surface Water Present?	☐	Yes	☒	No	Depth (in):		
Water Table Present?	☒	Yes	☐	No	Depth (in):	**14**	
Saturation Present? (includes capillary fringe)	☐	Yes	☐	No	Depth (in):	**Surface**	

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

THE WATERSHED COMPANY
750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-2

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **2**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Terrace** Slope (%) **5**	Local relief (concave, convex, none)	**None**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☐ Yes	☒ No
Hydric Soils Present?	☐ Yes	☒ No			
Wetland Hydrology Present?	☐ Yes	☒ No			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix baylonica***	**90**	**Yes**	**FACW**
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Rosa nutkana***	**10**	**Yes**	**FAC**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**10**	**No**	**FACW**
2. ***Polystichum munitum***	**10**	**No**	**FACU**
3. ***Field grass***	**40**	**Yes**	**FAC***
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Remarks: **Presumed FAC**

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**3**	(A)
Total Number of Dominant Species Across All Strata:	**3**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**100**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL **Sampling Point – DP-2**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	**10YR 2/2**	**100**					**Sandy loam**	
8-12	**10YR 4/2**	**100**					**Sandy loam**	

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

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

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

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☒ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☐ Yes	☒ No	Depth (in):	
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

THE WATERSHED COMPANY

750 Sixth Street South
Kirkland, Washington 98033
(425) 822-5242
watershedco.com

WETLAND DETERMINATION DATA FORM

Western Mountains, Valleys, and Coast Supplement to the 1987 COE Wetlands Delineation Manual

DP-3

Project Site:	**Brugger's Bog Park**	Sampling Date:	**8/22/2013**
Applicant/Owner:	**City of Shoreline**	Sampling Point:	DP- **3**
Investigator:	**Kahlo, R; Lund, N**	City/County:	**Shoreline / King Co.**
Sect., Township, Range	S **4** T **26N** R **4E**	State:	**WA**
Landform (hillslope, terrace, etc)	**Ditch** Slope (%) **2**	Local relief (concave, convex, none)	**Concave**
Subregion (LRR)	**A** Lat	Long / Datum	
Soil Map Unit Name	**No soil data available for this location**	NWI classification	**None**

Are climatic/hydrologic conditions on the site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks.)
Are "Normal Circumstances" present on the site? ☒ Yes ☐ No
Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed?
Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	☒ Yes	☐ No	**Is this Sampling Point within a Wetland?**	☐ Yes	☒ No
Hydric Soils Present?	☐ Yes	☒ No			
Wetland Hydrology Present?	☒ Yes	☐ No			

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size 5m diam.)	Absolute % Cover	Dominant Species?	Indicator Status
1. ***Salix lucida***	**90**	**Yes**	**FACW**
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size 3m diam.)			
1. ***Rubus spectabilis***	**50**	**Yes**	**FAC**
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size 1m diam.)			
1. ***Equisetum telmateia***	**10**	**Yes**	**FACW**
2. ***Ranunculus repens***	**10**	**Yes**	**FACW**
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		
Woody Vine Stratum (Plot size)			
1. ***Rubus armeniacus***	**15**	**Yes**	**FACU**
2.			
	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC:	**4**	(A)
Total Number of Dominant Species Across All Strata:	**5**	(B)
Percent of Dominant Species that are OBL, FACW, or FAC:	**80**	(A/B)

Prevalence Index Worksheet

	Total % Cover of	Multiply by
OBL species		x 1 =
FACW species		x 2 =
FAC species		x 3 =
FACU species		x 4 =
UPL species		x 5 =
Column totals	(A)	(B)

Prevalence Index = B / A =

Hydrophytic Vegetation Indicators

X	Dominance test is > 50%
	Prevalence test is ≤ 3.0 *
	Morphological Adaptations * (provide supporting data in remarks or on a separate sheet)
	Wetland Non-Vascular Plants *
	Problematic Hydrophytic Vegetation * (explain)

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks:

SOIL **Sampling Point – DP-3**

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	**7.5YR 2.5/2**	**100**					**Loam**	
8-12	**2.5Y 3/1**	**100**					**Loamy sand**	

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

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

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

Indicators for Problematic Hydric Soils[3]

- ☐ 2cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)
- ☐

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

Restrictive Layer (if present):
Type: _____
Depth (inches): _____

Hydric soil present? Yes ☐ No ☒

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required):

