



Bus Base North

Bus Base North Ecosystems Resources and Wetland Delineation Technical Memorandum

June 2020

Consultant Quality Control Form

Version	Title	Date	Originator/ Drafted by	Reviewed by	Approved by	Notes, as required
0	Bus Base North Draft Ecosystem Resources and Wetland Delineation Report	September 27, 2019	Jessica Redman (ESA and Associates)	Sharese Graham (Task Lead) Larissa King Rawlins (Task Lead) Ed Reynolds (technical edit)	Chris Wellander	Initial Draft
1	Bus Base North Draft Ecosystem Resources and Wetland Delineation Report	December 2, 2019	Jessica Redman (ESA and Associates)	Sharese Graham (Task Lead) Larissa King Rawlins (Task Lead) Ed Reynolds (technical edit)	Chris Wellander	Second draft responding to Sound Transit comments
2	Bus Base North Draft Ecosystem Resources and Wetland Delineation Report	June 17, 2020	Jessica Redman (ESA and Associates)	Sharese Graham (Task Lead) Larissa King Rawlins (Task Lead) Ed Reynolds (technical edit)	Chris Wellander	Final version

Summary

As was identified in the *Sound Transit 3 (ST3) System Plan* (Sound Transit 2016), Sound Transit is planning for a new bus operations and maintenance facility (Bus Base North [BBN]) located near the Interstate 405/State Route 522 corridors to service vehicles across Sound Transit's bus service lines (i.e., bus rapid transit and ST Express bus). The purpose of this *Ecosystems Resources and Wetland Delineation Technical Memorandum* is to support the project's environmental review phase by identifying wetlands, streams, fish and wildlife habitat areas, and other critical areas within the study area of the analysis.

Currently the site is an undeveloped and graded fill pad that has been regularly mowed and maintained. Within the 500-foot study area (shown in Figure 5-1) two wetlands and one stream, a tributary to North Creek, were identified on-site and five wetlands and one stream were assessed off-site. Some mature trees occur along the southern border of the site but, in general, the site provides very little habitat. No other critical areas (i.e., fish and wildlife habitat areas, critical aquifer recharge areas, frequently flooded areas, geological hazards) occur on-site. Off-site, within the study area, the only critical area identified is a small area designated as a steep slope. Additionally, no state or federally listed plant or animal species are mapped as occurring within the site or within the vicinity of the site, and none were observed during site visits.

Prior to construction, the site would be cleared and grubbed to remove existing vegetation not intended to be protected (i.e., outside of wetland and wetland buffer areas). Construction activities would not occur outside of the parcel. Therefore, no direct or indirect impacts to critical areas outside of the BBN parcel are anticipated. The potential for temporary soil erosion during clearing and grading activities would be minimized with adherence to best management practices approved by the Washington State Department of Ecology and the City of Bothell.

Post-construction, the site would be largely developed. To accommodate the proposed building and site improvements, the two on-site wetlands are anticipated to be filled. Permanent impacts to wetlands and wetland buffers would be mitigated according to local, state, and federal standards. If the required mitigation cannot be performed on-site, Sound Transit may opt to purchase credits from an approved mitigation bank within Water Resource Inventory Area 8 if approved by the City of Bothell. Mitigation banking is first in the mitigation hierarchy and preferred by the U.S. Army Corps of Engineers, followed by in-lieu fee programs, followed by permittee-responsible mitigation. However, in discussions with the City of Bothell, it is its preference that a permittee-responsible approach be used. Sound Transit is currently assessing possible mitigation sites within the same subbasin in the City of Bothell limits and will continue to coordinate with the city on a preferred mitigation strategy before submitting permitting applications.

Table of Contents

1	INTRODUCTION.....	1
1.1	Purpose of report.....	2
2	PROJECT DESCRIPTION.....	3
2.1	On-site facilities	3
2.1.1	Maintenance and operations building	3
2.1.2	Bus storage and elevated parking deck.....	6
2.1.3	Security guard house.....	6
2.1.4	Fuel and wash buildings	6
2.2	Utilities and site access	7
2.3	Site work.....	7
2.3.1	Operations	8
3	REGULATORY CONTEXT.....	9
3.1	Federal	9
3.1.1	Wetlands and Streams	9
3.2	State	9
3.2.1	Wetlands and Streams	9
3.3	Local.....	10
3.3.1	Wetlands.....	10
3.3.2	Streams	11
4	METHODOLOGY.....	14
4.1	Study area	14
4.2	Data sources	14
4.2.1	Jurisdictional delineation.....	15
4.3	Impacts assessment.....	16
4.3.1	Construction impacts	16
4.3.2	Long-term impacts	17
5	EXISTING CONDITIONS.....	17
5.1	Selected study area.....	17
5.2	Habitat description.....	17
5.3	Wetlands	18
5.4	Streams	19
5.5	Other critical areas	20

6 ENVIRONMENTAL IMPACTS..... 21

6.1 Construction impacts 21

6.2 Long-term impacts..... 22

6.2.1 Wetlands..... 22

6.2.2 Streams 23

6.2.3 Other critical areas..... 23

7 MITIGATION MEASURES..... 23

7.1 Construction impacts 23

7.2 Long-term impacts..... 23

8 REFERENCES..... 25

Figures

Figure 1-1 Bus Base North project vicinity..... 1

Figure 2-1 Bus Base North – Preliminary ground-level site plan 4

Figure 2-2 Bus Base North– Second-level site plan 5

Figure 5-1 Wetlands and streams within the study area..... 19

Figure 5-2 Mapped steep slopes within the study area 21

Tables

Table 2-1 Typical daily operations – arrivals and departures 8

Table 3-1 Wetland categories and buffer standards for City of Bothell 11

Table 3-2 Stream buffer standards for City of Bothell..... 12

Table 5-1 Wetland rating and applicable buffer distances..... 18

Table 6-1 Wetland and wetland buffer impacts 23

Table 7-1 Wetland mitigation ratios 24

Appendices

Appendix A Bus Base North Wetland and Stream Delineation Report

Acronyms and Abbreviations

BBN	Bus Base North
BMC	Bothell Municipal Code
BMP	best management practices
BRT	bus rapid transit
CARA	Critical Aquifer Recharge Area
Corps	U.S. Army Corps of Engineers
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
GIS	geographic information system
GPS	Global Positioning System
NWP	Nationwide Permit
OHWM	Ordinary High Water Mark
Project	Bus Base North
SR	State Route
ST3	Sound Transit 3
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administration Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

As was identified in the *Sound Transit 3 (ST3) System Plan* (Sound Transit 2016), Sound Transit is planning for a new bus operations and maintenance facility (Bus Base North [BBN]) located near the Interstate I-405/State Route (SR) 522 corridors to service vehicles operating on the I-405 and SR 522/NE 145th bus rapid transit (BRT) lines and ST Express buses. The site identified for development of the BBN project is in the Canyon Park Subarea of Bothell along 20th Avenue SE, as shown in **Figure 1-1**.



Figure 1-1 Bus Base North project vicinity

The BBN project would provide support for up to 80 articulated (60 feet in length) and 40 double-decker or standard transit coaches (40 feet in length). The fleet would primarily be diesel/electric hybrid buses, but approximately 10 of the buses would operate with battery-electric propulsion when the project opens. The facility would be configured to allow for the future potential conversion of the bus fleet to battery-electric buses if Sound Transit determines that to be an appropriate vehicle technology. The BBN project would include construction of the following:

- A maintenance and operations building
- Storage/parking for the 120 buses at ground level
- An aboveground, second-story parking deck to be provided for all employee and visitor parking, which would also provide cover for the bus parking area below
- A security guard house at the bus entrance gate to ensure that all vehicles entering the bus traffic areas have authorization to enter
- A bus wash building to accommodate a fully enclosed, two-bay, drive-through bus wash operation
- A fueling facility, including a support systems building and canopy-covered fueling lanes
- Stormwater facilities as needed to address regulatory and design requirements
- Utility and street connections

Sound Transit is expected to select a design/build contractor for the project in 2021. Following selection, the design/build contractor would develop the detailed construction documents for the project and permit applications would be submitted to the City of Bothell and other permitting agencies. Construction is anticipated to start in 2021 and to be completed in 2023 prior to the start of BRT services in 2024.

1.1 Purpose of report

The purpose of this *Ecosystems Resources and Wetland Delineation Technical Memorandum* is to support the project's environmental review phase by identifying wetlands, streams, fish and habitat areas, and other critical areas within the BBN site and immediate vicinity. The work was limited to a review of existing sources and field investigations conducted in April and June 2019.

2 PROJECT DESCRIPTION

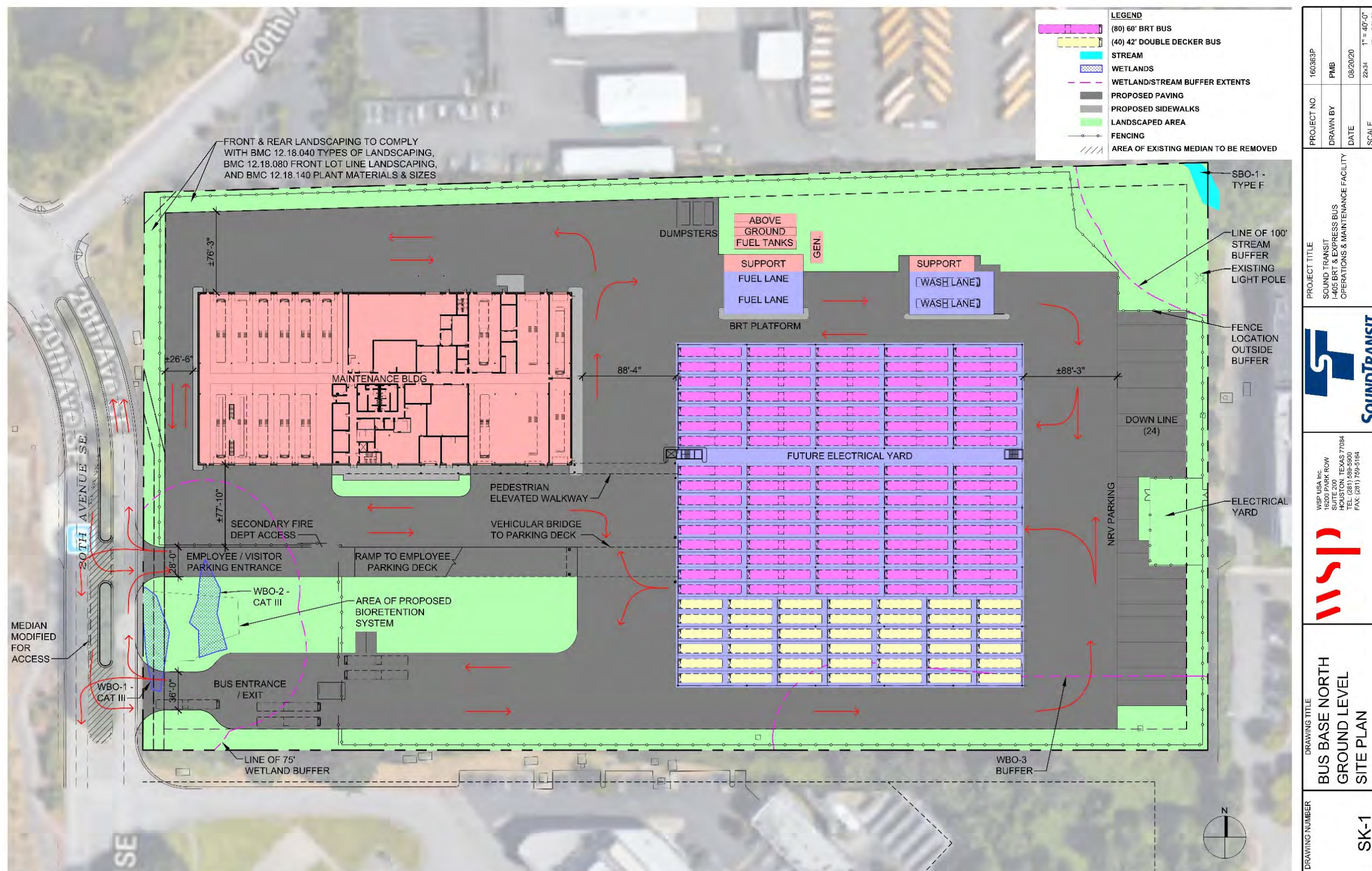
The BBN facility is a bus operations and maintenance facility on a 12.5-acre site, programmed and sized to maintain, service (including fuel and wash), and store up to 120 buses. These buses include the fleet that would operate on the proposed I-405 and SR 522/NE 145th BRT lines, as well as ST Express buses from existing lines of bus service. The site plan and layout of the facility are based on a conceptual level of design. These site plans are shown in **Figure 2-1** and **Figure 2-2**.

2.1 On-site facilities

The following provides a description of the proposed facilities on-site and information on the construction materials that may be used.

2.1.1 Maintenance and operations building

As shown in the conceptual site plans, the maintenance and operations building would be the primary structure on-site with a total building footprint of approximately 58,000 square feet. The maintenance and operations building would include two levels. The first floor is anticipated to include approximately 57,000 square feet of floor area, and the second floor is anticipated to include approximately 19,000 square feet of floor area, for a total floor area of approximately 76,000 square feet. The ground level is expected to house shop and maintenance bay functions and maintenance offices, while the operations offices, dispatch areas, driver areas, and administrative functions would be located on the second floor. The building would also include an enclosed paint booth (for vehicle touch ups, damage repairs, and full coach repainting) designed in accordance with regulatory requirements.





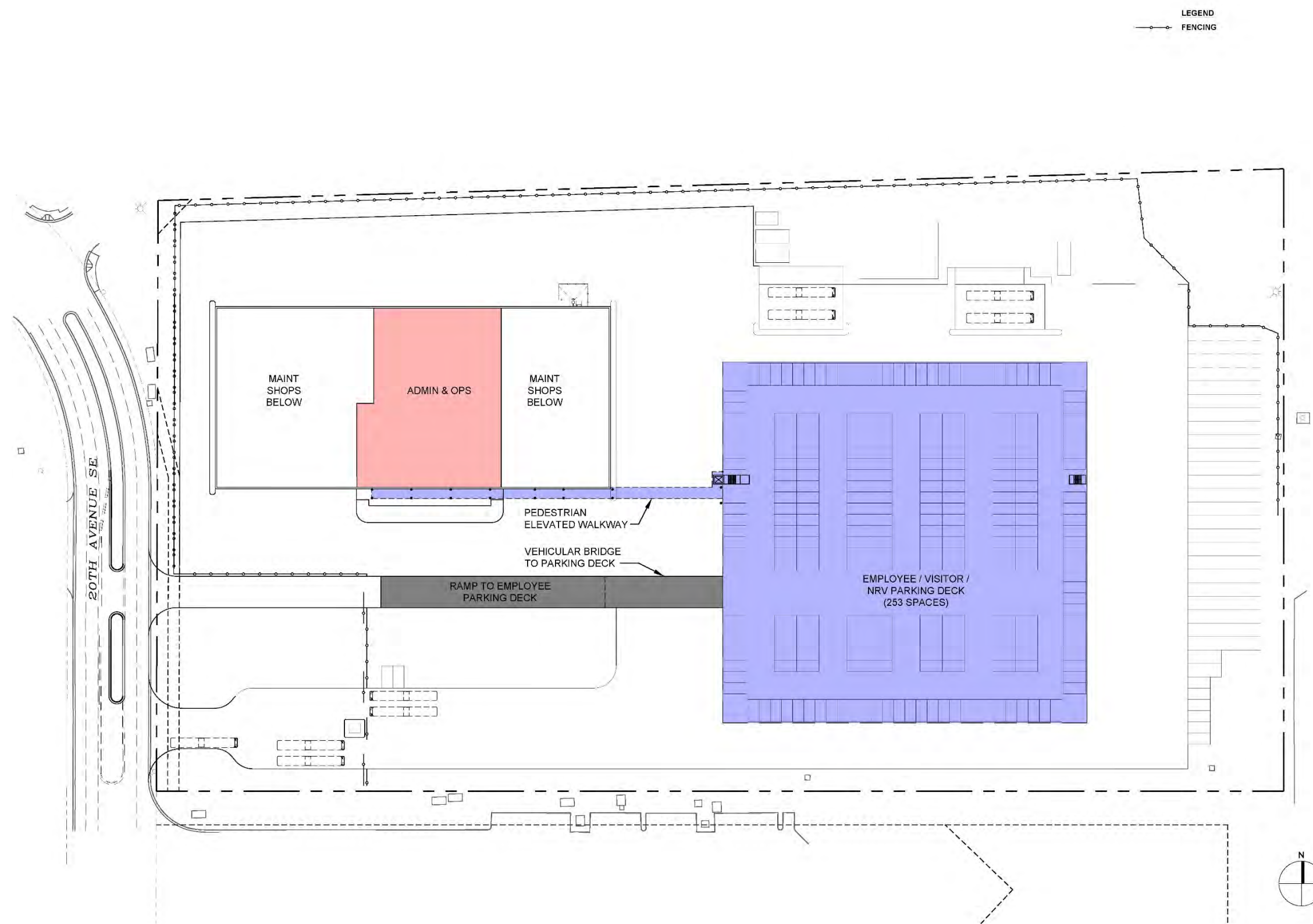
PROJECT NO.	160363P
DRAWN BY	PMB
DATE	08/20/20
SCALE	1" = 40'-0" 11" X 17" 1" = 80'-0"
PROJECT TITLE	SOUND TRANSIT I-405 BRT & EXPRESS BUS OPERATIONS & MAINTENANCE FACILITY
	
	
<small>WSP USA, Inc. 18200 PARK ROW SUITE 200 HOUSTON, TEXAS 77084 TEL: (281) 589-9900 FAX: (281) 759-5164</small>	
DRAWING TITLE	BUS BASE NORTH GROUND LEVEL SITE PLAN
DRAWING NUMBER	SK-1

Figure 2-1 Bus Base North – Preliminary ground-level site plan



LEGEND
FENCING



DRAWING NUMBER	SK-2
DRAWING TITLE	BUS BASE NORTH 2ND LEVEL SITE PLAN
	
WSP USA, Inc. 10000 W. RICHWOOD SUITE 200 HOUSTON, TEXAS 77064 TEL: (281) 580-5600 FAX: (281) 750-5164	
	
PROJECT TITLE	SOUND TRANSIT I-405 BRT & EXPRESS BUS OPERATIONS & MAINTENANCE FACILITY
PROJECT NO.	160363P
DRAWN BY	PMB
DATE	04/09/20
SCALE	25x34 1" = 40'-0" 11x17 1" = 80'-0"

Figure 2-2 Bus Base North– Second-level site plan

2.1.2 Bus storage and elevated parking deck

Storage/parking for the 120 buses would occur on the ground level in the eastern portion of the site, set back from 20th Avenue SE. Access to the bus parking area would be from a bus-only entrance/exit driveway from 20th Avenue SE along the southern property boundary. The bus parking area includes space for the electrical charging infrastructure that would be needed for the potential future conversion to a battery-electric bus fleet.

Above the ground-level bus parking area, a second-story parking deck with approximately 250 parking stalls and approximately 105,000 square feet in area, would be provided for employee and visitor parking and non-revenue vehicles (vehicles used by staff for service and other non-customer transportation uses). This parking deck would cover the bus parking area and would provide weather protection for the parked buses, an overhead structure to attach lighting for the bus parking area, and a structure to attach potential future overhead electric charging equipment. Automobile access to the parking deck would be from a second driveway from 20th Avenue SE, just north of the bus entrance/exit driveway, to a dedicated drive and ramp. The parking deck would likely include an elevated pedestrian walkway directly into the second floor of the maintenance and operations building and would also include an elevator and egress stairs, as required by code, to provide pedestrian access to the ground-level bus parking area below.

2.1.3 Security guard house

An approximately 100-square-foot security building would be located at the bus entrance/exit driveway to monitor access and help control the ingress and egress of buses at the site. Entrance and exit gates would be located on each side (to the north and south) of the security building. Two security guard parking spaces would be provided just northeast of the security building.

2.1.4 Fuel and wash buildings

A bus wash building, approximately 4,500 square feet in size, would accommodate a fully enclosed, two-bay, drive-through bus wash operation.

A fueling facility would be provided, including an approximately 1,000-square-foot support systems building and an approximately 3,000-square-foot canopy over two fueling lanes. The support systems building would include lube tanks for fluids used at the fuel island, an air compressor to run the pumps and equipment at the fuel island, vacuum equipment used to clean the buses during servicing, computerized equipment for the fuel/fluid management systems, a custodial room, and staff restrooms. An area for aboveground fuel tanks would be sited to the north of the fueling facility building. The fuel tanks are proposed to be aboveground and double-walled for easier observation and maintenance purposes as well as for easier removal should the fleet be converted to an alternative fuel source in the future.

2.2 Utilities and site access

The site would be equipped with an oil/water separator that would be connected to all sanitary sewer elements serving vehicle maintenance areas and where otherwise required by the Washington State Department of Ecology's (Ecology's) *Stormwater Management Manual for Western Washington* (Ecology 2019) and the Alderwood Water & Wastewater District. This would include floor and trench drains in maintenance areas as well as the chassis wash areas. The bus washer system would be connected to a water reclaim system to reduce the water supply required for that function. Water and sanitary services would be tied to the Alderwood Water & Wastewater District services located along 20th Avenue SE.

Stormwater would be collected underground and detention would be provided in an on-site underground vault. Low-impact development practices, consistent with the Ecology's *Stormwater Management Manual for Western Washington* (Ecology 2019), would be accommodated as space and site conditions allow. Stormwater would ultimately tie into the City of Bothell system via the adjacent ditches.

Communications and natural gas services for the site would be tied into utilities currently available in 20th Avenue SE. Electrical service would be coordinated with the local electrical service provider—the Snohomish County Public Utility District—who would extend service to the site, most likely along the southern portion of the property. While the use of battery-electric buses is being considered for the future, it is not currently planned for the initial construction at this facility. To accommodate battery-electric buses on-site, it is anticipated that the area initially used to accommodate the aboveground fuel tanks (shown in **Figure 2-1**) would be removed and that area would be used for a small substation and battery area to provide the on-site power generation and storage needed to charge the bus batteries. It is anticipated that this area would be fenced for safety purposes.

Two site driveways/entrances would be provided from 20th Avenue SE to separate the bus and personal vehicle traffic. The primary fire department access would be through the bus entrance driveway. A secondary fire access would be provided through the employee parking entrance with an access point prior to the ramp up to the employee parking deck, as shown in **Figure 2-1**. To allow turns into and out of the facility from both driveways, the raised median that separates the northbound and southbound lanes of 20th Avenue SE would be modified, including providing a break in the median for the employee entrance and shortening the median on the south end to allow buses to exit the facility. Required sidewalks would be provided along the site street frontage.

2.3 Site work

Prior to construction, the site would be cleared and grubbed to remove existing vegetation not intended to be protected (i.e., outside of wetland areas that would not be filled and the stream buffer area shown on **Figure 2-1** as being fenced). The site would also be graded as needed to properly support the development and provide adequate drainage for the site.

Reinforced concrete paving would be used for all driveways and bus and large maintenance vehicle parking areas. Limited areas of asphalt paving could be provided in areas trafficked by personal vehicles. Depending upon existing soil conditions, paving may be installed over a treated subbase, such as lime or cement stabilized soil.

The site would be equipped with lighting as required to support the 24-hour-per-day operations and as needed for security. Landscaping would be provided in designated areas and in accordance with local ordinances. Vegetation would be low maintenance and provided with irrigation. The entire yard area would be secured by fencing with control gates at access and egress points. While fencing materials could vary around the site, all fencing would be affixed at the base via concrete. Gates and access points would be equipped with a key card system, provided with intrusion detection, and would also comply with the City of Bothell’s requirements for fire and life safety access. Closed-circuit television cameras are anticipated to be used on the site.

Landscaping would be provided on the perimeter of the site in designated areas and in accordance with local ordinances. Existing trees would be preserved around the perimeter of the site where possible, and vegetation/landscaping would be provided in accordance with Sound Transit’s design standards and would be low maintenance and provided with irrigation where needed.

2.3.1 Operations

The BBN facility would operate 24 hours per day, seven days per week. The facility would house general maintenance functions, including inspections; tire, brake, paint, and body work; parts distribution; and detail cleaning. Transit vehicle maintenance personnel would work in three shifts. Maintenance activities would be performed during all shifts. During the evening shift, personnel would primarily service vehicles through the fuel and wash cycle; however, during all shifts it is possible for any of the different maintenance activities to be performed.

Table 2-1 lists the typical times when buses and maintenance staff would arrive and depart the site for daily operations.

Table 2-1 Typical daily operations – arrivals and departures

Time of day	Daily operations – Arrivals and departures
4:00 a.m.	Transit operators and operations staff arrive
4:30 a.m.	Buses start to leave the facility at approximately 10-minute intervals
7:00 a.m.	Majority of buses off the site
8:00 a.m.	First shift for vehicle maintenance begins/third shift for vehicle maintenance ends
11:00 a.m.	Buses return to site during off-peak hours
2:00 p.m.	Transit operators and operations staff arrive
2:30 p.m.	Buses start to leave the facility at approximately 10-minute intervals
4:00 p.m.	Majority of buses off the site/second shift for vehicle maintenance begins
5:00 p.m.	First shift for vehicle maintenance ends
10:00 p.m.	Third shift for vehicle maintenance begins
12:00 a.m.	Second shift for vehicle maintenance ends

SOURCE: Sound Transit 2019

3 REGULATORY CONTEXT

Regulations that apply to all critical areas are described below. Wetlands and streams are regulated at the federal, state, and local levels. Agencies with jurisdiction include the U.S. Army Corps of Engineers (Corps), Ecology, and the City of Bothell. The Washington Department of Fish and Wildlife (WDFW) also regulates work within streams. Regulatory implications associated with development in wetlands include, but may not be limited to, those described in this section. In addition, state and local agencies issuing approvals require that analysis of project impacts under the Washington State Environmental Policy Act be completed prior to issuance of permits or approvals.

3.1 Federal

3.1.1 Wetlands and streams

U.S. Army Corps of Engineers Section 404 requirements

The Corps regulates discharges of dredged or fill materials into Waters of the United States, including wetlands and streams, under Section 404 of the Clean Water Act. The purpose of the Clean Water Act is to “*restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.*” A Section 404 permit may be required if a proposed project involves filling wetlands and/or streams. The Corps requires that wetland and stream impacts be avoided or minimized to the extent practicable; mitigation is typically required for unavoidable wetland and stream impacts. Wetlands considered “isolated” are nonjurisdictional under the Clean Water Act. The Corps makes the jurisdictional determination.

Because the proposed BBN project would include filling wetlands on-site (see Section 6), it is anticipated that the project would require coverage under a Section 404 Nationwide Permit (NWP); specifically, NWP 39 Commercial and Institutional Projects, appears appropriate.

3.2 State

3.2.1 Wetlands and streams

3.2.1.1 Ecology Section 401 water quality certification and the State Water Pollution Control Act

A Corps Section 404 permit application also requires state participation in resource protection under Section 401 of the federal Clean Water Act. Section 401 directs each state to certify that proposed in-water activities would not adversely affect water quality or violate state aquatic protection laws. In Washington state, permitting for activities in wetlands and streams is administered by Ecology. Ecology may issue approval, approval with conditions, denial, or request additional information. Conditions attached to the Section 401 certification become part of the Section 404 permit. Ecology regulates isolated wetlands and applies water quality standards under the state’s Water Pollution Control Act. Impacts to isolated wetlands require approval by Ecology.

3.2.1.2 WDFW Hydraulic Project Approval

WDFW is responsible for preserving, protecting, and perpetuating all state fish and shellfish resources. The Hydraulic Code (Chapter 77.55 Revised Code of Washington) requires that any person, organization, or government agency wishing to conduct a construction activity that will use, divert, obstruct, or change the bed or flow of state waters must do so under the terms of a Hydraulic Project Approval permit issued by WDFW. State waters include all marine and fresh waters of the state, except those watercourses that are entirely artificial, such as irrigation ditches, canals, and stormwater runoff devices.

3.3 Local

3.3.1 Wetlands

The Bothell Municipal Code (BMC) determines wetland buffer widths based on the wetland category and habitat score. Definitions of the various wetland categories per BMC 14.04.500.B(1) are presented below.

- Category I – Those wetlands that (i) represent a unique or rare wetland type; or (ii) are more sensitive to disturbance than most wetlands; or (iii) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or (iv) provide a high level of functions. These include bogs, mature and old-growth forested wetlands, and wetlands that perform many functions very well.
- Category II – Those wetlands that are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection. These wetlands perform most functions relatively well, or performed one group of functions very well and the other two moderately well.
- Category III – Those wetlands with a moderate level of functions that have generally been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.
- Category IV – Those wetlands that have the lowest levels of functions and are often heavily disturbed. These are wetlands that should be able to be replaced, and in some cases be able to be improved. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and also need to be protected.

Table 3-1 presents the standard wetland buffers as required by BMC 14.04.530.F. These required buffers use habitat points from the 2004 version of Ecology's *Washington State Wetland Rating System for Western Washington* (Ecology 2004). The rating system was revised in 2014 (Ecology 2014), and although the revised version is required per BMC 14.04.500.B, the BMC buffer recommendations have not been revised to reflect the new habitat scoring. However, Ecology provides guidance for converting habitat scores between the old and revised versions at <https://ecology.wa.gov/Water-Shorelines/Wetlands/Tools-resources/Rating-systems>.

Table 3-1 Wetland categories and buffer standards for City of Bothell

Wetland Category	Habitat Score	Standard Wetland Buffer Width
Category I	20 or greater	125 feet
	Less than 20	100 feet
Category II	20 or greater	125 feet
	Less than 20	100 feet
Category III	20 or greater	100 feet
	Less than 20	75 feet
Category IV	50 feet	

SOURCE: Ecology 2014

Per BMC 14.04.430.F(4) wetland buffers may undergo buffer averaging if all the following criteria are met:

- 1) *It will not reduce wetland functions or functional performance;*
- 2) *The wetland contains variations in sensitivity due to existing physical characteristics or the character of the buffer varies in slope, soils, or vegetation, and the wetland would benefit from a wider buffer in places and would not be adversely impacted by a narrower buffer in other places;*
- 3) *The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer; and*
- 4) *The buffer width is not reduced to less than 75 percent of the standard buffer width, and in any case to not less than 50 feet except that for Category IV wetlands, the buffer width may be reduced to 37.5 feet when extensive wetland and buffer enhancements are provided.*

3.3.2 Streams

Streams are regulated under Article XV of the BMC Chapter 14.04 – *Fish and Wildlife Habitat Areas*. The BMC critical areas regulations determine development standards and stream buffer widths based on the stream classification (BMC 14.04.930.D). BMC 14.04.005 defines a watercourse as “any portion of a channel, bed, bank, or bottom waterward of the ordinary high water line of waters of the state, including areas in which fish may spawn, reside, or through which they may pass, and tributary waters with defined beds or banks that influence the quality of fish habitat downstream.” This definition includes watercourses that flow on an intermittent basis, or that fluctuate in level during the year, and applies to the entire bed of such watercourse whether or not the water is at peak level. This definition does not include artificial watercourses such as irrigation ditches, canals, or stormwater runoff devices, except where they exist in a natural watercourse that has been altered by humans.

Within Bothell, watercourses are also classified as Type S, Type F, Type Np, or Type Ns according to the permanent water typing system (Washington Administrative Code [WAC] 222-16-030), as follows:

- Type S means all waters, within their banks, inventoried as “shorelines of the state,” including periodically inundated areas of their associated wetlands.
- Type F means segments of natural waters other than Type S waters that are within the banks of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at seasonal low water and which in any case contain fish habitat.
- Type Np means all segments of natural waters within the banks of defined channels that are perennial non-fish habitat streams. Perennial streams are flowing waters that do not go dry any time of a year of normal rainfall and include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow.
- Type Ns means all segments of natural waters within the banks of the defined channels that are not Type S, Type F, or Type Np waters. These are seasonal, non-fish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream reach that is a Type Np water.

Standard stream buffers as required by BMC 14.04.930 are presented in **Table 3-2**.

Table 3-2 Stream buffer standards for City of Bothell

Stream Type	Standard Stream Buffer Widths
Type S	100 feet ¹
Type F	100 feet
Type Np	75 feet
Type Ns	50 feet

SOURCE: BMC 14.04.930

NOTE:¹ Except the main stem of North Creek located between 240th Street SE and 228th Street SE, which has a designated stream buffer width of 150 feet.

Per BMC 14.04.920.G(3) stream buffer may be averaged if they meet the following criteria:

- 1) It will not reduce stream or habitat functions;
- 2) It will not adversely affect anadromous fish habitat;
- 3) It will provide additional natural resource protection, such as buffer enhancement;
- 4) The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer; and
- 5) The buffer area width is not reduced by more than 25 percent in any location.

3.3.2.1 Other critical areas

Fish and wildlife habitat areas

In addition to streams, other fish and wildlife habitat areas regulated under BMC 14.04, Article 15 include the following:

- Areas with which state or federally designated endangered, threatened, and sensitive species have a primary association
- State priority habitats and areas associated with state priority species
- Habitats and species of local importance
- Naturally occurring ponds under 20 acres
- Other “waters of the state” (lakes, rivers, ponds, inland waters, underground waters, and all other surface waters and watercourses within the jurisdiction of the state)
- Lakes, ponds, streams, and rivers planted with game fish by a government or tribal entity
- State natural area preserves and natural resource conservation areas

Critical aquifer recharge areas

BMC 14.04.005 defines critical aquifer recharge areas (CARAs) as areas designated by WAC 365-190-080(2) that are determined to have a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-080(2). Per BMC 14.04.600, the extent of regulation shall be based on the degree of vulnerability of an identified CARA and the potential of contaminant loading of the proposed development.

Frequently flooded areas

BMC 14.04.005 defines frequently flooded areas as lands in the floodplain subject to a 1 percent or greater chance of flooding in any given year. BMC 14.04.760 describes specific development regulations for proposals in frequently flooded areas. These include, but are not limited to, demonstrating that the proposed improvement would not increase the water surface elevation of the base flood more than 1 foot, use of specific construction materials and methods, building elevation requirements, and prohibiting the construction or reconstruction of structures in the floodway.

Geologically hazardous areas

BMC 14.04.800 designates geologically hazardous areas as those areas susceptible to one or more of the following types of hazards: erosion, landslide, seismic, and other geological events such as mass wasting, debris flow, rock falls, and differential settlement. Per BMC 14.04.840, only activities approved and permitted consistent with an approved critical areas report shall be allowed in erosion or landslide hazard areas. Construction of new buildings less than 2,500 square feet in size are allowed in seismic hazard zones per BMC 14.04.840. Performance standards for alterations in geologically hazardous areas are described in BMC 14.04.870. Alterations may only occur for development activities that:

1. *Will not increase the threat of the geological hazard to adjacent properties beyond pre-development conditions;*
2. *Will not adversely impact other critical areas;*
3. *Are designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than pre-development conditions; and*
4. *Are certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington.*

In addition to general critical area report requirements, additional technical requirements are required for specific hazards per BMC 14.04.860 and must be prepared by a licensed geotechnical engineer.

4 METHODOLOGY

A desktop review was conducted, which included reviewing existing literature, maps, and other materials to identify wetlands or site characteristics indicative of critical areas on the subject property. A list of materials reviewed is included in Section 4.2. These sources indicated the likelihood of the presence of critical areas, which was then confirmed from field investigations. In total, three site visits were conducted on April 8 and 9, and June 5, 2019.

4.1 Study area

The 500-foot study area for this analysis was selected by determining where construction and operation activities could affect critical areas through changes in noise, light, and human disturbance. Selection of the study area also considered anticipated project-related changes to the distribution and condition of critical areas, vegetation, and the availability of suitable wildlife habitat. The study area for the BBN project is identified in Section 5.1.

4.2 Data sources

Existing literature, maps, and other materials were reviewed to identify wetlands, streams, or site characteristics indicative of wetlands and streams in the project area. These sources indicated the likelihood of the presence of wetlands, which was then confirmed from field investigations conducted on April 8 and 9, and June 5, 2019. Key sources of information included the following:

- Natural Resources Conservation Service Web Soil Survey (2019)
- Wetland and stream mapping from the National Wetlands Inventory (USFWS 2019)
- Washington Natural Heritage Program Wetlands of High Conservation Value (Washington State Department of Natural Resources [WDNR] 2019)
- Priority Habitats and Species data (WDFW 2019a)
- SalmonScape fish database and mapping application (WDFW 2019b)

- Snohomish County Planning and Development Services Map Portal (2019)
- City of Bothell Map (2019)
- *Bus Rapid Transit I-405 Corridor Technical Memorandum: Ecosystems and Natural Resources for Alternatives Development and Evaluation* (Sound Transit 2018)
- *Bus Base North Wetland and Stream Delineation Report* (Appendix A)

Complete citations for these and other information sources are included in Section 8.

4.2.1 Jurisdictional delineation

4.2.1.1 Wetlands

To determine the presence and extent of wetlands in the study area, the methods defined in the *Western Mountains, Valleys, and Coast Regional Supplement* (Corps 2010) to the Corps' 1987 *Wetlands Delineation Manual* (Environmental Laboratory 1987) were used. Ecology repealed WAC 173-22-080 (the state wetland delineation manual) and replaced it with a revision of WAC 173-22-035 that states that delineations should be conducted according to the currently approved federal manual and supplements (effective March 14, 2011).

The methodology outlined in the manuals is based on three essential characteristics of wetlands: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Field indicators of these three characteristics must all be present to determine that an area is a wetland (unless problem areas or atypical situations are encountered).

The "routine on-site determination method" was used to determine the wetland boundaries. The routine method is used for areas equal to or less than 5 acres in size, or for larger areas with relatively homogeneous vegetative, soil, and hydrologic properties. Formal data plots were established where information regarding each of the three wetland parameters (vegetation, soils, and hydrology) were recorded. This information was used to distinguish wetlands from non-wetlands. Additional information, including delineation methods and wetland delineation data sheets are provided in the *Bus Base North Wetland and Stream Delineation Report* located in Appendix A.

The off-site field investigation was conducted at the reconnaissance level. Visual observations were made to estimate the boundaries of wetlands determined to be off-site; formal data plots in identified off-site wetlands were not established. For each wetland identified within 500 feet of the project area, the mapped boundary was used in this analysis.

4.2.1.2 Streams

The assessment of streams in the project area followed methods defined by the Corps and Ecology for the identification of streams and the ordinary high water mark (OHWM) (Corps 2014; Anderson et al. 2016). To determine a stream's lateral jurisdiction under the Clean Water Act, the Corps defines the OHWM as: "*that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the*

surrounding areas" (Corps 2014). Similarly, Ecology defines the OHWM as the *"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"* (Anderson et al. 2016).