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A & 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

Field Observations

Surface Water Present?	☐ Yes	☒ No	Depth (in):	
Water Table Present?	☐ Yes	☒ No	Depth (in):	
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (in):	

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Wetland name or number: Wetland A

RATING SUMMARY – Western Washington

Name of wetland (or ID Wetland A): Date of site visit: 4/11/2016

Rated by: Kahlo, R Trained by Ecology? ☒Y ☐N Date of training: 9/2014

HGM Class used for rating: Riverine Wetland has multiple HGM classes? ☒Y ☐N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.
Source of base aerial photo/map: King County iMAP and Google Earth

OVERALL WETLAND CATEGORY (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
- ☐ **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	H **M** L	H **M** L	
Landscape Potential	**H** M L	**H** M L	H M **L**	
Value	**H** M L	**H** M L	**H** M L	**TOTAL**
Score Based on Ratings	8	8	6	22

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	**I** **II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I** **II**
Interdunal	**I** **II** **III** **IV**
None of the above	☒

Wetland name or number: Wetland A

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 (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	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	1
Hydroperiods	H 1.2	1
Ponded depressions	R 1.1	1
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	2
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	2
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	2
Map of the contributing basin	R 2.2, R 2.3, R 5.2	4
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	3
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	6

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 *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which 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	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

Wetland name or number: Wetland B

HGM Classification of Wetlands in Western Washington

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

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

Wetland name or number: Wetland B

☐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: Wetland B

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?	
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions cover > 3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	4
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) Trees or shrubs > 2/3 area of the wetland points = 8 Trees or shrubs > 1/3 area of the wetland points = 6 **Herbaceous plants (> 6 in high) > 2/3 area of the wetland points = 6** Herbaceous plants (> 6 in high) > 1/3 area of the wetland points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland points = 0	6
Total for R 1 Add the points in the boxes above	10

Rating of Site Potential If score is: ☐**12-16 = H** ☒**6-11 = M** ☐**0-5 = L** *Record the rating on the first page*

R 2.0. Does the landscape have the potential to support the water quality function of the site?	
R 2.1. Is the wetland within an incorporated city or within its UGA? Yes = 2 No = 0	2
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area? Yes = 1 No = 0	1
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years? Yes = 1 No = 0	0
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4 Other sources_____ Yes = 1 No = 0	0
Total for R 2 Add the points in the boxes above	4

Rating of Landscape Potential If score is: ☒**3-6 = H** ☐**1 or 2 = M** ☐**0 = L** *Record the rating on the first page*

R 3.0. Is the water quality improvement provided by the site valuable to society?	
R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? Yes = 1 No = 0	1
R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? Yes = 1 No = 0	1
R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage in which the unit is found*) Yes = 2 No = 0	0
Total for R 3 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*

Wetland name or number: Wetland B

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

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

R 4.1. Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* If the ratio is more than 20 points = 9 If the ratio is 10-20 points = 6 If the ratio is 5-<10 points = 4 If the ratio is 1-<5 points = 2 If the ratio is < 1 points = 1	4
R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes).* Forest or shrub for > 1/3 area OR emergent plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR emergent plants > 1/3 area points = 4 Plants do not meet above criteria points = 0	7
Total for R 4 Add the points in the boxes above	11

Rating of Site Potential If score is: ☐**12-16 = H** ☒**6-11 = M** ☐**0-5 = L** *Record the rating on the first page*

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

R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = 0 No = 1	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0	1
R 5.3. Is the up-gradient stream or river controlled by dams? Yes = 0 No = 1	1
Total for R 5 Add the points in the boxes above	3

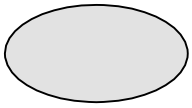
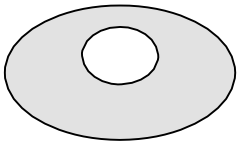
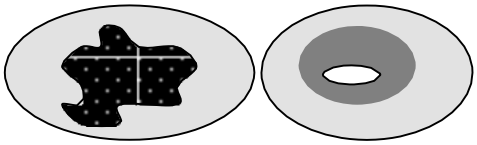
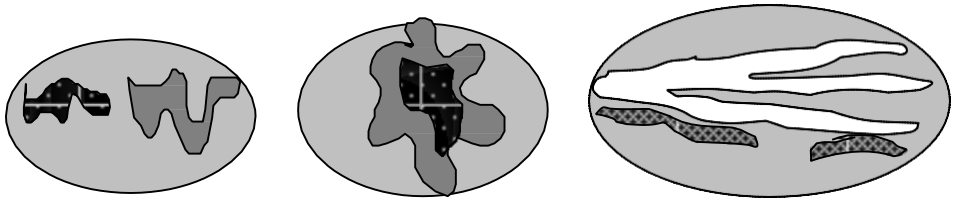
Rating of Landscape Potential If score is: ☒**3 = H** ☐**1 or 2 = M** ☐**0 = L** *Record the rating on the first page*

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

R 6.1. Distance to the nearest areas downstream that have flooding problems? *Choose the description that best fits the site*. The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	2
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for R 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*

Wetland name or number: Wetland B

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.* ☐ Aquatic bed — 4 structures or more: points = 4 ☐ Emergent — 3 structures: points = 2 ☐ Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 ☒ Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ☒ 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	1
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*). ☐ Permanently flooded or inundated — 4 or more types present: points = 3 ☐ Seasonally flooded or inundated — 3 types present: points = 2 ☒ Occasionally flooded or inundated — 2 types present: points = 1 ☒ Saturated only — 1 type present: points = 0 ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland **<u><10%</u>** ☐ **Lake Fringe wetland** — **2 points** ☐ **Freshwater tidal wetland** — **2 points**	1
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold 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 — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	2
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 All three diagrams in this row are **HIGH** = 3points 	0

Wetland name or number: Wetland B

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☒ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). ☒ Standing snags (dbh > 4 in) within the wetland ☒ 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) ☐ 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 *(cut shrubs or trees that have not yet weathered where wood is exposed)* ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☒ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	4
Total for H 1 Add the points in the boxes above	8

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat: **0+** [(% moderate and low intensity land uses)/2]: **0 =0%** If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat: **4 +** [(% moderate and low intensity land uses)/2]: **0 = 4%** Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	0
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
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*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 ☒ It has 3 or more priority habitats within 100 m (see next page) ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) ☐ It is mapped as a location for an individual WDFW priority species ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	2

Rating of Value If score is: ☒**2 = H** ☐**1 = M** ☐**0 = L** *Record the rating on the first page*

Wetland name or number: Wetland B

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 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.

Wetland name or number: Wetland B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐Yes –Go to **SC 1.1** ☒No= **Not an estuarine wetland**	
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? ☐Yes = **Category I** ☐No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ 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 *Spartina*, see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐Yes = **Category I** ☐No= **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐Yes **– Go to SC 2.2** ☒No **– Go to SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐Yes **= Category** I ☐No **= Not a WHCV** 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 ☐Yes **– Contact WNHP/WDNR and go to SC 2.4** ☒No **= Not a WHCV** 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? ☐Yes **= Category I** ☐No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** 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? ☐Yes – Go to **SC 3.3** ☒No – Go to **SC 3.2** 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? ☐Yes – Go to **SC 3.3** ☒No = **Is not a bog** 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? ☐Yes = **Is a Category I bog** ☐No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐Yes = **Is a Category I bog** ☐No **= Is not a bog**	**Cat. I**

Wetland name or number: Wetland B

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre 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.*** ☐ **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. ☐ **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). ☐Yes **= Category I** ☒No **= Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ 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 ☐ 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 *(needs to be measured near the bottom)* ☐Yes – Go to **SC 5.1** ☒No = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? ☐ 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). ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un- mowed grassland. ☐ The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) ☐Yes = **Category I** ☒No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: ☐ Long Beach Peninsula: Lands west of SR 103 ☐ Grayland-Westport: Lands west of SR 105 ☐ Ocean Shores-Copalis: Lands west of SR 115 and SR 109 ☐Yes – Go to **SC 6.1** ☒No = **not an interdunal wetland for rating** 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)? ☐Yes = **Category I** ☐No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? ☐Yes = **Category II** ☐No – Go to **SC 6.3** 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? ☐Yes = **Category III** ☐No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	NA