Other physical characteristics that determine the OHWM include wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; bed and banks; water staining; and a change in plant community (Corps 2014). Streams were evaluated based on a qualitative analysis of the channel width, substrate, bed features, stream gradient, and fish access. The OHWM of the stream was flagged and GPS data was collected to document the stream boundary.

The off-site field investigation was conducted at the reconnaissance level and only visual observations were made to estimate the boundaries of streams determined to be off-site. For streams identified within 500 feet of the parcel, the mapped boundary was used in this analysis.

4.2.1.3 Other critical areas

A geographic information system (GIS) analysis was performed to evaluate the presence of other designated critical areas within the study area. Existing critical area mapping was overlaid with the proposed project areas to identify potential areas where impacts could occur. Mapping sources included Federal Emergency Management Agency 100-year floodplain maps, Snohomish County geologically hazardous area mapping, and WDFW Priority and Habitat Species mapping to determine the presence of ESA-listed wildlife.

4.3 Impacts assessment

Construction and operational impacts were analyzed by evaluating the potential for the project to change or alter critical areas.

4.3.1 Construction impacts

Construction impacts were analyzed by considering the following:

- The potential to disrupt the abundance, distribution, and conditions of ESA-listed species and critical habitat due to temporary construction light, noise, traffic, stormwater runoff, and other human-generated disturbance
- The likely extent of damage to vegetation, wetlands, and streams due to proposed grading, filling, and other construction activities
- The anticipated extent of construction work taking place in other types of critical areas found in the study area

4.3.2 Long-term impacts

Long-term impacts were analyzed by considering the following:

- Potential changes to the distribution or condition of wetlands and streams in the study area
- Potential changes in the abundance and distribution of ESA-listed species and critical habitat due to noise, light, and human disturbance over time
- Changes to the abundance of vegetation and wildlife habitat
- Permanent changes or effects to other type of critical areas found in the study area

5 EXISTING CONDITIONS

5.1 Selected study area

The BBN site is the approximately 12.5-acre parcel, Tax Parcel #27052900200800, in the City of Bothell, Snohomish County, Washington, as shown in **Figure 1-1**. The site is currently undeveloped and is a graded fill pad that has been regularly mowed and maintained. The parcel is located within the North Creek sub-watershed within Water Resource Inventory Area (WRIA) 8: Cedar – Sammamish. North Creek, a tributary to the Sammamish River, which is located east of the BBN site across 20th Avenue SE. The topography of the BBN site is relatively flat with a gradual 15-foot slope east to west toward North Creek.

The extent of the study area selected is a 500-foot area around the BBN parcel as it represents the area where noise levels would likely decrease to background noise levels.

5.2 Habitat description

Vegetation on the BBN parcel is primarily mowed grass with a few mature black cottonwood (*Populus trichocarpa*) trees along the southern border. A forested Native Growth Protection Area is located within the study area, adjacent to the southeast portion of the project parcel. Large brambles of Himalayan blackberry (*Rubus armeniacus*) are located along the northern and southern edges of the parcel. Other vegetation observed on-site includes reed canarygrass (*Phalaris arundinacea*), Tansy ragwort (*Senecio jacobaea*), and knotweed (*Polygonum sp.*). The study area is located in a highly developed, urban environment, and the BBN parcel is bordered by the Northshore School District's bus base to the north, an office building to the east, light-industrial buildings to the south, and 20th Avenue SE to the west. An approximately 35-acre forested wetland area is located to the northeast of the parcel and is separated from the BBN parcel by a berm that serves as a utility access road. A forested riparian corridor is located to the west of the BBN parcel, separated by 20th Avenue SE.

Wildlife species in the study area likely include birds (e.g., song sparrows, American robin, American crow) and small mammals (e.g., Virginia opossum, eastern cottontail, eastern gray squirrel) that are well adapted to living in a highly altered landscape and can tolerate or benefit from human disturbance. Few habitat features are present on the BBN parcel, and habitat is

limited to the northeast and southeast portions of the study area where there is forested cover. Within the BBN parcel, few habitat structures exist to provide refuge.

5.3 Wetlands

Two wetlands located entirely on-site were delineated during the April and June field investigations. Additionally, within the 500-foot study area, five wetlands were assessed off-site using Ecology’s *Washington State Wetland Rating System for Western Washington* (Hruby, 2014). Wetland characteristics and wetland buffers per BMC 14.04.530.F.1.a, and based on the wetland rating and habitat score are summarized in **Table 5-1** and presented in **Figure 5-1**.

Table 5-1 Wetland rating and applicable buffer distances

Wetland Name	Cowardin Class	HGM Classification	Size (acre)	Wetland Location	Wetland Category ¹	Habitat Score ¹	BMC Required Standard Buffer Width (feet)
WBO-1	PEM	Depressional	0.4	On-site	III	Less than 20	75
WBO-2	PEM	Depressional	0.4	On-site	III	Less than 20	75
WBO-3	PSS/PFO	Depressional	Unknown	Off-site	III	Less than 20	75
WBO-4	PEM/PSS/PFO	Depressional	Unknown	Off-site	II	Less than 20	100
WBO-5	PEM/PSS	Depressional	Unknown	Off-site	III	Less than 20	75
WBO-6	PEM/PSS	Depressional	Unknown	Off-site	III	Less than 20	75
WBO-7	PEM/PSS/PFO	Depressional	Unknown	Off-site	II	More than 20	105

SOURCE: BMC 14.04.530.F.1.a

NOTES: ¹2014 Wetland Rating System translated to the 2004 Wetland Rating System (Ecology 2018)

HGM = hydrogeomorphic; PEM = emergent, palustrine; PFO = forested, palustrine; PSS = scrub-shrub, palustrine

Additional information regarding wetlands in the study area is included in the *Bus Base North Wetland and Stream Delineation Report* located in Appendix A.

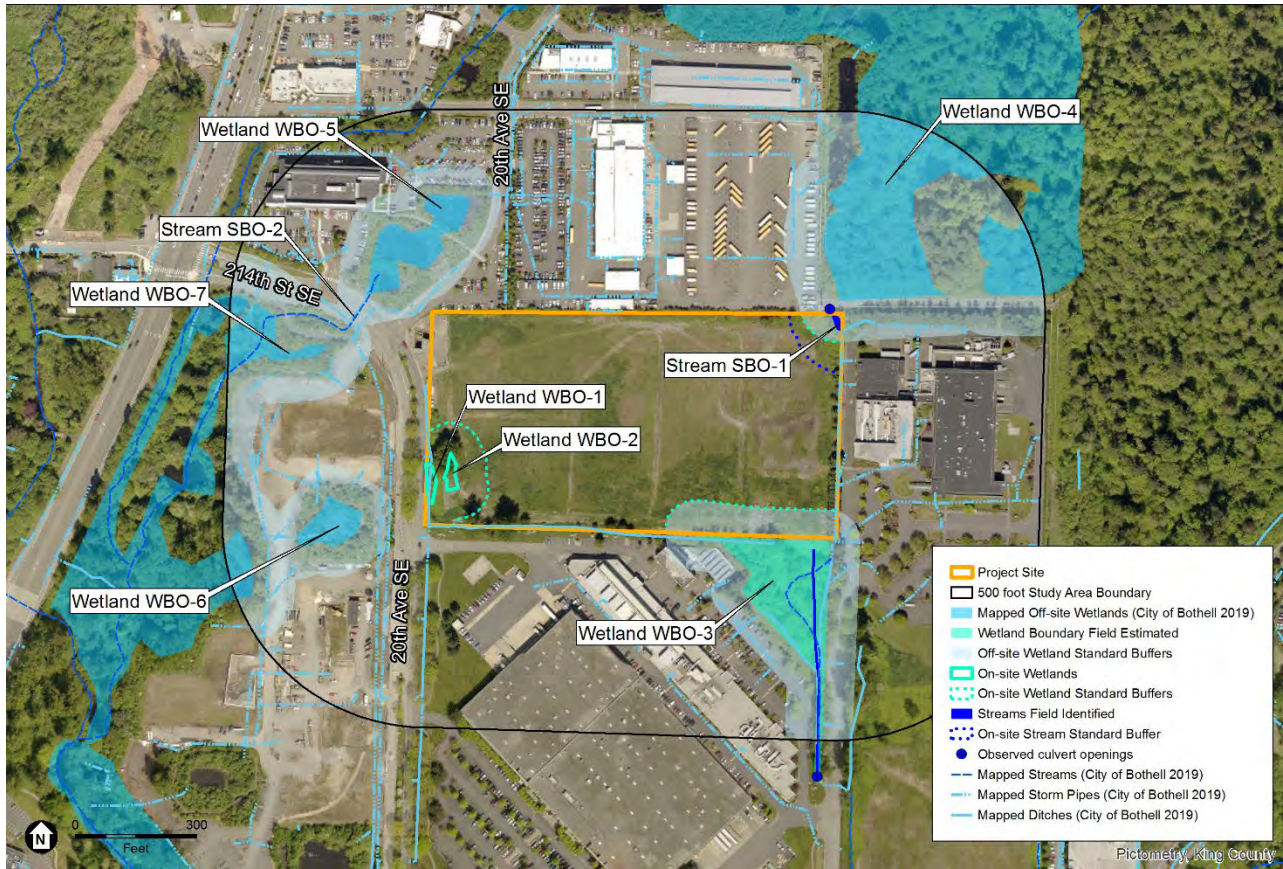


Figure 5-1 Wetlands and streams within the study area

5.4 Streams

Two streams occur within the 500-foot study area. Stream SBO-1 is located within the project area and is a fish-bearing (Type F) stream in the northeast corner of the BBN parcel (**Figure 5-1**). The stream originates off-site to the north and drains to the south. The stream flows through Wetland WBO-4 and enters the BBN parcel through a perched culvert under a utility corridor to the north. It then flows through the BBN parcel for approximately 55 feet before exiting through a culvert off-site and adjacent to the eastern boundary of the BBN parcel. Off-site, the stream is then piped along the entirety of the eastern boundary of the project area before flowing into Wetland WBO-3 south of the project area. The stream then flows through a series of pipes and ditches along 23rd Drive SE before joining a wetland complex north of North Creek and approximately 0.6-mile south of the BBN parcel.

Stream SBO-2 is located outside of the project parcel and is an unnamed tributary to North Creek. SBO-2 is located in the northwestern extent of the study area and flows southwest, approximately 450 feet west of the project parcel. The stream originates in Wetland WBO-5 and flows southwest under 214th Street SE. The stream continues west and southwest before joining North Creek approximately 0.2-mile from the road crossing. SBO-2 is a fish-bearing (Type F) stream with intermittent flow with no documented use by salmonids (WDFW 2019b).

Per BMC 14.04.930.D.2, Type F streams are allotted a 100-foot buffer.

No other streams were observed as occurring within the study area during the April and June 2019 site visits. The ditch mapped adjacent to the project area along the east side of 20th Avenue SE was not observed during the site visits. It is unclear if the ditch has been filled during recent road improvements or if this is an error in mapping.

Additional information regarding streams in the study area is included in the *Bus Base North Wetland and Stream Delineation Report*, located in Appendix A.

5.5 Other critical areas

According to the WDFW Priority Habitat Species data, no federal or state listed animals occur within the study area. The closest known occurrence is North Creek, approximately 0.2-mile to the west. Listed species within North Creek include federally listed Chinook salmon and steelhead trout, as well as state-protected cutthroat trout, coho salmon, and sockeye salmon. Additionally, according to the WDNR Natural Heritage Program mapping, no federally or state listed plant species occur within the study area.

No additional fish and wildlife habitat areas, as defined by BMC 14.04 and listed above in Section 3.3.2.1, were observed as occurring within the study area.

No CARAs or frequently flooded areas are mapped as occurring within the study area. The closest mapped floodplain is along North Creek, outside of the study area to the west.

Two small steep slope areas are mapped by Snohomish County as occurring within the study area (**Figure 5-2**). One is located along the utility access road berm to the east of the project parcel. The other occurs within the southeast extents of the study area and is located within a mowed, undeveloped field. These features were not confirmed in the field due to a lack of permission to access. No other geological hazards are mapped as occurring within the study area.



Figure 5-2 Mapped steep slopes within the study area

6 ENVIRONMENTAL IMPACTS

6.1 Construction impacts

Other than the permanent wetland fill described in Section 6.2.1, impacts to wetlands and streams and their associated buffers as a result of construction of the project are expected to be negligible. Minor and temporary soil erosion could occur as a result of clearing and grading during project construction, primarily during precipitation events. However, the potential for erosion would be minimized with adherence to best management practices (BMPs) approved by Ecology and the City of Bothell. BMPs would also minimize the potential for sediment and waste materials to enter streams and wetlands during construction. The following measures and BMPs would be incorporated during construction to minimize the potential for erosion:

- Restrict construction of the proposed project, including all staging areas, to the BBN parcel.
- Transport all debris and spoil material off-site to an appropriate disposal facility.

- Prepare a Stormwater Pollution Prevention Plan (SWPPP) and a Temporary Erosion and Sediment Control Plan to prevent sediment transport from the project site. Erosion control measures could include the use of silt fencing, catch basin inlet protection, a stabilized construction entrance, and other measures as specified in the Stormwater Pollution Prevention Plan. Other erosion control measures would be incorporated, as necessary, in accordance with City of Bothell and Ecology requirements.
- Refuel construction equipment more than 100 feet from surface waters.
- Locate equipment and material staging in areas to prevent the contamination of any wetland or water body, consistent with project permits.
- Use nontoxic hydraulic fluids on all equipment being used within on-site wetlands.

Additionally, no impacts to off-site wetlands and stream area are anticipated to occur as a result of construction of the project. Furthermore, no other critical areas occur within the construction area and, therefore, no additional impacts are anticipated as a result of construction.

6.2 Long-term impacts

6.2.1 Wetlands

Because the project is a design-build project, exact areas of wetland fill have not been determined. However, it is likely that the majority of the wetlands will need to be filled to accommodate the bus entrance/exit and the employee and visitor parking entrance. Therefore, this analysis assumes that the entire area of Wetland WBO-1 (1,656 square feet or 0.04 acre) and the entire area of Wetland WBO-2 (1,699 square feet or 0.04 acre) would be filled, for a project total of 0.08 acre of wetland fill. It is likely that the project would be permitted under a NWP 39 for commercial and institutional projects. The maximum fill allowance under the NWP is 0.5 acre, which would not be met even if the entirety of both Wetland WBO-1 and WBO-2 were filled. Federal, state, and local approvals would be obtained for all critical area impacts, and impacts would be mitigated consistent with the corresponding standards.

A total of 35,807 square feet (0.82 acre) of wetland buffer impact would occur as a result of the Project. To construct the bus entrance and exit, as well as the employee and visitor parking in the southwest portion of the parcel, 18,042 square feet (0.41 acre) of buffer impacts to Wetlands WBO-1 and WBO-2 would occur as a result of paving. An additional 17,765 square feet (0.41 acre) of buffer for Wetland WBO-3 would be paved and used as part of the bus parking and travel route in the southeast portion of the project parcel. Impacts to wetlands and wetland buffers are summarized in **Table 6-1**.

Table 6-1 Wetland and wetland buffer impacts

Wetland ID	Wetland impact (square feet)	Buffer impact
WBO-1	1,655	18,042
WBO-2	1,699	Included in calculation for WBO-1
WBO-3	0	17,765
Total	3,354	35,807

SOURCE: Sound Transit 2020

Outside of the BBN parcel, no impacts to other wetlands within the study area are anticipated to occur as a result of the project. Given the nature of mitigation that would be required and provided per BMC 14.04.540, and as described in Section 7, no probable substantial adverse impacts to wetlands are expected to occur.

6.2.2 Streams

No impacts to streams or stream buffers within the study area, on-site or off-site, are anticipated to occur as a result of the project.

6.2.3 Other critical areas

The only other critical area mapped as occurring within the study area is the small steep slope area along the utility access road berm, outside of the BBN parcel. Construction and operation of the project would only occur on the BBN parcel and, therefore, no impacts to this steep slope area would occur.

7 MITIGATION MEASURES

7.1 Construction impacts

As a result of the applied BMPs described in Section 6.1, impacts to wetlands, streams, and other critical areas during construction are not anticipated.

7.2 Long-term impacts

Unavoidable permanent impacts on wetlands and associated buffers would be subject to the mitigation requirements described in BMC 14.04.540. The City of Bothell’s mitigation standards would include one or more of the following actions, in order of preference:

1. Permittee responsible mitigation, including:
 - a. Restoration (reestablishment or rehabilitation);
 - b. Establishment (creation);

- c. Enhancement of degraded wetlands (in combination with restoration and/or establishment).
- 2. Purchasing credits from an approved Mitigation Bank in WRIA 8 if available and feasible and approved by the city;
- 3. Purchasing credits from an approved In-Lieu Fee program if available and feasible and approved by the city.

Table 7-1 includes the wetland and wetland buffer mitigation ratios for Category III wetlands, as found in the project area and off-site. The BMC does not specifically require a mitigation ratio specific to wetland and stream buffers; however, buffer mitigation is typically proposed at a 1:1 ratio.

Table 7-1 Wetland mitigation ratios

Wetland Category and Type of Impacted Wetland and Associated Buffer	Restoration or Creation	Enhancement Only
Category III	2:1	3:1 to 6:1

SOURCE: BMC 14.04.540.F, BMC 14.04.540.G

Post-construction, the BBN parcel would be largely developed. If the required mitigation cannot be performed on-site, Sound Transit may opt to purchase credits from an approved mitigation bank within WRIA 8, such as the Keller Farm Mitigation Bank. Mitigation banking generally is the mitigation approach preferred by the Corps, followed by in-lieu fee programs, followed by permittee-responsible mitigation.

A mitigation strategy would be chosen that would be acceptable to both the Corps and the City of Bothell. Given the quality of wetlands that would be impacted, mitigation for their loss, whether on-site or off, would contribute to an overall improvement in ecological function within the watershed. Because permittee-responsible mitigation is the mitigation strategy favored by the city, Sound Transit is currently assessing possible mitigation sites within the same subbasin in City of Bothell limits. Sound Transit will continue to coordinate with the city on a preferred mitigation strategy before submitting permitting applications.

8 REFERENCES

- Anderson, P., S. Meyer, P. Olson, and E. Stockdale. 2016. *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. Shorelands and Environmental Assistance Program, Washington State Department of Ecology. Olympia, Washington.
- Bothell, City of. 2019. City of Bothell mapping application. Internet website: <https://gismaps.bothellwa.gov/H5/index.html?viewer=COBMap>. Accessed June 2019.
- Brinson, M. 1993. *A Hydrogeomorphic Classification for Wetlands*. U.S. Army Corps of Engineers, Wetlands Research Program. 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*. FWS/OBS-79/31. U.S. Fish and Wildlife Service.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Google Earth Pro V 7.3.2.5776. 2019. Bothell, Washington, United States of America.
- Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington: 2014 Update*. Publication #14-06-029. Olympia, WA: Washington State Department of Ecology.
- Natural Resources Conservation Service. 2019. Web Soil Survey. Internet website: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed June 2019.
- Snohomish County. 2019. Planning and Development Services Map Portal. Internet website: <http://gismaps.snoco.org/Html5Viewer/Index.html?viewer=pdsmappointal>. Accessed April 2019.
- Sound Transit. 2016. *Sound Transit 3 (ST3) System Plan*.
- Sound Transit. 2018. *Bus Rapid Transit I-405 Corridor Technical Memorandum: Ecosystems and Natural Resources for Alternatives Development and Evaluation*. September.
- U.S. Army Corps of Engineers (Corps). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*. Version 2. Wetlands Regulatory Assistance Program. May 2010. ERDC/EL TR-10-3. Internet website: http://www.usace.army.mil/CECW/Documents/cecwo/reg/west_mt_finalsupp.pdf.
- U.S. Army Corps of Engineers (Corps). 2014. *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States*. Wetlands Regulatory Assistance Program (WRAP). Hanover, New Hampshire.
- U.S. Fish and Wildlife Service (USFWS). 2019. National Wetlands Inventory Wetland Mapper. Internet website: <http://www.fws.gov/wetlands/Data/Mapper.html>. Accessed June 2019.
- Washington State Department of Ecology (Ecology). 2004. *Washington State Wetland Rating System for Western Washington*.