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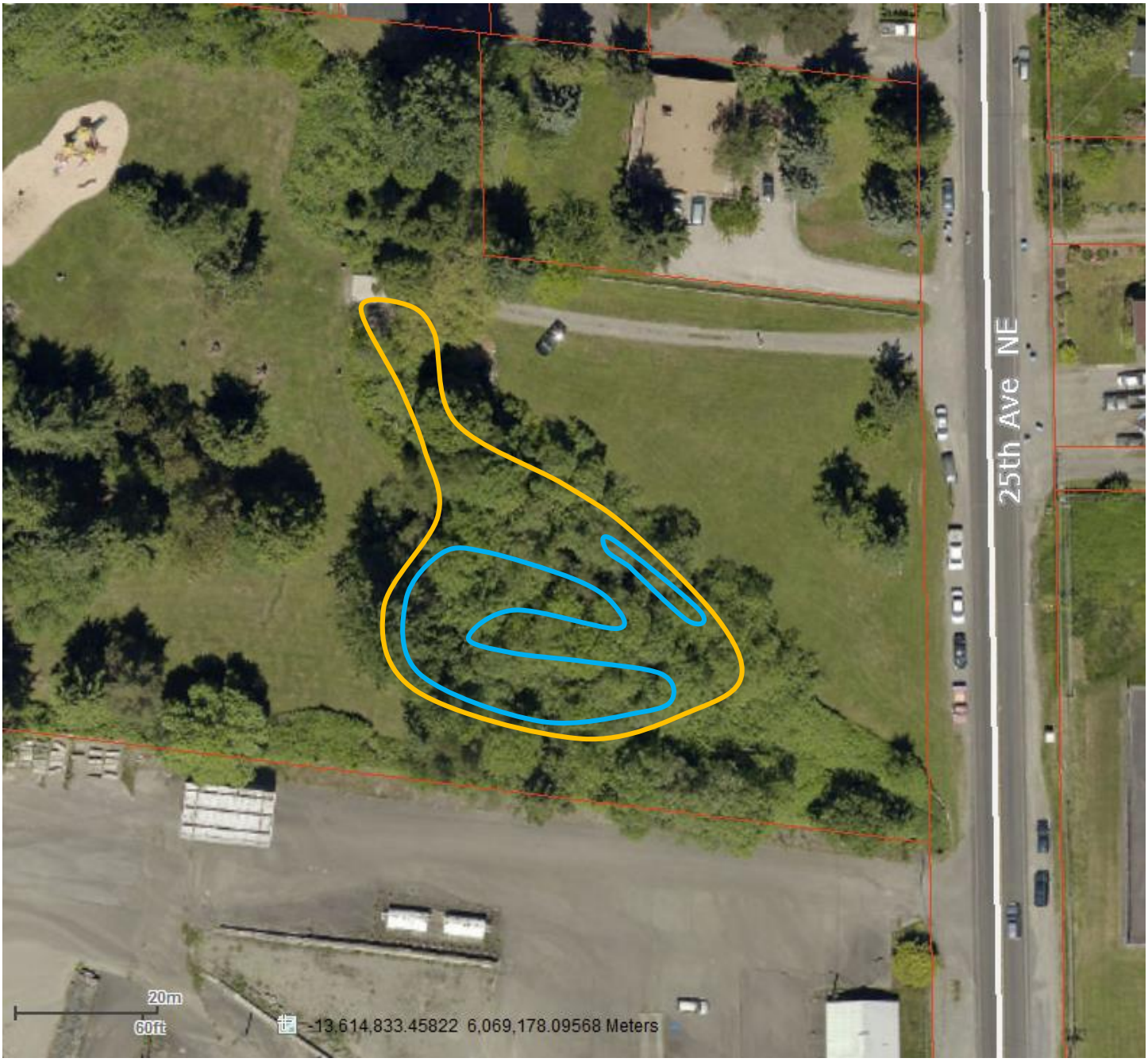


Figure 1: H1.1, H1.4, H1.2, H1.1

Forested / Saturated Only

Ponded Depressions / Occasionally flooded

Stream present but it comprises less than 10% of wetland.