Washington State Department of Ecology (Ecology). 2014. *Washington State Wetland Rating System for Western Washington*. Revised.

Washington State Department of Ecology (Ecology). 2018. Tables for translating category scores and function scores. Internet website: <https://ecology.wa.gov/Water-Shorelines/Wetlands/Tools-resources/Rating-systems>. Accessed June 2019.

Washington State Department of Ecology (Ecology). 2019. *Stormwater Management Manual for Western Washington*. Prepared by Washington State Department of Ecology Water Quality Program. Publication Number 19-10-021. July 2019.

Washington State Department of Fish and Wildlife (WDFW). 2019a. Priority Habitats and Species data. Olympia, Washington. Internet website: <http://apps.wdfw.wa.gov/phsontheweb/>. Accessed June 2019.

Washington State Department of Fish and Wildlife (WDFW). 2019b. SalmonScape fish database and mapping application. Olympia, Washington. Internet website: <https://apps.wdfw.wa.gov/salmonscape/map.html>. Accessed June 2019.

Washington State Department of Natural Resources (WDNR). 2019. Natural Heritage Program Wetlands of High Conservation Value. Internet website: <http://wadnr.maps.arcgis.com/apps/webappviewer/index.html?id=5cf9e5b22f584ad7a4e2aebc63c47bda>. Accessed June 2019.

Washington State Department of Transportation (WSDOT). 2019. *Environmental Manual*. June 2019.

Appendix A

Bus Base North Wetland and Stream Delineation Report



Bus Base North

Bus Base North Wetland and Stream Delineation Report

October 2019

Revision History

Version	Title	Date	Notes, As Required
0	Bus Base North Wetland and Stream Delineation Report – Draft	June 19, 2019	Initial issue for review
1	Bus Base North Wetland and Stream Delineation Report – Draft	July 15, 2019	For Sound Transit review
2	Bus Base North Wetland and Stream Delineation Report	August 22, 2019	Issued as Final
3	Bus Base North Wetland and Stream Delineation Report	September 18, 2019	Final to be appended to Ecosystems Resources and Wetland Delineation Technical Memo

Summary

Purpose

This wetland and stream delineation report was prepared in support of the proposed Bus Base North project. The approximately 12.5-acre project area consists of the property at 21516 23rd Drive SE (Tax Parcel #27052900200800) in the City of Bothell, Snohomish County, Washington. The work was limited to the identification, delineation, and rating of wetlands and streams within the project area and identification and rating of potential wetlands within 300 feet of the project area.

Regulatory context

Wetlands and streams are regulated at the federal, state, and local levels. Under Section 404 of the Clean Water Act, the U.S. Army Corps of Engineers (Corps) regulates discharges of dredged or fill materials into waters of the United States, including wetlands. The Washington State Department of Ecology (Ecology) state certification process under Section 401 of the federal Clean Water Act is usually triggered through a Section 404 permit application. The City of Bothell (City) regulates critical areas and associated buffers through Bothell Municipal Code (BMC) Chapter 14.04 – Critical Area Regulations.

Methods

To delineate and assess wetlands and streams in the project area, existing information was reviewed and on-site investigations were conducted. To determine the presence and extent of wetlands in the project area, this study used methods defined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps 2010) to the Corps' 1987 *Wetlands Delineation Manual* (Environmental Laboratory 1987). Two classification systems that are commonly used to describe wetlands were used to assess wetlands in the project area: the hydrogeomorphic system and the U.S. Fish and Wildlife Service classification system (Cowardin et al. 1979). Wetland functions were assessed using Ecology's *Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014) and the Washington State Department of Transportation's *Wetland Functions Characterization Tool for Linear Projects* (Null et al. 2000). The assessment of streams in the project area followed methods defined by the Corps and Ecology for the identification of streams and the ordinary high water mark (Corps 2014; Anderson et al. 2016).

Results

Within the project area boundaries, two wetlands (WBO-1 and WBO-2) and one stream (SBO-1) were identified and delineated. In addition, five off-site wetlands (WBO-3 through WBO-7) and one stream (SBO-2) were identified within 300 feet of the project area.

On-site, Wetland WBO-1 is a depressionnal, palustrine emergent (PEM) and scrub-shrub (PSS) wetland in the southwest portion of the project area adjacent to 20th Avenue SE. Wetland WBO-2 is a depressionnal, PEM wetland in the southwest portion of the project area approximately 25 feet east of Wetland WBO-1. Stream SBO-1 is located in the northeast corner of the project area. Stream SBO-1 contains fish habitat and is therefore regulated as a Type F (fish-bearing) stream.

Off-site, Wetland WBO-3 is immediately adjacent to the southeastern corner of the site. Wetland WBO-3 is protected by the City as a Native Growth Protection Area (NGPA). Per BMC 14.04.005, NGPAs are designated areas of native vegetation that are preserved by the City for the purpose of preventing harm to property of critical areas. The wetland is a depressional, PSS and palustrine forested (PFO) wetland.

Wetland WBO-4 is located near the northeastern corner of the site behind a large berm that is used as an access road for a utility line. Wetland WBO-4 is a depressional wetland with palustrine aquatic bed (PAB), PEM, PSS, and PFO cover. Wetlands WBO-5 through WBO-7 are located east of the site on the west side of 20th Avenue SE. Wetlands WBO-5 and WBO-6 are depressional wetlands that contain PEM and PSS classes, and are likely used as stormwater ponds. Wetland WBO-7 is a large depressional wetland with PEM, PSS, and PFO classes. This wetland also likely has some riverine wetland characteristics as it is associated with North Creek.

Stream SBO-2 is a Type F tributary to North Creek and is located northwest of the project parcel.

Table of Contents

1	INTRODUCTION.....	1
1.1	Project overview	1
1.2	Purpose of report.....	2
1.3	Site description.....	2
2	METHODS	4
2.1	Review of existing information.....	4
2.2	Methods for on-site investigation.....	4
2.2.1	Determining the presence of wetlands and delineating wetland boundaries.....	4
2.2.2	Assessing wetland function and classification	5
2.2.3	Determining the presence of streams.....	5
2.2.4	Stream typing.....	6
2.3	Methods for off-site investigation.....	6
2.3.1	Estimating wetland boundaries.....	6
2.3.2	Assessing wetland functions and classification	6
3	RESULTS	7
3.1	Review of existing information.....	7
3.1.1	Soils.....	7
3.1.2	Wetlands.....	7
3.1.3	Streams	7
3.2	Results of field investigation.....	10
3.2.1	On-site wetlands.....	10
3.2.2	On-site streams	13
3.2.3	Off-site wetlands.....	13
3.2.4	Off-site Streams.....	18
4	REGULATORY CONTEXT	19
4.1	Federal regulatory requirements	19
4.2	State regulatory requirements	19
4.3	Local regulatory requirements.....	19
4.3.1	Wetland regulatory requirements.....	20
4.3.2	Stream regulatory requirements	22
5	LIMITATIONS	23

6 SUMMARY.....23

7 REFERENCES.....24

Figures

Figure 1-1 Bus Base North Project 1

Figure 1-2 Bus Base North project area and vicinity..... 3

Figure 3-1 Mapped soils in project area 8

Figure 3-2 Mapped wetlands and streams in project area and vicinity 9

Figure 3-3 Results of on-site wetland and stream investigation and associated buffers 11

Figure 3-4 Results of off-site wetland and stream investigation and associated buffers 15

Tables

Table 3-1 Wetland characteristics 10

Table 4-1 Wetland rating and applicable buffer distances..... 20

Table 4-2 Wetland and buffer mitigation ratios 22

Table 4-3 Stream buffers 22

Appendices

- Appendix A On-site Investigation Photos
- Appendix B Wetland Determination Methods
- Appendix C Wetland Determination Data Sheets
- Appendix D Wetland Rating System Forms and Figures
- Appendix E Wetland Functional Assessment Forms
- Appendix F Washington WETS Table

Acronyms and Abbreviations

BMC	Bothell Municipal Code
BRT	bus rapid transit
City	City of Bothell
Corps	U.S. Army Corps of Engineers
DP	data plot
Ecology	Washington State Department of Ecology
Interstate 405	I-405
NGPA	Native Growth Protection Area
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PDS	Snohomish County Planning and Development Services
PAB	palustrine aquatic bed
PEM	palustrine emergent
PFO	palustrine forested
PSS	palustrine scrub-shrub
SR	State Route
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1 INTRODUCTION

1.1 Project overview

As was identified in the *Sound Transit 3 (ST3) System Plan* (Sound Transit 2016), Sound Transit is planning for a new bus operations and maintenance facility (Bus Base North) located near the Interstate 405 (I-405)/State Route (SR) 522 corridors to service vehicles across Sound Transit's bus service lines (i.e., bus rapid transit (BRT) and ST Express bus). The site selected for development of the Bus Base North project is in the Canyon Park area of Bothell along 20th Avenue SE, as shown in **Figure 1-1** (Bus Base North project).

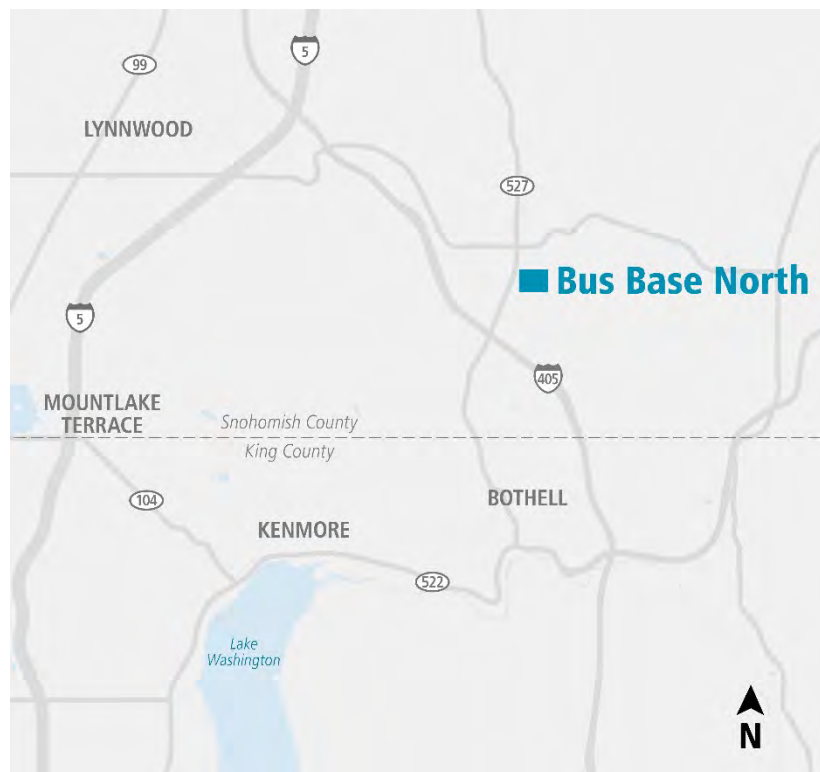


Figure 1-1 Bus Base North Project

The Bus Base North project would provide support for up to 80 articulated and 40 double-decker hybrid diesel buses. At the Bus Base North site, the buses would be stored, maintained, fueled, and washed, and the site would house the offices for operations staff and support areas for drivers and operations staff. Several structures are proposed on-site, including the following:

- A maintenance and operations building
- An elevated parking deck for all employees and visitors to the site (this parking deck would also provide cover for the bus parking area)

- A security guard house at the bus entrance gate to ensure that all vehicles entering the bus traffic areas have authorization to enter
- A fuel support systems building with canopy-covered fueling lanes

The planned timeline for the Bus Base North project includes completion of preliminary design during the summer of 2019, which will inform Sound Transit's subsequent process for selection of a design/build contractor. Completion of Bus Base North would occur prior to the initiation of BRT service in 2024 to allow for acceptance of the BRT bus fleet.

1.2 Purpose of report

This wetland and stream delineation report was prepared in support of the proposed Bus Base North project. The work was limited to the identification, delineation, and rating of wetlands and streams within the project area and identification and rating of potential wetlands within 300 feet of the project area.

1.3 Site description

The approximately 12.5-acre project area consists of the property at 21516 23rd Drive SE (Tax Parcel #27052900200800) in the City of Bothell, Snohomish County, Washington, as shown in **Figure 1-2**. The undeveloped project area is a graded fill pad that has been regularly mowed and maintained.

The project area is located in north Bothell within the Canyon Park Regional Growth Center Subarea (City of Bothell 2019). It is zoned as Residential-Activity Center (R-AC), Office-Professional (OP), Light Industrial (LI) and is surrounded by the Northshore School District bus base to the north, an office building to the east, light-industrial buildings to the south, and paved undeveloped land to the west (City of Bothell 2019).

The parcel is located within the North Creek sub-watershed within Water Resource Inventory Area (WRIA) 8: Cedar – Sammamish. North Creek, a tributary to the Sammamish River, is located east of the project area across 20th Avenue SE (**Figure 1-2**). The overall topography of the area slopes east to west toward North Creek. The topography of the previously graded project area is relatively flat with a gradual 15-foot increase in slope from the southwest corner to the northeast corner.

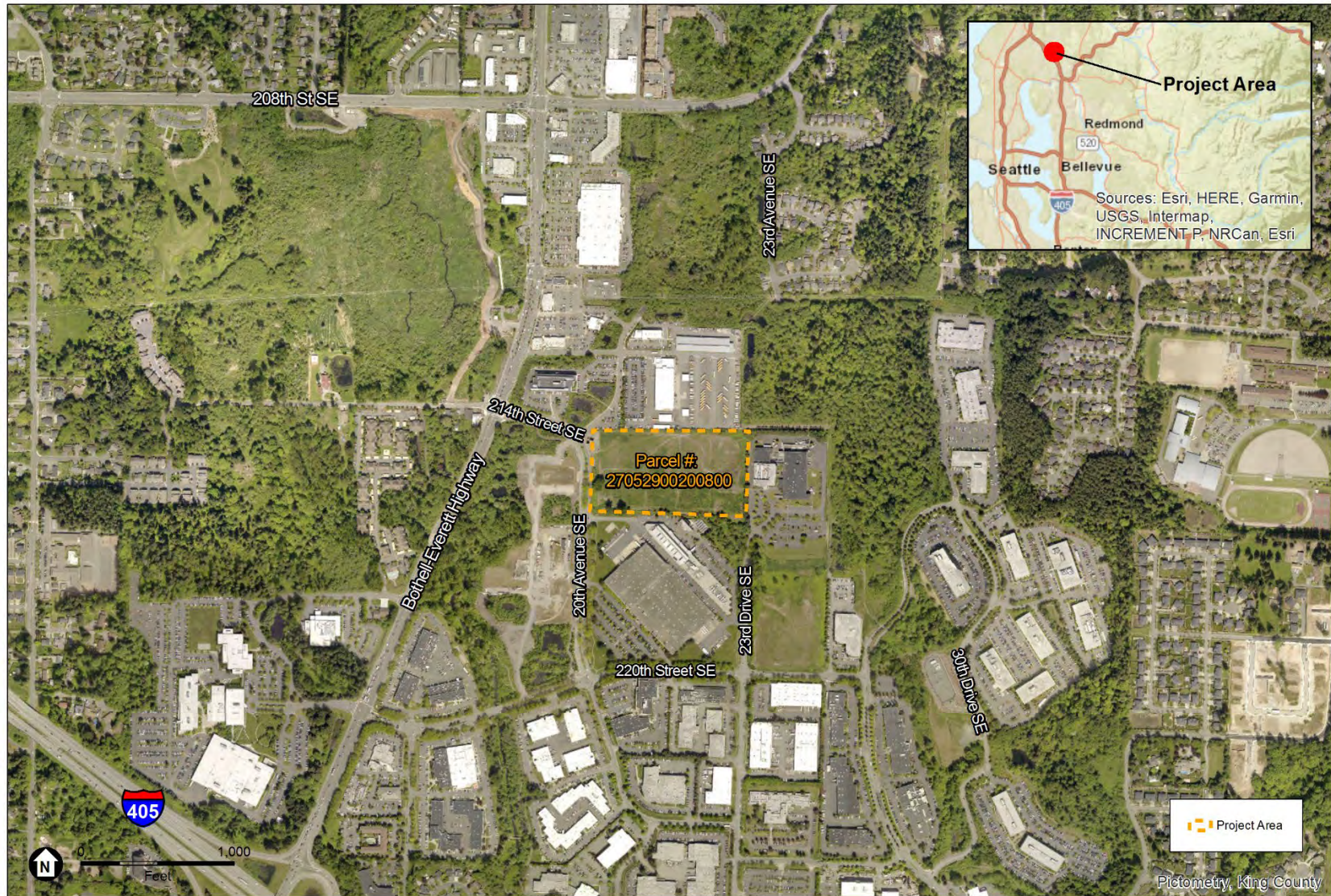


Figure 1-2 Bus Base North project area and vicinity

2 METHODS

Existing information was reviewed and on-site investigations were conducted to delineate and assess wetlands and streams in the project area.

2.1 Review of existing information

Existing literature, maps, and other materials were reviewed to identify wetlands, streams, or site characteristics indicative of wetlands and streams in the project area. These sources only indicate the likelihood of the presence of wetlands; actual wetland determinations must be based on data obtained from field investigations. Key sources of information included the following:

- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2019a)
- Wetland and stream mapping from the National Wetlands Inventory (NWI) (U.S. Fish and Wildlife Service [USFWS] 2019)
- Washington Natural Heritage Program Wetlands of High Conservation Value (Washington State Department of Natural Resources [WDNR] 2019)
- Priority Habitats and Species data (Washington Department of Fish and Wildlife [WDFW] 2019a)
- SalmonScape fish database and mapping application (WDFW 2019b)
- Snohomish County Planning and Development Services (PDS) Map Portal (2019)
- City of Bothell Map (2019)

Complete citations for these and other information sources are included in Section 7, References, of this report.

2.2 Methods for on-site investigation

2.2.1 Determining the presence of wetlands and delineating wetland boundaries

The characteristics of an area that result in its classification as “wetland” have been formally defined by federal and state agencies, as described in Appendix B. Numerous federal, state, and local regulations govern development and other activities in or near wetlands; at each level, several agencies are typically charged with such authority. Federal, state, and city regulations are summarized in Section 4 of this report.

To determine the presence and extent of wetlands in the project area, this study used methods defined in the *Western Mountains, Valleys, and Coast Regional Supplement* (U.S. Army Corps of Engineers (Corps) 2010) to the Corps; 1987 *Wetlands Delineation Manual* (Environmental Laboratory 1987). The Washington State Department of Ecology (Ecology) repealed Washington Administrative Code (WAC) 173-22-080 (the state wetland delineation manual) and

replaced it with a revision of WAC 173-22-035 that states that delineations should be done according to the currently approved federal manual and supplements (effective March 14, 2011).

The methodology outlined in the manuals is based on three essential characteristics of wetlands: (1) hydrophytic vegetation, (2) hydric soils, and (3) wetland hydrology. Field indicators of these three characteristics must all be present to determine that an area is a wetland (unless problem areas or atypical situations are encountered).

The “routine on-site determination method” was used to determine the wetland boundaries. The routine method is used for areas equal to or less than 5 acres in size, or for larger areas with relatively homogeneous vegetative, soil, and hydrologic properties. Formal data plots were established where information regarding each of the three wetland parameters (vegetation, soils, and hydrology) were recorded. This information was used to distinguish wetlands from non-wetlands. Additional information on delineation methods are provided in Appendix B. Wetland Delineation Data Sheets are provided in Appendix C.

2.2.2 Assessing wetland function and classification

Two classification systems were used to describe wetlands:

- The hydrogeomorphic system that describes wetlands in terms of their position in the landscape and the movement of water in the wetland (Brinson 1993).
- The USFWS classification system (Cowardin et al. 1979) that describes wetlands in terms of their vegetation communities.

For this project, wetland functions were assessed using Ecology’s *Wetland Rating System for Western Washington: 2014 Update* (Hruby 2014) and the Washington State Department of Transportation (WSDOT) *Wetland Functions Characterization Tool for Linear Projects* (Null et al. 2000). Although the Ecology rating system and WSDOT characterization tool are designed to assess wetlands, an assessment of wetland functions is inherent in the systems because they are based on whether a wetland performs a particular function and the relative level to which the function is performed. These systems were developed to differentiate wetlands based on their sensitivity to disturbance, their significance, their rarity, the ability to replace them, and the beneficial functions they provide to society. Appendix B provides additional information about wetland categories in the Ecology rating system. Appendix D provides completed Ecology rating forms for the project. Appendix E provides additional information about the WSDOT characterization system and WSDOT wetland functions field data forms for the project.

2.2.3 Determining the presence of streams

The assessment of streams in the project area followed methods defined by the Corps and Ecology for the identification of streams and the ordinary high water mark (OHWM) (Corps 2014; Anderson et al. 2016). To determine a stream’s lateral jurisdiction under the Clean Water Act, the Corps defines the OHWM as: “*that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the*

surrounding areas" (Corps 2014). Similarly, Ecology defines the OHWM as the "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," (Anderson et al. 2016).

Other physical characteristics that determine the OHWM include wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; bed and banks; water staining; and a change in plant community (Corps 2014). Streams were evaluated based on a qualitative analysis of the channel width, substrate, bed features, stream gradient, and fish access. The OHWM of the stream was flagged and GPS data was collected to document the stream boundary.

2.2.4 Stream typing

Streams were classified based on the WDNR Forest Practices Board water typing system (WAC 222-16-030) and Bothell Municipal Code (BMC) 14.04.005. The stream typing system applies to surface waters that produce a defined channel or bed and distinguishes them in general according to their status as a "shoreline of the state" (Type S), containing fish habitat (Type F), perennial non-fish habitat streams (Type Np), or seasonal non-fish habitat streams (Type Ns).

2.3 Methods for off-site investigation

Per BMC 14.04.520, the critical areas analysis must also address all wetlands within 300 feet of the project area. Below are the methods for the investigation for these off-site wetlands.

2.3.1 Estimating wetland boundaries

The off-site field investigation was conducted at the reconnaissance level. Visual observations were made to estimate the boundaries of wetlands determined to be off-site; formal data plots in identified off-site wetlands were not established. For each wetland identified within 300 feet of the project area, GPS data was collected to document the estimated outer wetland boundary.

2.3.2 Assessing wetland functions and classification

All wetlands within 300 feet of the project area were preliminarily rated using the methods defined in Section 2.2.2.

3 RESULTS

3.1 Review of existing information

Below are the results of the review of existing literature, maps, and other materials.

3.1.1 Soils

NRCS maps two soil types within the project area: Mukilteo muck and Everett very gravelly sandy loam, 0 to 8 percent slopes (NRCS 2019a). Mukilteo muck comprises most of the project area, while the northern portion of the project area is mapped as Everett very gravelly sandy loam (**Figure 3-1**). Mukilteo muck is classified as very poorly drained and formed from herbaceous organic material in depressions. Everett very gravelly sandy loam, 0 to 8 percent slopes is classified as somewhat excessively drained farmland of statewide importance formed from glacial outwash. The NRCS indicates that the only soil type in the project area considered to be hydric is Mukilteo muck (NRCS 2019a).

3.1.2 Wetlands

3.1.2.1 On-site wetlands

The city has mapped a small pond in the southwest corner of the project area (City of Bothell 2019). The Snohomish County PDS Map Portal shows three wetlands in the project area (**Figure 3-2**). One large wetland is mapped in the western portion of the project area by a remote sensing-based wetland model (Snohomish County 2019). Two wetlands are mapped in the south portion of the project area, with one of the wetlands extending off-site to the south by the Snohomish County wetland inventory (Snohomish County 2019). The USFWS NWI maps do not show wetlands occurring within the project area (USFWS 2019) (**Figure 3-2**).

3.1.2.2 Off-site wetlands

The City of Bothell (City) has also mapped wetlands that surround the project area; however, all but one of the wetlands are disconnected from the project area by roads (**Figure 3-2**). The one wetland mapped as connected to the project area is designated as a Native Growth Protection Area (NGPA) located south of the southeast portion of the project area.

The City, Snohomish County, and the USFWS NWI have mapped wetlands within a parcel just northeast of the project area (**Figure 3-2**). The wetlands within that parcel are disconnected from the project area by a utility corridor.

3.1.3 Streams

No streams are mapped within the project area (**Figure 3-2**). The City has mapped a stream south of the southeast corner of the project area (City of Bothell 2019). Snohomish County has mapped a stream flowing adjacent to the northern boundary of the project area (Snohomish County 2019). Both the City and Snohomish County map a stream offsite to the northwest, which flows southwest to join North Creek. Based on a review of the WDFW Priority Habitats and Species map, no priority habitats or species are known to occur on-site or within the vicinity (WDFW 2019a).



Figure 3-1 Mapped soils in project area

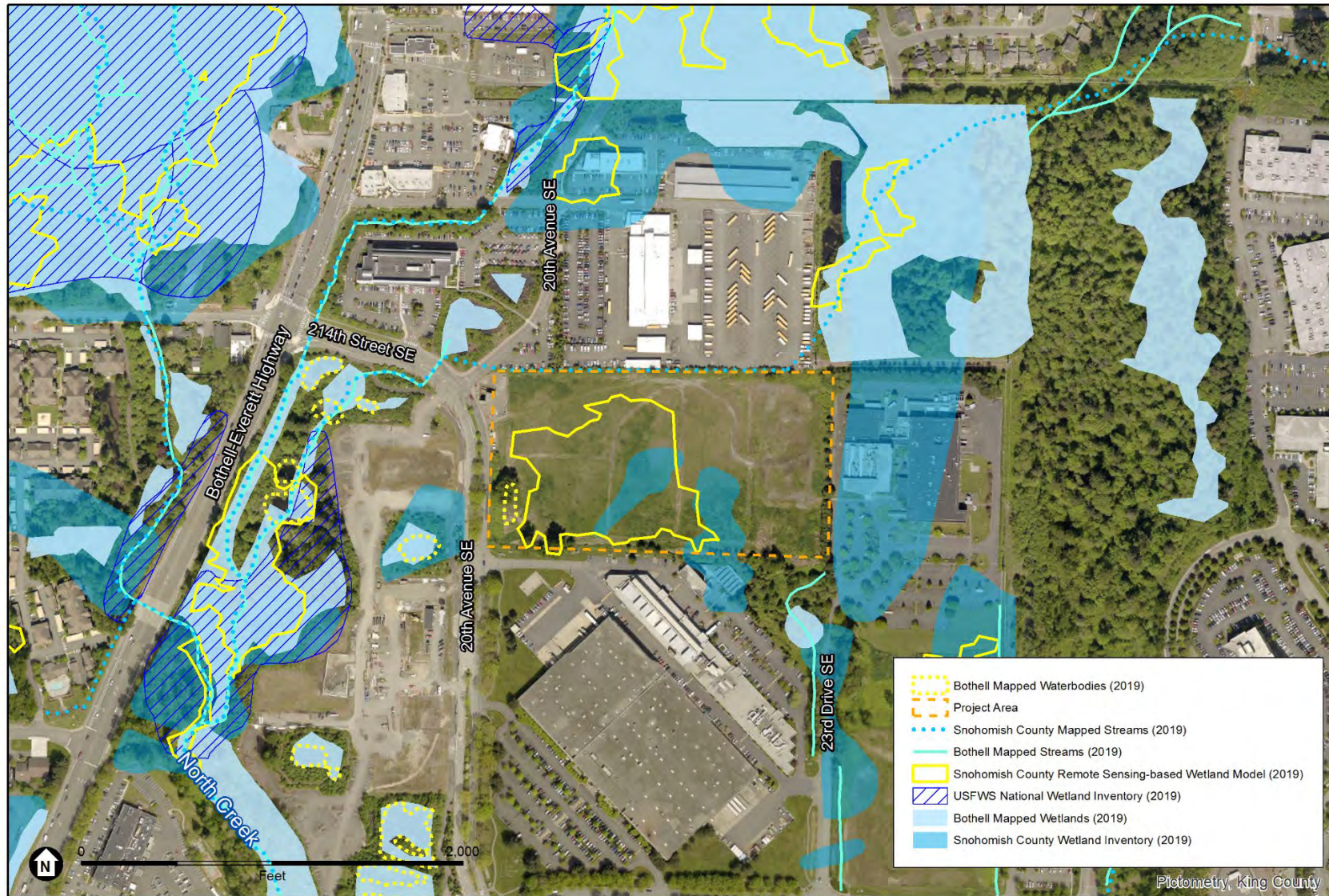


Figure 3-2 Mapped wetlands and streams in project area and vicinity

3.2 Results of field investigation

The following sections describe the results of the field investigations conducted by biologists Jessica Redman, Christina Hersum, and Amanda Brophy on April 8 and 9, and June 5, 2019. An additional site visit was conducted to assess an off-site stream on October 28, 2019. The region received 0.85 inch of precipitation over the 10 days prior to the April 8, 2019 field investigation according to the Mill Creek 1.8 NE, WA NRCS climatological data (NRCS 2019b). Overall, normal climatic conditions occurred over the three months (January 2019 to March 2019) prior to the field investigation based on the Seattle Sand Point, WA NRCS WETS data (Appendix F). Biologists identified the boundaries of two on-site wetlands (WBO-1 and WBO-2), one on-site stream (SBO-1), and one off-site wetland (WBO-3). On-site wetlands were delineated while the boundaries of the off-site wetlands were estimated at a reconnaissance level. The locations of the wetlands and stream delineated within the project area are shown in **Figure 3-3**; the wetland characteristics are summarized in **Table 3-1**; and on-site investigation photos are provided in Appendix A. A detailed discussion of the individual wetlands is provided in Section 3.2.1.

Table 3-1 Wetland characteristics

Wetland Name	Wetland Area within the Project Area (acres)	Hydrogeomorphic Type	Cowardin Class ¹
On-site Wetlands			
WBO-1	0.04	Depressional	PEM/PSS
WBO-2	0.04	Depressional	PEM
Off-site Wetlands			
WBO-3	N/A (off-site)	Depressional	PSS/PFO
WBO-4	N/A (off-site)	Depressional	PAB/PEM/PSS/PFO
WBO-5	N/A (off-site)	Depressional	PEM/PSS
WBO-6	N/A (off-site)	Depressional	PEM/PSS
WBO-7	N/A (off-site)	Depressional	PEM/PSS/PFO

SOURCE: Environmental Science Associates 2019

NOTES: ¹PAB = palustrine aquatic bed, PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested.

3.2.1 On-site wetlands

3.2.1.1 Wetland WBO-1

Overview: Wetland WBO-1 is a depressional, palustrine emergent (PEM) and scrub-shrub (PSS) wetland in the southwest portion of the project area, adjacent to 20th Avenue SE (**Figure 3-3**). The wetland is located in a depression that appears to have been excavated out of the surrounding fill pad. A culvert not contiguous with the wetland is present at the southern extent of the depression, but would only be connected during extreme rain events.. Data plots (DPs) 4 and 5 characterize the wetland, and DP-7 is representative of upland characteristics. Due to the presence of hydrophytic vegetation in both the wetland and the surrounding upland, the wetland boundary was flagged where hydric soil indicators and wetland hydrology were present.



Figure 3-3 Results of on-site wetland and stream investigation and associated buffers

Hydrology: Wetland hydrology indicators included the presence of a high water table within 5 inches of the soil surface and saturation present to the soil surface (A2 and A3). The wetland is supported by groundwater and some surface-water runoff.

Soils: Soils observed at the wetland plot were primarily muck throughout the 16-inch soil profile. Soils were black (10YR 2/1) and met hydric soil indicator Histosol (A1).

Vegetation: Wetland WBO-1 contains a scrub-shrub and emergent plant community. The wetland is dominated by black cottonwood (*Populus balsamifera*) saplings, stinging nettle (*Urtica dioica*), and reed canarygrass (*Phalaris arundinacea*).

Wetland rating and functions: Wetland WBO-1 scored a total of 16 points (Category III) using Ecology's rating system (Hruby 2014, Appendix D). The water quality functions received a high score (8 points); the hydrologic functions received a moderate score (5 points); and the habitat functions received a low score (3 points). The functions of Wetland WBO-1 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this wetland contains dense, uncut herbaceous and woody vegetation that is important for slowing and filtering surface-water runoff. While the wetland is a depression and able to receive and hold stormwater flow, it lacks the capacity necessary to protect downstream areas from flooding due to its relatively small size. Wetland WBO-1 has generally low habitat suitability due to its simple vegetation community, lack of habitat structures, and lack of accessible undisturbed habitat. Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WBO-1 does not provide habitat for fish, as it is not associated with streams and does not regularly export organic matter production from herbaceous plant material. Wildlife use was not observed during the field investigation. The wetland does not provide educational or scientific value since it is in private ownership, it is highly degraded, and it is not locally rare or significant.

3.2.1.2 Wetland WBO-2

Overview: Wetland WBO-2 is a depressional PEM wetland in the southwest portion of the project area, approximately 25 feet east of Wetland WBO-1 (**Figure 3-3**). DP-6 characterizes the wetland, and DP-7 is representative of upland characteristics. Similar to Wetland WBO-1, Wetland WBO-2 is located in a depression that appears to have been excavated out of the surrounding fill pad. The wetland collects stormwater that is piped in through an 8-inch plastic culvert in the southeast extent of the wetland. A stormwater overflow pipe is also located in this area of the wetland. Due to the presence of hydrophytic vegetation in both the wetland and the surrounding upland, the wetland boundary was flagged where hydric soil indicators and wetland hydrology were present.

Hydrology: Wetland hydrology indicators included the presence of a high water table at 2 inches from the soil surface and saturation present to the soil surface (A2 and A3). The central portion of the wetland was inundated during the April site visits. Hydrological inputs include surface-water runoff from adjacent development, which reaches the wetland through a pipe in the southern portion of the wetland.

Soils: Soils observed at the wetland plot were primarily sandy loam with muck and fibrous organics. Soils were black (10YR 2/1) from 0 to 15 inches and were yellowish brown (10YR 5/6) from 15 to 18 inches. Soils met hydric soil indicator Hydrogen Sulfide (A4).

Vegetation: Wetland WBO-2 is dominated by an emergent plant community that is primarily reed canarygrass and fringed willowherb (*Epilobium ciliatum*).

Wetland rating and functions: Wetland WBO-2 scored a total of 17 points (Category III) using Ecology's rating system (Hruby 2014, Appendix D). The water quality functions received a high score (8 points); the hydrologic functions received a moderate score (6 points); and the habitat functions received a low score (3 points). The functions of Wetland WBO-2 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this depressional wetland is downslope of sediment sources and contains dense vegetation that is important for slowing and filtering surface-water runoff. Because the wetland is relatively small, it lacks the capacity to receive and hold stormwater flows necessary to protect downstream areas from flooding. The wetland's general habitat suitability is low because of its low plant species diversity, lack of accessible undisturbed habitat, and lack of large woody debris and other habitat structures. Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WBO-2 does not provide habitat for fish as it is not associated with streams and does not regularly export organic matter production from herbaceous plant material. Wildlife use was not observed during the field investigation. The wetland does not provide educational or scientific value since it is in private ownership, it is highly degraded, and it is not locally rare or significant.

3.2.2 On-site streams

3.2.2.1 Stream SBO-1

Stream SBO-1 is a stream in the northeast corner of the project area (**Figure 3-3**). The stream originates off-site to the north and drains to the south. The stream enters the project area through a perched culvert under a utility corridor to the north, then flows through the project area for approximately 55 feet, and then exits through a culvert off-site adjacent to the eastern boundary of the project area. Off-site, the stream is then piped along the entirety of the eastern boundary of the project area and then flows into Wetland WBO-3 south of the project area. The stream then flows through a series of pipes and ditches along 23rd Drive SE before joining a wetland complex north of North Creek and approximately 0.6-mile south of the project parcel.

Substrate in the stream consists of small gravel and fine sediments. The stream has a bankfull width of approximately 2 to 3 feet with some riffles. During the three site visits, the culvert to the south appeared to be partially blocked, which resulted in the formation of a pool approximately 1 foot deep. The portion of the stream that contained the riffle habitat was distinct from the pool and no riffle and pool complexes were observed. Wetted depths in the portion of the stream upstream of the pool ranged from 3 to 4 inches. Several fish blockages are mapped as occurring downstream. This, combined with the blocked and perched culvert on the site, makes it unlikely that the portion of this stream within the project area supports fish. However, within the project area the slope of the stream was gradual and less than 1 percent and would meet criteria for a fish bearing stream (Type F) per the WAC's definitions (WAC 222-16-303). Therefore, Stream SBO-1 is a Type F water.

3.2.3 Off-site wetlands

Per BMC 14.04.520, the critical areas analysis must also address all wetlands within 300 feet of the project area. Below are the results for the off-site analysis.

3.2.3.1 Wetland WBO-3

Overview: Wetland WBO-3 is protected by the City as a NGPA. Wetland WBO-3 is a depression, PSS and PFO wetland located off-site along the southeast border of the project area (**Figure 3-4**). Wetland WBO-3 is several feet lower in elevation than the project parcel resulting in a change in topography and a change in vegetation type. No hydrologic connection was observed between the project parcel and Wetland WBO-3 during the site visits. However, Stream SBO-1 is connected to the wetland through a culvert offsite, that runs along the edge of the parcel to the east. The wetland boundary was estimated to occur at the toe of slope of the project parcel based on the presence of hydrophytic vegetation and wetland hydrology.

Hydrology: Wetland hydrology indicators included the presence of a high water table and saturation present to the soil surface (A2 and A3). Hydrological inputs include surface-water runoff from adjacent development and a culvert at the north end of the wetland.

Soils: Soils were not investigated in the off-site wetland.

Vegetation: Wetland WBO-3 is dominated by a scrub-shrub and forested plant community that is primarily Himalayan blackberry (*Rubus armeniacus*), red-osier dogwood (*Cornus sericea*), Pacific willow (*Salix lucida*), and black cottonwood.