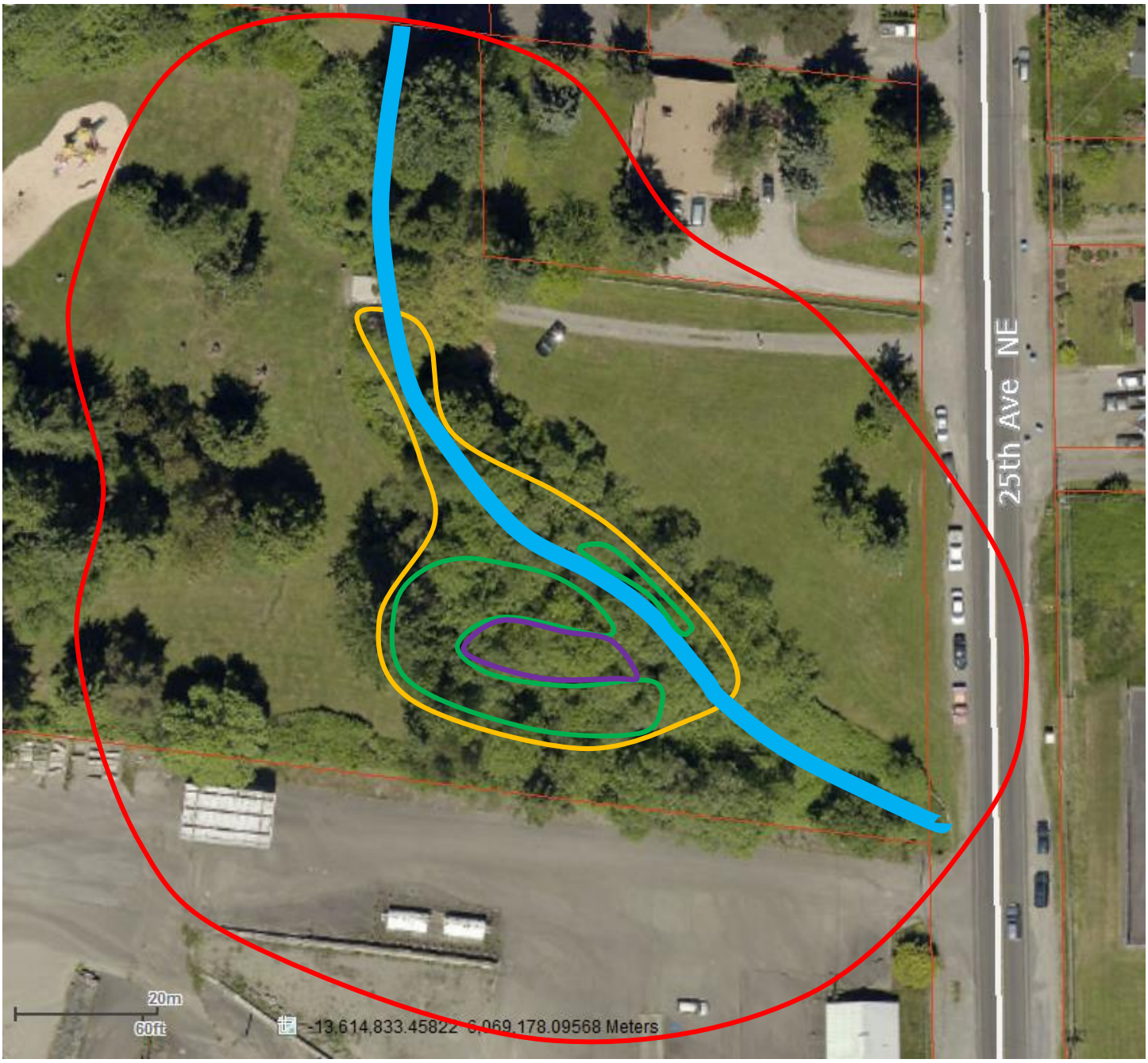


Figure 2: R2.4, R1.2, R4.2, R4.1

Areas of dense tree and shrub

Areas of dense emergent

150-foot buffer

Stream

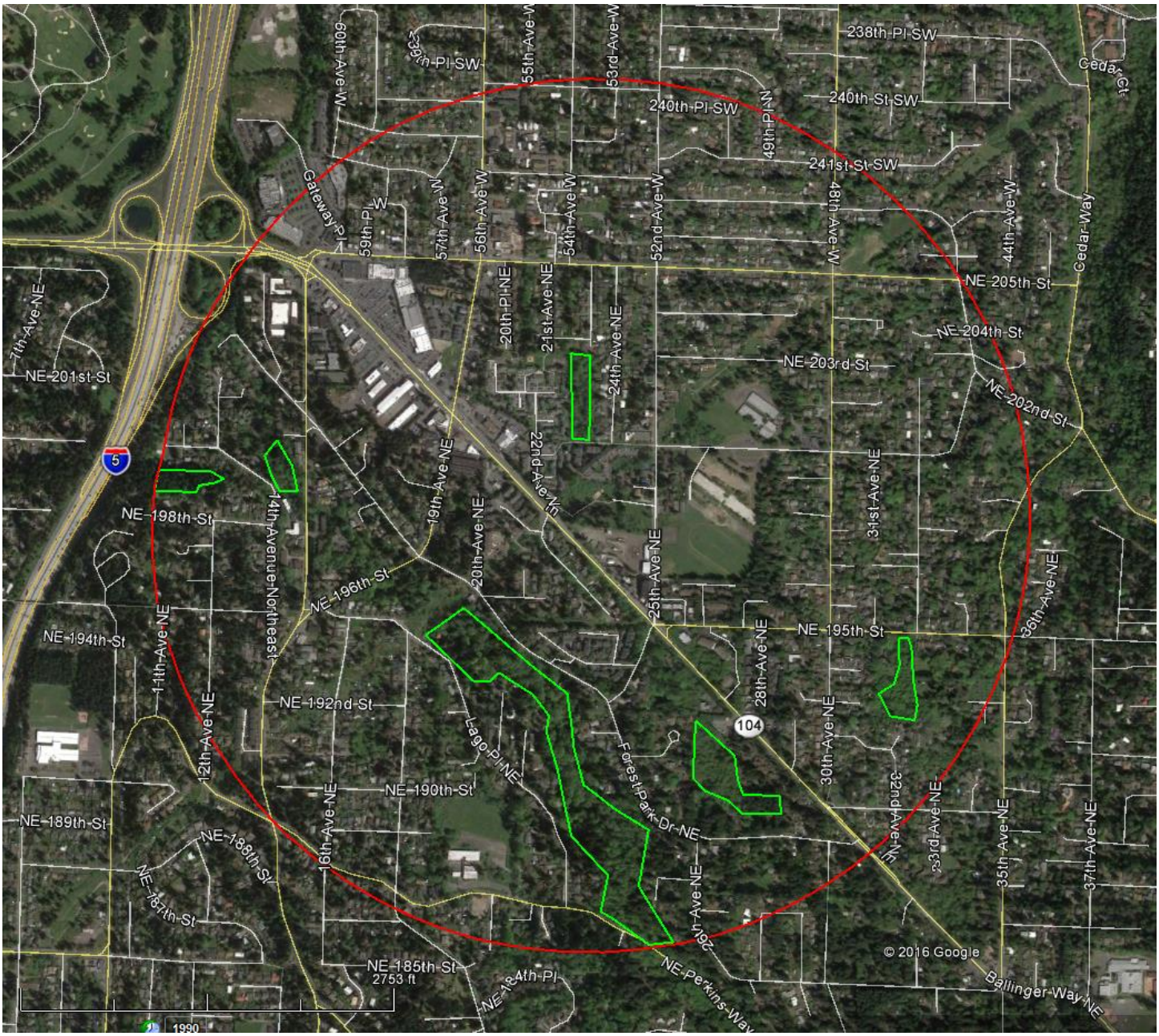


Figure 3: H2.1, H2.2

1km radius

Relatively undisturbed habitat

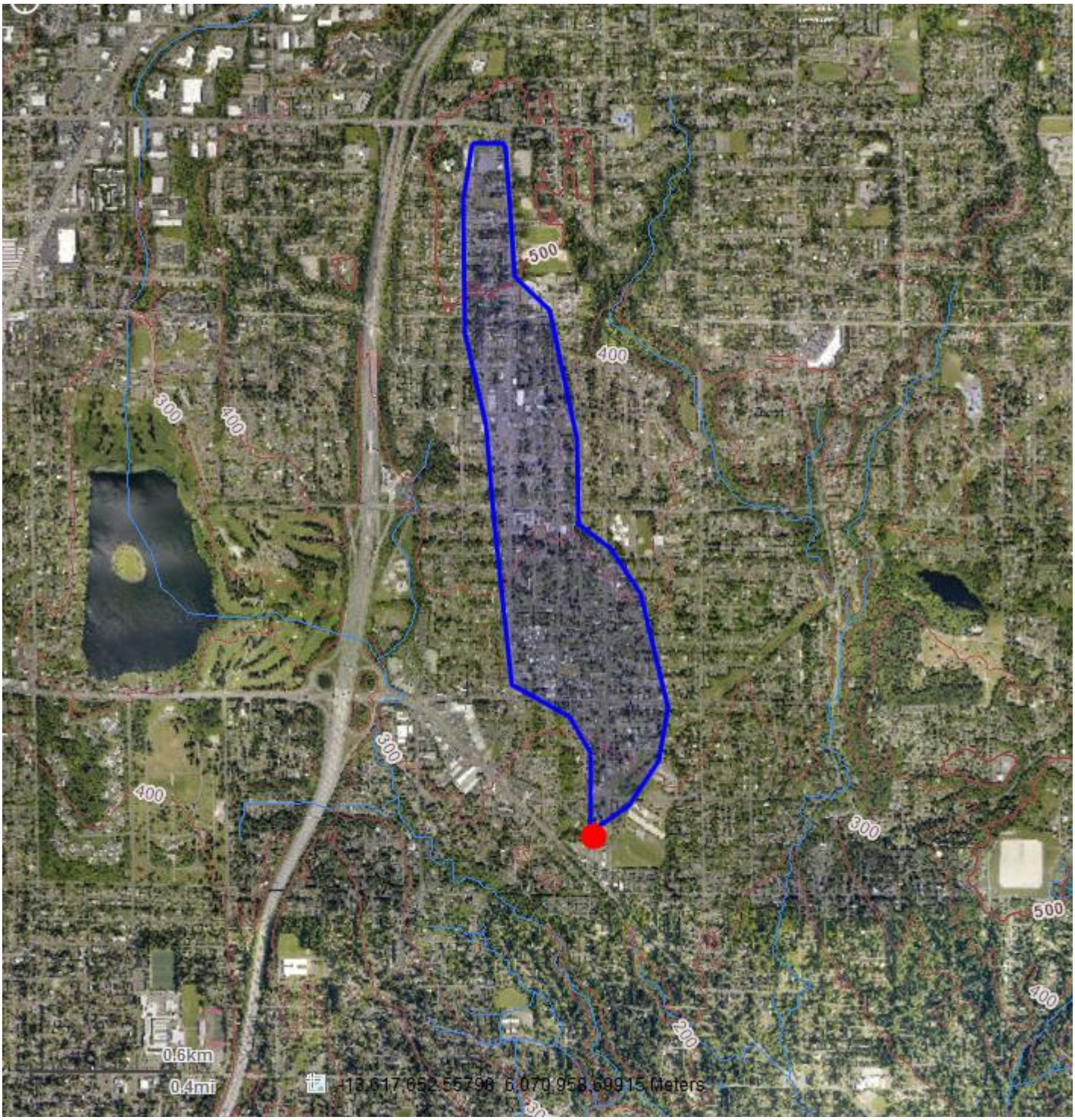


Figure 4: R2.2, R5.2

Contributing basin