Wetland rating and functions: Wetland WBO-3 scored a total of 19 points (Category III) using Ecology's rating system (Hruby, 2014, Appendix D). The water quality and hydrologic functions received moderate scores (7 points), and the habitat functions received a low score (5 points). The functions of Wetland WBO-3 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this wetland contains dense woody vegetation that is important for slowing and filtering surface-water runoff; however, the wetland has a slightly constricted outlet providing moderate water quality functions removing sediment load and nutrient removal. While the wetland is a depression and able to receive and hold stormwater flows, it is small compared to the drainage area and the outlet does not allow the wetland to detain high flows. Wetland WBO-3 generally provides low habitat functions because of its simple vegetation community and lack of accessible undisturbed habitat. Using WSDOT's functional analysis tool (Null et al. 2000), the wetland provides habitat for passerine bird species and small mammals; however, it is isolated due to surrounding development, lacks a buffer, and contains low amounts of large woody debris, an important habitat feature for amphibians. The wetland does not provide educational or scientific value since it is in private ownership and it is not rare in the area.

3.2.3.2 Wetland WBO-4

Overview: Wetland WBO-4 is a large depression, palustrine aquatic bed (PAB), PEM, PSS, and PFO wetland complex located off-site northeast of the project area (**Figure 3-4**). Wetland WBO-4 does not extend into the project area due to a dirt utility line access road approximately 4 to 6 feet higher in elevation than the project parcel. The wetland is hydrologically connected to the project parcel by Stream SBO-1 through a culvert that runs under the utility corridor. The wetland boundary was estimated based on the City's wetland mapping (City of Bothell 2019).

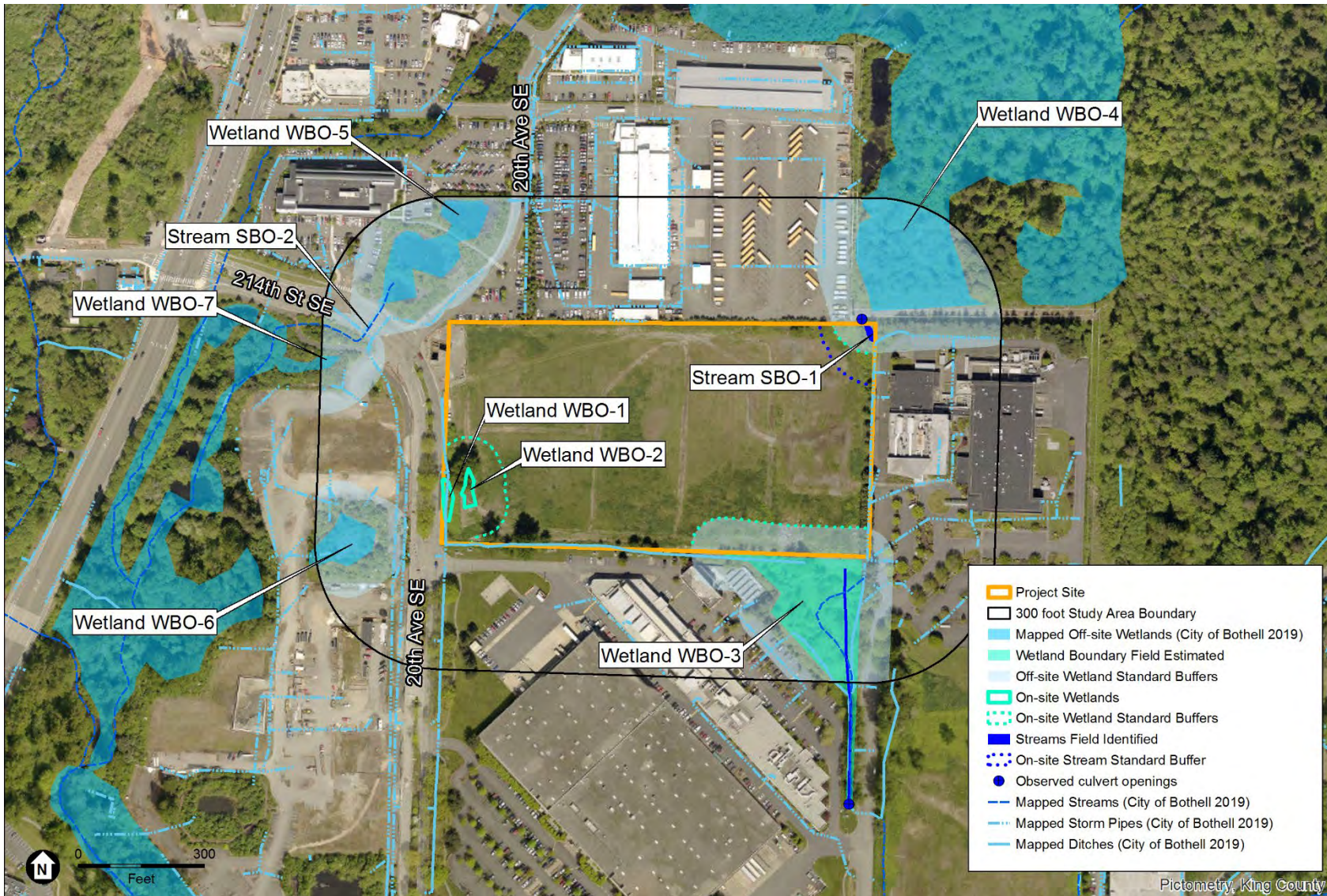


Figure 3-4 Results of off-site wetland and stream investigation and associated buffers

Hydrology: Wetland hydrology indicators include the presence of inundation visible on aerial imagery (B7). Hydrological inputs include precipitation, stream inputs, and likely a high groundwater table.

Soils: Soils were not investigated in the off-site wetland.

Vegetation: Based on street and aerial imagery, Wetland WBO-4 is dominated by an aquatic bed, emergent, scrub-shrub, and forested plant community that is primarily reed canarygrass, willow, red alder (*Alnus rubra*), and black cottonwood (Google Earth Pro 2019).

Wetland rating and functions: Wetland WBO-4 preliminarily scored a total of 20 points (Category II) using Ecology's rating system (Hruby 2014, Appendix D). The water quality and hydrologic functions received high-to-moderate scores (8 and 7 points, respectively), and the habitat functions received a moderate score (5 points). The functions of Wetland WBO-4 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this wetland contains dense woody vegetation that is important for slowing and filtering surface-water runoff. The wetland has a constricted outlet providing moderate water quality functions removing sediment load and nutrient removal. Wetland WBO-4 is depressional and able to receive and hold stormwater flows from surrounding development. Wetland WBO-4 generally provides moderate habitat functions because of its lack of accessible undisturbed habitat and special habitat features. Using WSDOT's functional analysis tool (Null et al. 2000), the wetland provides habitat for passerine bird species and small mammals; however, it is isolated due to surrounding development and lacks a buffer. The wetland does not provide educational or scientific value since the majority of it is in private ownership and it is not rare in the area.

3.2.3.3 Wetland WBO-5

Overview: Wetland WBO-5 is a depressional, PEM and PSS wetland located off-site to the northwest of the project area (**Figure 3-4**). Based on aerial imagery, the wetland appears to have been excavated between 2010 and 2011 for use as stormwater ponds, as inundated depressions appear where a grass field once existed (Google Earth Pro 2019). However, due to its proximity to North Creek it may have historically been wetland associated with the creek's floodplain. Wetland WBO-5 is isolated from the project area by 20th Avenue SE. No hydrologic connection was observed between the project parcel and Wetland WBO-5 during the site visits. The wetland boundary was estimated based on the City's wetland mapping (City of Bothell 2019).

Hydrology: Wetland hydrology indicators include the presence of inundation visible on aerial imagery (B7). Hydrological inputs include precipitation and stormwater inputs.

Soils: Soils were not investigated in the off-site wetland.

Vegetation: Based on street and aerial imagery, Wetland WBO-5 is dominated by an emergent and scrub-shrub plant community that is primarily reed canarygrass, cattail (*Typha latifolia*), willow (*Salix spp.*), rose (*Rosa spp.*), and black cottonwood (Google Earth Pro 2019).

Wetland rating and functions: Wetland WBO-5 preliminarily scored a total of 19 points (Category III) using Ecology's rating system (Hruby 2014, Appendix D). The water quality and hydrologic functions received high-to-moderate scores (7points), and the habitat functions

received a low score (5 points). The functions of Wetland WBO-5 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this depressional wetland receives sediment from upslope sources, which is important for water quality. Because the wetland is relatively small, it lacks the capacity to receive and hold stormwater flows necessary to protect downstream areas from flooding. The wetland's general habitat suitability is low because of its low plant species diversity, lack of accessible undisturbed habitat, and lack of large woody debris and other habitat structures. Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WBO-5 does not provide habitat for fish as it is not associated with streams and has a constricted outlet to export organic matter production from herbaceous plant material. The wetland does not provide educational or scientific value since it is in private ownership, and it is not locally rare or significant.

3.2.3.4 Wetland WBO-6

Overview: Wetland WBO-6 is a depressional, PEM and PSS wetland located off-site to the west of the project area (**Figure 3-4**). Wetland WBO-6 is isolated from the project area by 20th Avenue SE. No hydrologic connection was observed between the project parcel and Wetland WBO-6 during the site visits. Similar to WBO-5, this wetland appears to have been excavated as a stormwater pond and, due to its proximity to North Creek, it may have historically been wetland associated with the creek's floodplain. The wetland boundary was estimated based on the City's wetland mapping (City of Bothell 2019).

Hydrology: Wetland hydrology indicators include the presence of inundation visible on aerial imagery (B7). Hydrological inputs include precipitation and stormwater inputs.

Soils: Soils were not investigated in the off-site wetland.

Vegetation: Based on street and aerial imagery, Wetland WBO-6 is dominated by an emergent and scrub-shrub plant community that is primarily reed canarygrass, rose, and willow (Google Earth Pro 2019).

Wetland rating and functions: Wetland WBO-6 preliminarily scored a total of 18 points (Category III) using Ecology's rating system (Hruby 2014, Appendix D). The water quality and hydrologic functions received a moderate score (7 points), and the habitat functions received a low score (4 points). The functions of Wetland WBO-6 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this depressional wetland receives sediment from upslope sources, which is important for water quality. Wetland WBO-6 is relatively small lacking the capacity to receive and hold stormwater flows necessary to protect downstream areas from flooding. The wetland's general habitat suitability is low because of its low plant species diversity and strata and lack of accessible undisturbed habitat. Using WSDOT's functional analysis tool (Null et al, 2000), Wetland WBO-6 does not provide habitat for fish as it is not associated with streams and has a constricted outlet to export organic matter production from herbaceous plant material. The wetland does not provide educational or scientific value since it is in private ownership, and it is not locally rare or significant.

3.2.3.5 Wetland WBO-7

Overview: Wetland WBO-7 is a large depressional, PEM, PSS, and PFO wetland complex located off-site to the west of the project area (**Figure 3-4**). The wetland is associated with North Creek. Wetland WBO-7 is isolated from the project area by 20th Avenue SE. No hydrologic connection was observed between the project parcel and Wetland WBO-7 during the site visits. The wetland boundary was estimated based on the City's wetland mapping (City of Bothell 2019).

Hydrology: Wetland hydrology indicators include the presence of inundation visible on aerial imagery (B7). Hydrological inputs include precipitation, stream and stormwater inputs, and likely a high groundwater table.

Soils: Soils were not investigated in the off-site wetland.

Vegetation: Based on street and aerial imagery, Wetland WBO-7 is dominated by an emergent, scrub-shrub, and forested plant community that is primarily reed canarygrass, willow, red alder, black cottonwood, and western red cedar (*Thuja plicata*) (Google Earth Pro 2019).

Wetland rating and functions: Wetland WBO-7 preliminarily scored a total of 20 points (Category II) using Ecology's 2014 rating system (Hruby, 2014, Appendix D). The water quality and hydrologic functions received high-to-moderate scores (8 and 6 points, respectively), and the habitat functions received a moderate score (6 points). The functions of Wetland WBO-7 were also assessed using WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Appendix E).

Using Ecology's rating system (Hruby 2014), this wetland contains dense emergent and woody vegetation that is important for slowing and filtering surface-water runoff. Wetland WBO-7 is a depression and able to receive and hold stormwater flows from surrounding development. Wetland WBO-7 generally provides moderate habitat functions because of its lack of accessible undisturbed habitat and special habitat features; however, it provides multiple plant strata with a complex interspersed of plant classes important for wildlife. Using WSDOT's functional analysis tool (Null et al. 2000), the wetland provides habitat for passerine bird species and small mammals; however, it is isolated due to surrounding development and lacks a buffer. The wetland does not provide educational or scientific value since the majority of it is in private ownership, and it is not rare in the area.

3.2.4 Off-site Streams

3.2.4.1 Stream SBO-2

Stream SBO-2 is located outside of the project parcel and is an unnamed tributary to North Creek. SBO-2 is located in the northwestern extent of the study area and flows southwest, approximately 450 feet west of the project parcel. The stream originates in Wetland WBO-5 and flows southwest under 214th Street SE. The stream continues west and southwest before joining North Creek approximately 0.2-mile from the road crossing. SBO-2 is a fish-bearing (Type F) stream with intermittent flow with no documented use by salmonids (WDFW 2019b).

Due to lack of property access, Stream SBO-2 was only observed from the public right-of-way and the OHWM was not delineated. During the October 28, 2019 site visit water was observed in the channel, however no active flow was observed. Along 214th Street SE, water depth was

approximately 1 to 2 feet a the bankfull width was estimated to be approximately 3 to 5 feet. The stream has a low gradient and appeared to flow west into Wetland WBO-7.

4 REGULATORY CONTEXT

Wetlands and streams are regulated at the federal, state, and local levels. Agencies with jurisdiction include the Corps, Ecology, and the City of Bothell. WDFW also regulates work within streams. Regulatory implications associated with development in wetlands include, but may not be limited to, those described in this section. All applicable permits should be obtained prior to developing or otherwise altering streams or wetlands.

4.1 Federal regulatory requirements

The Corps regulates discharges of dredged or fill materials into waters of the United States, including wetlands, under Section 404 of the Clean Water Act. The purpose of the Clean Water Act is to “*restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.*” A Section 404 permit may be required if a proposed project involves filling wetlands or altering streambeds or other waters of the U.S.

The Corps has established two types of permit programs under Section 404: Nationwide and Individual. Nationwide permits are issued when a proposed activity would have minimal adverse impacts on wetlands. All other projects are evaluated under the Individual permitting process. The Corps determines which permitting process is used for a proposed project. The Corps will require that wetland impacts be avoided or minimized to the extent practicable, and mitigation will likely be required for unavoidable wetland impacts.

4.2 State regulatory requirements

The state certification process under Section 401 of the federal Clean Water Act is usually triggered through a Section 404 permit application. Section 401 directs each state to certify that proposed in-water activities will not adversely affect water quality or violate state aquatic protection laws. In Washington State, Ecology is responsible for administering the state certification program. Ecology may issue approval, approval with conditions, denial, or a request for delay due to lack of information. Any conditions attached to the Section 401 certification become part of the Section 404 permit.

If relocation or alteration of stream culverts or other in-stream work is proposed as part of the project, a Hydraulic Project Approval would be required from the WDFW under the state Hydraulic Code (Revised Code of Washington 77.55, WAC 220-110).

All of the wetlands delineated in the project area meet the definition of a wetland and exhibit the required wetland criteria.

4.3 Local regulatory requirements

The City of Bothell regulates critical areas and associated buffers through BMC Chapter 14.04 – Critical Area Regulations, which includes the following: wetlands, fish and wildlife habitat areas, frequently flooded areas, geologically hazardous areas, and critical aquifer recharge areas.

Development of a site with critical areas will require City of Bothell review and approval in accordance with these regulations. The text below addresses the City’s critical area buffers for wetlands and streams only.

4.3.1 Wetland regulatory requirements

Wetlands are classified into Category I, II, III, or IV using the criteria provided in BMC 14.04.500.B. The City of Bothell generally prohibits filling and grading of wetlands and also requires a protective buffer around wetlands to insulate them from potential adverse effects from adjacent development. The size of the wetland buffer is based on the category and habitat scores (20 points or greater, or less than 20 points) per BMC 14.04.530.F.1.a (**Table 4-1**). The City of Bothell’s critical areas code references the 2004 version of Ecology’s wetland rating system in BMC 14.04.520.C.4; however, the wetlands were rated using the 2014 version of the wetland rating system as allowed under BMC 14.04.500.B. Ecology’s “*Tables for translating category scores*” and “*Tables for translating function scores*” were used to translate the 2014 category and habitat scores to the 2004 category and habitat scores to establish the buffer width per BMC 14.04.530.F.1.a (**Table 4-1**; Ecology 2018).

Table 4-1 Wetland rating and applicable buffer distances

Wetland Name	Wetland Location	Wetland Category ¹	Habitat Score ¹	BMC Required Standard Buffer Width (feet)
WBO-1	On-site	III	Less than 20	75
WBO-2	On-site	III	Less than 20	75
WBO-3	Off-site	III	Less than 20	75
WBO-4	Off-site	II	Less than 20	100
WBO-5	Off-site	III	Less than 20	75
WBO-6	Off-site	III	Less than 20	75
WBO-7	Off-site	II	More than 20	105

SOURCE: BMC 14.04.530.F.1.a

NOTES: ¹2014 Wetland Rating System translated to the 2004 Wetland Rating System (Ecology 2018)

The two wetlands in the project area rate as Category III with low habitat scores, requiring a 75-foot standard buffer (BMC 14.04.530.F.1.a). The standard buffers for these wetlands are summarized in **Table 4-1** and shown in **Figure 3-3**.

The five off-site wetlands within 300 feet of the project area rate as Category II and III with low-to-moderate habitat scores. Wetland WBO-3 rates as Category III with a low habitat score, requiring a 75-foot standard buffer (BMC 14.04.530.F.1.a). While Wetlands WBO-4 through WBO-7 rate as Category II and III wetlands with low-to-moderate habitat scores, the standard buffers may be reduced due to roads transecting the buffers. Per BMC 14.04.530.F(4), where established roadways transect the buffer, the buffer edge only extends to the roadway nearest the wetland. It is our professional judgment that this would apply to Wetlands WBO-4 through WBO-7 and, therefore, the buffers of these wetlands would not cross into the project area.

Additionally, Wetland WBO-7 is associated with North Creek, a shoreline of the state, and must be regulated following the City of Bothell's Shoreline Management regulations (BMC Title 13). However, BMC 13.13.020.F.7.b.1 follows the critical areas regulations stating that reduced buffers are allowed if roadways transect the buffer. The standard buffers for these wetlands are summarized in **Table 4-1** and shown in **Figure 3-4**.

4.3.1.1 Buffer reduction, averaging, and allowances for buffer use

The City of Bothell's regulations allow for decreased buffer widths when buffer enhancement, to increase the functions and values of the wetland, is proposed (BMC 14.04.530.F.2). Buffer enhancement is commonly the removal of invasive or non-native vegetation and the subsequent planting of native vegetation.

Buffer averaging, where the buffer width is reduced in one location and increased in another location to maintain the same overall buffer area, is allowed on a case-by-case basis. The minimum buffer width at any point would have to be at least 75 percent of the standard buffer width or 25 feet, whichever is greater. To qualify for wetland buffer averaging, the proposal must include specific criteria such as justification that averaging would have no significant adverse impacts on wetland functions and that the wetland would benefit from a wider or narrower buffer in places (BMC 14.04.530.F.4).