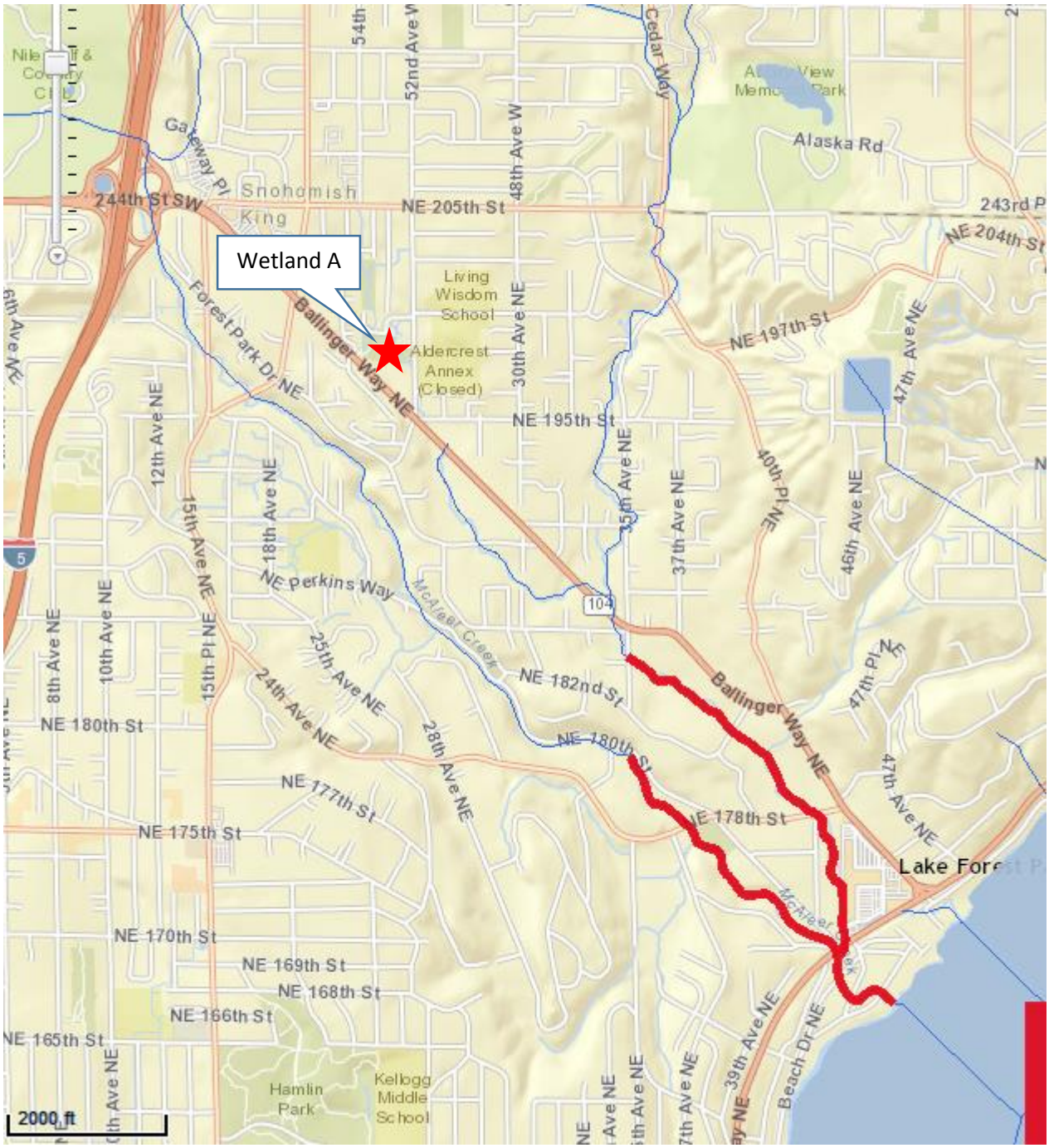
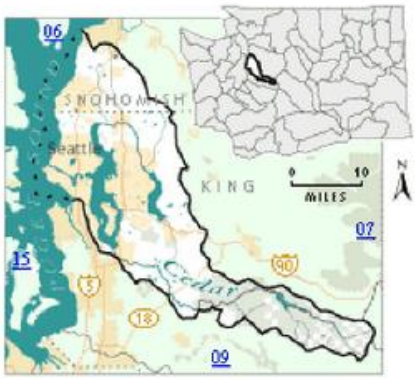

Wetland A
Snohomish
King
244th St SW
NE 205th St
Alaska Rd
Living Wisdom School
Aldercrest Annex (Closed)
Ballinger Way NE
Forest Park Dr NE
NE 195th St
NE 197th St
NE 204th St
NE Perkins Way
McAleer Creek
NE 182nd St
NE 180th St
NE 178th St
NE 177th St
NE 175th St
NE 170th St
NE 169th St
NE 168th St
NE 166th St
NE 165th St
Lake Fore
Hamlin Park
Kellogg Middle School
2000 ft

Figure 5: R3.1

Water Quality Improvement Projects (TMDLs)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.



Counties

- King
- Snohomish

Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform Dissolved Oxygen Temperature	Approved by EPA Approved by EPA	Joan Nolan 425-649-4425
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrjcek 425-649-7036
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Field work starts summer 2015	Ralph Svrjcek 425-649-7036
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrjcek 425-649-7036

** ***Status*** *will be listed as one of the following: Approved by EPA, Under Development or Implementation*

Figure 6: R3.2, 3.3