The City of Bothell's standards also provide limited allowances for wetland and wetland buffer uses (BMC 14.04.530.F.8). These allowances are generally applicable to specific site improvements associated with a development proposal, such as allowances for certain stormwater facilities within wetland buffers, restoration activities, and passive recreation facilities.

4.3.1.2 Compensatory mitigation

Avoidable permanent impacts on wetlands and associated buffers would be subject to the mitigation requirements described in BMC 14.04.540. The City of Bothell's mitigation standards would include one or more of the following actions, in order of preference:

1. Permittee Responsible Mitigation, including
 - a. Restoration (reestablishment or rehabilitation)
 - b. Establishment (creation)
 - c. Enhancement of degraded wetlands
2. Purchasing credits from an approved Mitigation Bank in Water Resource Inventory Area 8 if available and feasible
3. Purchasing credits from an approved In-Lieu Fee program if available and feasible

Table 4-2 includes the wetland and wetland buffer mitigation ratios for Category II and III wetlands, as found in the project area and off-site.

Table 4-2 Wetland and buffer mitigation ratios

Wetland Category and Type of Impacted Wetland and Associated Buffer	Restoration or Creation	Enhancement Only
Category II	3:1	Not Applicable
Category III	2:1	3:1 to 6:1

SOURCE: BMC 14.04.540.F, BMC 14.04.540.G

4.3.2 Stream regulatory requirements

According to BMC 14.04.930.D.2, the buffer width assigned to a stream depends on the stream type and presence of salmonids. The on-site stream is regulated as Type F, requiring a 100-foot standard buffer (BMC 14.04.930.D.2). Standard buffers for the stream within the project area are summarized in **Table 4-3** and shown in **Figure 3-3**.

Table 4-3 Stream buffers

Stream Name	Stream Location	Stream Type	BMC Required Standard Buffer Width (feet)
SBO-1	On-site	F	100
SBO-2	Off-site	F	100

SOURCE: BMC 14.04.930.D.2
 NOTES: Np = non-fish perennial

4.3.2.1 Buffer reduction, averaging, and allowances for buffer use

City regulations allow for decreased buffer widths when buffer enhancement to increase the functions and values of the stream is proposed (BMC 14.04.930.D.4).

Buffer averaging, where the buffer width is reduced in one location and increased in another location to maintain the same overall buffer area, is allowed if the reduction would not reduce or degrade stream or habitat functions. The minimum buffer width at any point would have to be at least 75 percent of the standard buffer width.

The City of Bothell’s standards provide limited allowances for aquatic habitats and associated buffers (BMC 14.04.930.E). These allowances are generally applicable to specific site improvements associated with a development proposal, such as allowances for certain utility facilities, rights-of way, and stormwater conveyance facilities.

4.3.2.2 Compensatory mitigation

Avoidable permanent impacts on riparian habitats and associated buffers would be subject to the mitigation requirements described in BMC 14.04.930.D.6 and 14.04.930.D.7. Mitigation must result in equivalent functions and be located as close to the altered area as possible.

5 LIMITATIONS

Within the limitations of schedule, budget, scope-of-work, and seasonal constraints, the biologists warrant that this study was conducted in accordance with generally accepted environmental science practices, including the technical guidelines and criteria in effect at the time this study was performed, as outlined in Section 2 and Appendix B. The results and conclusions of this report represent the authors' best professional judgment based on information provided by the project proponent in addition to that obtained during the course of this study. No other warranty, expressed or implied, is made.

6 SUMMARY

Existing information was reviewed and on-site investigations were conducted to delineate and assess wetlands and streams in the project area. The two on-site wetlands rate as Category III with low habitat scores, requiring 75-foot standard buffers (BMC 14.04.530.F.1.a). The on-site stream is regulated as Type Np, requiring a 75-foot standard buffer (BMC 14.04.930.D.2). The five off-site wetlands within 300 feet of the project area rate as Category II and III with low-to-moderate habitat scores. Wetland WBO-3 rates as Category III with a low habitat score, requiring a 75-foot standard buffer (BMC 14.04.530.F.1.a). While Wetlands WBO-4 through WBO-7 rate as Category II and III wetlands with low-to-moderate habitat scores, the standard buffers may be reduced due to roads transecting the buffers. Per BMC 14.04.530.F(4), where established roadways transect the buffer, the buffer edge only extends to the roadway nearest the wetland. It is our professional judgment that this would apply to Wetlands WBO-4 through WBO-7 and, therefore, the buffers of these wetlands would not cross into the project area.

7 REFERENCES

- Anderson, P., S. Meyer, P. Olson, and E. Stockdale. 2016. *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State*. Shorelands and Environmental Assistance Program, Washington Department of Ecology. Olympia, Washington.
- Bothell, City of. 2019. City of Bothell mapping application. (Internet website: <https://qismaps.bothellwa.gov/H5/index.html?viewer=COBMap>); accessed June 2019.
- Brinson, M. 1993. *A Hydrogeomorphic Classification for Wetlands*. U.S. Army Corps of Engineers, Wetlands Research Program. 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*. FWS/OBS-79/31. U.S. Fish and Wildlife Service.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Google Earth Pro V 7.3.2.5776. 2019. Bothell, Washington, United States of America.
- Hruby, T. 2014. *Washington State Wetland Rating System for Western Washington: 2014 Update*. Publication #14-06-029. Olympia, WA: Washington Department of Ecology.
- Natural Resources Conservation Service (NRCS). 2019a. Web Soil Survey. (Internet website: <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>); accessed June 2019.
- Natural Resources Conservation Service (NRCS). 2019b. Agricultural Applied Climate Information System. US Department of Agriculture, Natural Resources Conservation Service. (Internet website: https://efotg.sc.egov.usda.gov/efotg_locator.aspx); accessed June 2019.
- Null, W., G. Skinner, and W. Leonard. 2000. *Wetland Functions Characterization Tool for Linear Projects*. Washington State Department of Transportation, Environmental Affairs Office. Olympia, Washington.
- Snohomish County. 2019. Planning and Development Services Map Portal. (Internet website: <http://qismaps.snoco.org/Html5Viewer/Index.html?viewer=pdsmapportal>); accessed April 2019.
- Sound Transit. 2016. *Sound Transit 3 (ST3) System Plan*.
- U.S. Army Corps of Engineers (Corps). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region*. Version 2. Wetlands Regulatory Assistance Program. May 2010. ERDC/EL TR-10-3. (Internet website: http://www.usace.army.mil/CECW/Documents/cecwo/reg/west_mt_finalsupp.pdf.)
- U.S. Army Corps of Engineers (Corps). 2014. *A Guide to Ordinary High Water Mark (OHWM) Delineation for Non-Perennial Streams in the Western Mountains, Valleys, and Coast Region of the United States*. Wetlands Regulatory Assistance Program (WRAP). Hanover, New Hampshire.
- U.S. Fish and Wildlife Service (USFWS). 2019. National Wetlands Inventory Wetland Mapper. (Internet website: <http://www.fws.gov/wetlands/Data/Mapper.html>); accessed June 2019.

Washington Department of Ecology (Ecology). 2018. Tables for translating category scores and function scores. (Internet website: <https://ecology.wa.gov/Water-Shorelines/Wetlands/Tools-resources/Rating-systems>); accessed June 2019.

Washington Department of Fish and Wildlife (WDFW). 2019a. Priority Habitats and Species data. Olympia, Washington. (Internet website: <http://apps.wdfw.wa.gov/phsontheweb/>); accessed June 2019.

Washington Department of Fish and Wildlife (WDFW). 2019b. SalmonScape fish database and mapping application. Olympia, Washington. (Internet website: <https://apps.wdfw.wa.gov/salmonscape/map.html>); accessed June 2019.

Washington Department of Natural Resources (WDNR). 2019. Natural Heritage Program Wetlands of High Conservation Value. (Internet website: <http://wadnr.maps.arcgis.com/apps/webappviewer/index.html?id=5cf9e5b22f584ad7a4e2aebc63c47bda>); accessed June 2019.

Appendix A

On-site Investigation Photos



Photo 1. North end of Wetland WBO-1 facing south



Photo 2. South end of Wetland WBO-2 facing north



Photo 3. Northwest end of Wetland WBO-3 facing southeast



Photo 4. East side of Wetland WBO-3 facing north



Photo 5. Northwest side of Stream SBO-1 facing southeast



Photo 6. Stream SBO-1 stream bed

Appendix B

Wetland Determination Methods

Wetland Definition and Delineation

Wetlands are formally defined by the U.S. Army Corps of Engineers (Corps) (Federal Register 1982), the U.S. Environmental Protection Agency (EPA) (Federal Register 1988), the Washington Shoreline Management Act (SMA) of 1971, and the Washington State Growth Management Act (GMA) as follows:

... those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Federal Register, 1982, 1986).

In addition, the SMA and the GMA definitions add:

Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990 that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificially created wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.

Methods defined in Western Mountains, Valleys, and Coast Regional Supplement (Corps 2010) to the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual (Manual; Environmental Laboratory 1987) were used to determine the presence and extent of wetlands in the study area. These methods are also consistent with state requirements in WAC 173-22-035.

The methodology outlined in the manuals is based on three essential characteristics of wetlands: (1) hydrophytic vegetation; (2) hydric soils; and (3) wetland hydrology. Field indicators of these three characteristics must all be present in order to determine that an area is a wetland (unless problem areas or atypical situations are encountered). These characteristics are described below.

The “routine on-site determination method” was used to determine wetland boundaries that had not been previously delineated. Formal data plots were established where information regarding each of the three wetland parameters (vegetation, soils, and hydrology) was recorded. This information was used to distinguish wetlands from non-wetlands. If wetlands were determined to be present within the study area, wetland boundaries were delineated with sequentially numbered colored pin flags or flagging. Data plot locations were also marked with colored flagging. Data sheets for each of the formal data plots evaluated for this study are provided in Appendix C.

Vegetation

Plants must be specially adapted for life under saturated or anaerobic conditions to grow in wetlands. The U.S. Fish and Wildlife Service (USFWS) has determined the estimated probability of each plant species’ occurrence in wetlands and has accordingly assigned a “wetland indicator status” (WIS) to each species. Plants are categorized as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL). Definitions for each indicator status are listed below. Species with an indicator status of OBL, FACW, or FAC are

considered adapted for life in saturated or anaerobic soil conditions. Such species are referred to as “hydrophytic” vegetation.

Key to Wetland Indicator Status codes:

OBL Obligate: species that almost always occur in wetlands under natural conditions (est. probability >99%).

FACW Facultative wetland: species that usually occur in wetlands (est. probability 67 to 99%), but are occasionally found in non-wetlands.

FAC Facultative: Species that are equally likely to occur in wetlands or non-wetlands (est. probability 34 to 66%).

FACU Facultative upland: species that usually occur in non-wetlands (est. probability 67 to 99%), but are occasionally found in wetlands.

UPL Upland: species that almost always occur in non-wetlands under normal conditions (est. probability >99%).

Areas of relatively homogeneous vegetative composition can be characterized by “dominant” species. The indicator status of the dominant species within each vegetative stratum is used to determine if the plant community may be characterized as hydrophytic. The vegetation of an area is considered to be hydrophytic if more than 50% of the dominant species have an indicator status of OBL, FACW, or FAC. The Regional Supplement provides additional tests for evaluating the presence of hydrophytic vegetation communities, including the prevalence index, morphological adaptations, and wetland non-vascular plants. The Regional Supplement also addresses difficult situations where hydrophytic vegetation indicators are not present but hydric soils and wetland hydrology are observed.

Soils

Hydric soils are indicative of wetlands. Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (Federal Register 1994). The Natural Resources Conservation Service (NRCS), in cooperation with the National Technical Committee for Hydric Soils, has compiled lists of hydric soils (NRCS 1995). These lists identify soil series mapped by the NRCS that meet hydric soil criteria. It is common, however, for a map unit of non-wetland (non-hydric) soil to have inclusions of hydric soil, and vice versa. Therefore, field examination of soil conditions is important to determine if hydric soil conditions exist.

The NRCS has developed a guide for identifying field indicators of hydric soils (NRCS 2018). This list of hydric soil indicators is considered to be dynamic; revisions occur on a regular basis as a result of ongoing studies of hydric soils. In general, anaerobic conditions create certain characteristics in hydric soils, collectively known as “redoximorphic features,” that can be observed in the field (Vepraskas 1999). Redoximorphic features include high organic content, accumulation of sulfidic material (rotten egg odor), greenish- or bluish-gray color (gley formation), spots or blotches of different color interspersed with the dominant or matrix color (mottling), and dark soil colors (low soil chroma) (NRCS 2018; Vepraskas 1999). Soil colors are described both by common color name (for example, “dark brown”) and by a numerical

description of their hue, value, and chroma (for example, 10YR 2/2) as identified on a Munsell soil color chart (Munsell Color 2010). Soil color is determined from a moist soil sample.

The Regional Supplement provides methods for difficult situations where hydric soil indicators are not observed, but indicators of hydrophytic vegetation and wetland hydrology are present.

Hydrology

Water must be present for wetlands to exist; however, it need not be present throughout the entire year. Wetland hydrology is considered to be present if soils are saturated to the ground surface, or if the water table is less than or equal to 12 inches below the surface for 14 or more consecutive days during the growing season at a minimum frequency of 5 years in 10 (NRC 1995). Indicators of wetland hydrology include observation of ponding or soil saturation, water marks, drift lines, drainage patterns, sediment deposits, oxidized rhizospheres, water-stained leaves, and local soil survey data. Where positive indicators of wetland hydrology are observed, it is assumed that wetland hydrology occurs for a sufficient period of the growing season to meet the wetland criteria. The Regional Supplement provides methods for evaluating situations in wetlands that periodically lack indicators of wetland hydrology but where hydric soils and hydrophytic vegetation are present.

Classifying Wetlands

Two classification systems are commonly used to describe wetlands. The hydrogeomorphic (HGM) system describes wetlands in terms of their position in the landscape and the movement of water in the wetland (Brinson 1993). The USFWS classification system (Cowardin et al. 1979) describes wetlands in terms of their vegetation communities; these include, for example, emergent, scrub-shrub, and forested community types.

Assessing Wetland Functions

The City of Bothell specifies the use of the Washington State Department of Ecology's (Ecology's) Washington State Wetland Rating System for Western Washington—Revised (Hruby 2014) for rating wetlands. Ecology developed this rating system to differentiate wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the beneficial functions they provide to society (Hruby 2014). Although this system is designed to rate wetlands, it is based on whether a particular wetland performs a particular function and the relative level to which the function is performed. An assessment of wetland functions is inherent in the rating system. Appendix D provides the completed rating forms for the project.

In addition to rating a particular wetland, the rating system also provides a qualitative assessment of several wetland functions, including water quality improvement, flood flow alteration, and wildlife habitat. Wetlands are given points based on a series of questions regarding water quality, hydrologic, and habitat functions, and then scored into four categories: Category I (highest score) through Category IV (lowest score). Because detailed scientific knowledge of wetland functions is limited, evaluations of the functions of individual wetlands are somewhat qualitative and dependent on professional judgment.

References

- Brinson, M.M. 1993. A hydrogeomorphic classification for wetlands, Technical Report WRP–DE–4, U.S. Army Corps of Engineers Engineer Waterways Experiment Station, Vicksburg, MS.
- Corps (U.S. Army Corps of Engineers). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. Version 2. Wetlands Regulatory Assistance Program. May 2010. ERDC/EL TR-10-3.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. FWS/OBS-79/31. U.S. Fish and Wildlife Service.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Mississippi.
- Hruby, T. 2014. Washington State Wetland Rating System for Western Washington – Revised. October 2014. Ecology publication number 14-06-029. Olympia, WA.
- Munsell Color. 2010. Munsell Soil Color Charts. GretagMacbeth, New Windsor, New York.
- NRC (National Research Council). 1995. Wetlands: Characteristics and Boundaries. National Academy Press, Washington, DC.
- NRCS (Natural Resources Conservation Service). 1995. *Hydric Soils List for Washington*. Revised December 15, 1995.
- NRCS (Natural Resources Conservation Service). 2018. Field Indicators of Hydric Soils in the United States - A Guide for Identifying and Delineating Hydric Soils. Version 8.2, 2018.
- Vepraskas, M.J. 1999. Redoximorphic Features for Identifying Aquic Conditions. Technical Bulletin 301. North Carolina Agricultural Research Service, North Carolina State University, Raleigh, North Carolina.

Appendix C

Wetland Delineation Data Sheets

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-1
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 2
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: WGS 84
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____ = Total Cover			
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Juncus effusus</u>	30	Y	FACW	
2. <u>Phalaris arundinacea</u>	25	Y	FACW	
3. <u>Rumex occidentalis</u>	2	N	FACW	
4. <u>Poa sp.</u>	65	N	Unknown	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	57 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____ = Total Cover			
% Bare Ground in Herb Stratum _____				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 2 (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:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 6/28/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-1A
 Investigator(s): JR, AB Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): A Lat: 47.802183 Long: --122.2052 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. <u>Populus balsamifera</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Alnus rubra</u>	<u>15</u>	<u>N</u>	<u>FAC</u>	
3. _____				
4. _____				
	<u>95</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Rubus armeniacus</u>	<u>95</u>	<u>Y</u>	<u>FAC</u>	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 = _____
2. _____				
3. _____				
4. _____				
5. _____				
Herb Stratum (Plot size: <u>3m R</u>)				
1. _____				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Woody Vine Stratum (Plot size: _____)				
1. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
_____ = Total Cover				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>100</u>				
Remarks:				

SOIL

Sampling Point: DP-1A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-4	10YR 3/4	100					loam	lots of organics and roots
4-10	10YR 2/1	100					loam	
10-15	10YR 2/2	100					loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Restrictive Layer (if present): Type: <u>rock/fill</u> Depth (inches): <u>15</u>	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
-----------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

Remarks:

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one required; check all that apply)</u>			<u>Secondary Indicators (2 or more required)</u>		
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)			
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____			Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:					
Remarks: dry					

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-2
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): streambank Local relief (concave, convex, none): concave Slope (%): 3
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: WGS 84
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation , Soil X, 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Along streambank adjacent to utility corridor; likely fill	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. <u>Alnus rubra</u>	<u>70</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>70</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Rubus armeniacus</u>	<u>50</u>	<u>Y</u>	<u>FAC</u>	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 = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>50</u>	= Total Cover		
Herb Stratum (Plot size: <u>3m R</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	_____	= Total Cover		
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
	_____	= Total Cover		
% Bare Ground in Herb Stratum _____				

Remarks: RUAR recently cut

SOIL

Sampling Point: DP-2

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-16	10YR 3/1	100					SalO	Cobbles/fill material throughout w/some organic material

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

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

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

Hydric Soil Present? Yes No

Remarks: Soils likely fill from adjacent utility corridor

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 4" _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): surf _____	

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

Remarks: likely within OHWM of stream during times of higher flow

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 6/28/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-2A
 Investigator(s): JR, AB Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 0
 Subregion (LRR): A Lat: 47.802216 Long: --122.205446 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. <u>Populus balsamifera</u>	<u>80</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Alnus rubra</u>	<u>15</u>	<u>N</u>	<u>FAC</u>	
3. _____				
4. _____				
	<u>95</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Rubus armeniacus</u>	<u>95</u>	<u>Y</u>	<u>FAC</u>	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 = _____
2. _____				
3. _____				
4. _____				
5. _____				
Herb Stratum (Plot size: <u>3m R</u>)				
1. _____				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Woody Vine Stratum (Plot size: _____)				
1. _____				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____				
_____ = Total Cover				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>100</u>				

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-3
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): shallow swale Local relief (concave, convex, none): concave Slope (%): 3
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD 83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation X, Soil X, 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Rubus armeniacus</u>	<u>20</u>	<u>Y</u>	<u>FAC</u>	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 = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>20</u> = Total Cover				
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	<u>100</u>	<u>Y</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>100</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				

SOIL

Sampling Point: DP-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)							
Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0-14	10YR 2/2	100				SiLo	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) 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 <input type="checkbox"/> No <input checked="" type="checkbox"/>
--------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:	
<u>Primary Indicators (minimum of one required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Salt Crust (B11) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<u>Secondary Indicators (2 or more required)</u> <input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)
Field Observations: Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>4"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:	
Remarks:	

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-4
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 3
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD 83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation X, Soil X, 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: located in upland between Wetland WBO-1 and culvert in southwest corner of property; soils likely fill	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Rubus armeniacus</u>	<u>7</u>	<u>Y</u>	<u>FAC</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>7</u> = Total Cover			
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	<u>90</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Verbascum thaspus</u>	<u>4</u>	<u>N</u>	<u>NL</u>	
3. <u>Urtica dioica</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
4. <u>Senecio vulgaris</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Cirsium vulgare</u>	<u>3</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>125</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____ = Total Cover			
% Bare Ground in Herb Stratum _____				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (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:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

SOIL

Sampling Point: DP-4

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-4	10YR 2/1	100					SiLo	w/organic material
4-12	10YR 3/2	100					sand	w/cobbles

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

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

Restrictive Layer (if present):
 Type: cobble
 Depth (inches): 12"

Hydric Soil Present? Yes No

Remarks:
 Fill at 12"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>10"</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>surf</u>	
(includes capillary fringe)		

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

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-5
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 3
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: WGS 84
 Soil Map Unit Name: Mukilteo Muck NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation X, Soil X, 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: In depressional swale along 20 th Ave SE; Wetland WBO-2	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Populus balsamifera (saplings)</u>	30	Y	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	30 = Total Cover			
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	10	N	FACW	
2. <u>Urtica dioica</u>	20	Y	FAC	
3. <u>Senecia jacobaea</u>	70	Y	FACU	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	100 = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____ = Total Cover			
% Bare Ground in Herb Stratum _____				
Remarks:				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (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:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: DP-5

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-16	10YR 2/1	100					muck	

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

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

<input checked="" type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

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

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

Hydric Soil Present? Yes No

Remarks: Hydrogen sulfide odor in test pit approximately 20 feet to the south

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A) <input type="checkbox"/> Other (Explain in Remarks)
	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) (LRR A) <input type="checkbox"/> Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Water Table Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 5"	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (includes capillary fringe)	Depth (inches): surf	

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

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-6
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 4
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck/Everett very gravelly sandy loam, 0 to 8 % slopes NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
 Are Vegetation X, Soil X, 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: In large ponded depression; Wetland WBO-2	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____ = Total Cover			
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	<u>100</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Epilobium ciliatum</u>	<u>3</u>	<u>N</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>103</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____ = Total Cover			
% Bare Ground in Herb Stratum _____				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 1 (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:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-7
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: _____
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Upland plot to Wetland WBO-1 and WBO-2; soils likely fill	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. <u>Rubus armeniacus</u>	10	Y	FAC	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 = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	15	Y	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Epilobium ciliatum</u>	5	Y	FACW	
3. <u>Urtica dioica</u>	5	Y	FAC	
4. <u>White-flowered weed (unknown)</u>	25	N	Unknown	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				

SOIL

Sampling Point: DP-7

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-10	10YR 2/1	100					SiLo	
10-18	10YR 2/2	97	10YR 3/3	3	C	M	SiLo	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

³Indicators 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:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (2 or more required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>17"</u>	
Saturation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>15"</u>	
(includes capillary fringe)			

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

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/8/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-8
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: <u>10m R</u>)					
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover	_____	_____	_____		
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)					
1. _____	_____	_____	_____	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 = _____	
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover	_____	_____	_____		
Herb Stratum (Plot size: <u>3m R</u>)					
1. <u>Phalaris arundinacea</u>	<u>95</u>	<u>Y</u>	<u>FACW</u>		
2. <u>Galium aparine</u>	<u>2</u>	<u>N</u>	<u>FACU</u>		
3. <u>Taraxacum officinale</u>	<u>2</u>	<u>N</u>	<u>FACU</u>		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
_____ = Total Cover	<u>99</u>	_____	_____		
Woody Vine Stratum (Plot size: _____)					
1. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2. _____	_____	_____	_____		
_____ = Total Cover	_____	_____	_____		
% Bare Ground in Herb Stratum _____					

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: DP-8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-5	10YR 2/2	100					Loam	
5-18	10YR 2/2	97					Loam	with gravel

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	

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

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
--------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:		
<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (2 or more required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	
Saturation Present? (includes capillary fringe) Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____	

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

Remarks:

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/9/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-9
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____ = Total Cover			
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	<u>90</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Poa sp.</u>	<u>5</u>	<u>N</u>	<u>unknown</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>90</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____ = Total Cover			
% Bare Ground in Herb Stratum _____				
Remarks:				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 1 (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:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/9/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-10
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. _____	_____	_____	_____	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 = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	<u>trace</u>	<u>N</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Poa sp.</u>	<u>70</u>	<u>N</u>	<u>Unknown</u>	
3. <u>Juncus effusus</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>	
4. <u>Vicia sativa</u>	<u>3</u>	<u>N</u>	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>28</u> = Total Cover				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum _____				
Remarks:				

SOIL

Sampling Point: DP-10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-6	10YR 2/2	100					SaLo	with gravels and grass roots
6-16	10YR 2/2	99	7.5YR 2.5/2	1	C	M	SaLo	with gravels
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.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> 2 cm Muck (A10)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)			<input type="checkbox"/> Very Shallow Dark Surface (TF12)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input type="checkbox"/> Other (Explain in Remarks)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Matrix (F3)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)					
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)					
<input type="checkbox"/> Restrictive Layer (if present):								
Type: _____								
Depth (inches): _____						Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)	
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)	
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)	
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)	
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 15'	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): 13'	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks:			

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

Project/Site: ST Bus Base North City/County: Bothell Sampling Date: 4/9/2019
 Applicant/Owner: Sound Transit State: WA Sampling Point: DP-11
 Investigator(s): JR, CH Section, Township, Range: 29/27N/5E
 Landform (hillslope, terrace, etc.): fill pad Local relief (concave, convex, none): concave Slope (%): 1
 Subregion (LRR): A Lat: 47.80291 Long: -122.2039 Datum: NAD83
 Soil Map Unit Name: Mukilteo Muck NWI classification: UPL

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

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>10m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	_____ = Total Cover			
Sapling/Shrub Stratum (Plot size: <u>5m R</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____ = Total Cover			
Herb Stratum (Plot size: <u>3m R</u>)				
1. <u>Phalaris arundinacea</u>	<u>65</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Poa sp.</u>	<u>20</u>	<u>N</u>	<u>unknown</u>	
3. <u>Ranunculus repens</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. <u>Vicia sativa</u>	<u>3</u>	<u>N</u>	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>73</u> = Total Cover			
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____ = Total Cover			
% Bare Ground in Herb Stratum _____				
Remarks:				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 1 (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:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

SOIL

Sampling Point: DP-11

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-7	10YR 2/2	100					SaLo	with gravels and grass roots
7-16	10YR 2/2	97	10YR 4/3	3	C	M	SaLo	with gravels and large cobbles

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

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

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

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

<u>Primary Indicators (minimum of one required; check all that apply)</u>		<u>Secondary Indicators (2 or more required)</u>
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		

Field Observations:

Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
(includes capillary fringe)			

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

Remarks:

Appendix D

Wetland Rating System Forms and Figures

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-1 Date of site visit: 4/8/2018

Rated by J. Redman 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 ESRI

OVERALL WETLAND CATEGORY III (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
- X** **Category III** - Total score = 16 - 19
- Category IV** - Total score = 9 - 15

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	H	L	L	
Landscape Potential	M	M	L	
Value	H	M	L	Total
Score Based on Ratings	8	5	3	16

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

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	1
Hydroperiods	D 1.4, H 1.2	2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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:

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).	points = 3	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u>		Yes = 4 No = 0
D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u>		
Wetland has persistent, ungrazed, plants > 95% of area	points = 5	5
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. <u>Characteristics of seasonal ponding or inundation:</u>		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	2
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		Add the points in the boxes above
		13

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	0
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?		0
Source	Yes = 1 No = 0	
Total for D 2		Add the points in the boxes above
		1

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)?		2
Total for D 3		Add the points in the boxes above
		4

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
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	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	
D 4.2. <u>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.</u>		
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	0
<input type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	3
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
Total for D 4		Add the points in the boxes above 5


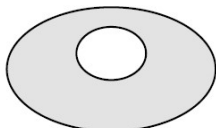

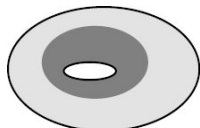
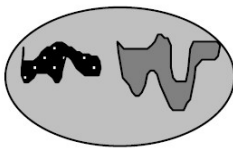
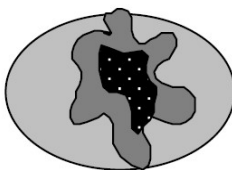
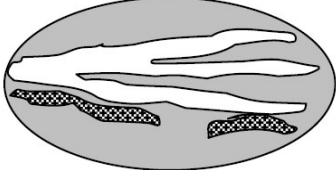

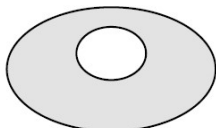

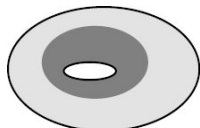
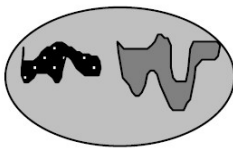
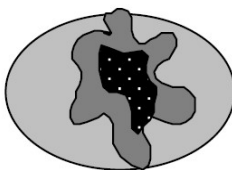
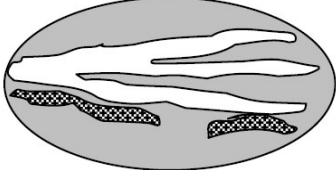

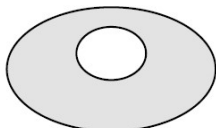

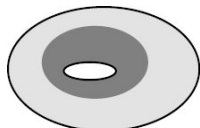
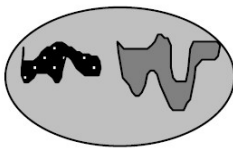
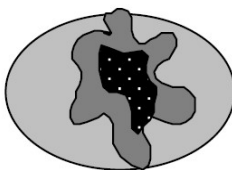
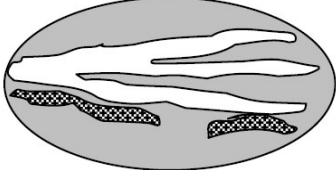
Rating of Site Potential If score is: 12 - 16 = H 6 - 11 = M 0 - 5 = L Record the rating on the first page

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	0
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 2

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):		
<ul style="list-style-type: none"> <input type="checkbox"/> Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	points = 2	1
<input checked="" type="checkbox"/> Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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 1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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: <i>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.</i>		1															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><input type="checkbox"/> Aquatic bed</td> <td style="width: 50%;">4 structures or more: points = 4</td> </tr> <tr> <td><input checked="" type="checkbox"/> Emergent</td> <td>3 structures: points = 2</td> </tr> <tr> <td><input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover)</td> <td>2 structures: points = 1</td> </tr> <tr> <td><input type="checkbox"/> Forested (areas where trees have > 30% cover)</td> <td>1 structure: points = 0</td> </tr> <tr> <td colspan="2"><i>If the unit has a Forested class, check if:</i></td> </tr> <tr> <td><input type="checkbox"/> The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon</td> <td></td> </tr> </table>			<input type="checkbox"/> Aquatic bed	4 structures or more: points = 4	<input checked="" type="checkbox"/> Emergent	3 structures: points = 2	<input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points = 1	<input type="checkbox"/> Forested (areas where trees have > 30% cover)	1 structure: points = 0	<i>If the unit has a Forested class, check if:</i>		<input type="checkbox"/> The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon				
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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 (<i>see text for descriptions of hydroperiods</i>).		1															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;"><input type="checkbox"/> Permanently flooded or inundated</td> <td style="width: 50%;">4 or more types present: points = 3</td> </tr> <tr> <td><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td>3 types present: points = 2</td> </tr> <tr> <td><input type="checkbox"/> Occasionally flooded or inundated</td> <td>2 types present: points = 1</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturated only</td> <td>1 types present: points = 0</td> </tr> <tr> <td><input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Lake Fringe wetland</td> <td style="text-align: right;">2 points</td> </tr> <tr> <td><input type="checkbox"/> Freshwater tidal wetland</td> <td style="text-align: right;">2 points</td> </tr> </table>			<input type="checkbox"/> Permanently flooded or inundated	4 or more types present: points = 3	<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present: points = 2	<input type="checkbox"/> Occasionally flooded or inundated	2 types present: points = 1	<input checked="" type="checkbox"/> Saturated only	1 types present: points = 0	<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland		<input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland		<input type="checkbox"/> Lake Fringe wetland	2 points	<input type="checkbox"/> Freshwater tidal wetland
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<input type="checkbox"/> Freshwater tidal wetland	2 points																
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft ² . <i>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</i>		1															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">If you counted:</td> <td style="width: 50%;">> 19 species</td> <td style="width: 30%; text-align: right;">points = 2</td> </tr> <tr> <td></td> <td>5 - 19 species</td> <td style="text-align: right;">points = 1</td> </tr> <tr> <td></td> <td>< 5 species</td> <td style="text-align: right;">points = 0</td> </tr> </table>			If you counted:	> 19 species	points = 2		5 - 19 species	points = 1		< 5 species	points = 0						
If you counted:	> 19 species	points = 2															
	5 - 19 species	points = 1															
	< 5 species	points = 0															
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i>		1															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">None = 0 points</td> <td style="text-align: center;">Low = 1 point</td> <td colspan="2" style="text-align: center;">Moderate = 2 points</td> </tr> <tr> <td colspan="4" style="padding-top: 20px;"> All three diagrams in this row are HIGH = 3 points </td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td colspan="2" style="text-align: center;"></td> </tr> </table>							None = 0 points	Low = 1 point	Moderate = 2 points		All three diagrams in this row are HIGH = 3 points						
																	
None = 0 points	Low = 1 point	Moderate = 2 points															
All three diagrams in this row are HIGH = 3 points																	
																	

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		0
<input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long)		
<input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland		
<input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)		
<input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)		
<input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)		
<input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)		
Total for H 1		4
Rating of Site Potential If Score is: <input type="checkbox"/> 15 - 18 = H <input type="checkbox"/> 7 - 14 = M <input checked="" type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> 10 % undisturbed habitat + (_____ 5 % moderate & low intensity land uses / 2) = 12.5%		1
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		
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> 25 % undisturbed habitat + (_____ 10 % moderate & low intensity land uses / 2) = 30%		1
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		
H 2.3 Land use intensity in 1 km Polygon: If		-2
> 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0		
Total for H 2		0
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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.		0
Site meets ANY of the following criteria: points = 2		
<input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page)		
<input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)		
<input type="checkbox"/> It is mapped as a location for an individual WDFW priority species		
<input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources		
<input type="checkbox"/> It has been categorized as an important habitat site in a local or 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		
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input type="checkbox"/> 1 = M <input checked="" type="checkbox"/> 0 = L <i>Record the rating on the first page</i>		

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2 </div>	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3 </div>	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
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 <div style="text-align: right;"> <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2 </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4 </div> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog </div>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-2 Date of site visit: 4/8/2018

Rated by J. Redman 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 ESRI

OVERALL WETLAND CATEGORY III (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
- X** **Category III** - Total score = 16 - 19
- Category IV** - Total score = 9 - 15

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	H	M	L	
Landscape Potential	M	M	L	
Value	H	M	L	Total
Score Based on Ratings	8	6	3	17

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

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	1
Hydroperiods	D 1.4, H 1.2	2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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:

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet).	points = 3	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
D 1.2. <u>The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions).</u>		Yes = 4 No = 0
D 1.3. <u>Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</u>		
Wetland has persistent, ungrazed, plants > 95% of area	points = 5	5
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. <u>Characteristics of seasonal ponding or inundation:</u>		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	2
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		Add the points in the boxes above
		13

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	0
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?		0
Source	Yes = 1 No = 0	
Total for D 2		Add the points in the boxes above
		1

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)?		2
Yes = 2 No = 0		
Total for D 3		Add the points in the boxes above
		4

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	2
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	
D 4.2. <u>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.</u>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
<input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	3
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
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	0
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	2

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	1
<input checked="" type="checkbox"/> • Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input checked="" type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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	1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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

0

H 1.2. Hydroperiods

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

- 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 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**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft². *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

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

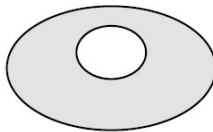
1

H 1.4. Interspersion of habitats

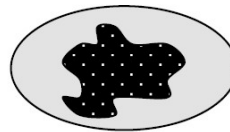
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



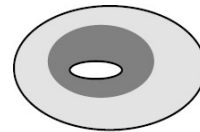
None = 0 points



Low = 1 point

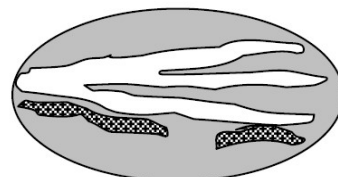
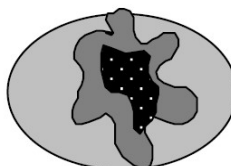
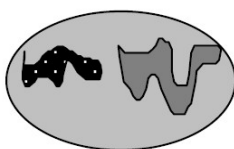


Moderate = 2 points



0

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



H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		
<input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) <input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)		0
Total for H 1		2
Rating of Site Potential If Score is: <input type="checkbox"/> 15 - 18 = H <input type="checkbox"/> 7 - 14 = M <input checked="" type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> 10 % undisturbed habitat + (_____ 5 % moderate & low intensity land uses / 2) = 12.5%		
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		1
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> 25 % undisturbed habitat + (_____ 10 % moderate & low intensity land uses / 2) = 30%		
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		1
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		
Total for H 2		0
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan		0
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		
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input type="checkbox"/> 1 = M <input checked="" type="checkbox"/> 0 = L <i>Record the rating on the first page</i>		

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2 </div>	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3 </div>	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
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 <div style="text-align: right;"> <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
SC 3.0. Bogs	
Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2 </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4 </div> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog </div>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-3 Date of site visit: 6/4/2019

Rated by A. Brophy Trained by Ecology? Yes No Date of training Oct-18

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 ESRI

OVERALL WETLAND CATEGORY III (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
- X** **Category III** - Total score = 16 - 19
- Category IV** - Total score = 9 - 15

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	M	M	M	
Landscape Potential	M	H	L	
Value	H	M	M	Total
Score Based on Ratings	7	7	5	19

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

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	7
Hydroperiods	D 1.4, H 1.2	8
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	8
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	7
Map of the contributing basin	D 4.3, D 5.3	9
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	10
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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:

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).	points = 3	1
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input checked="" type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
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	points = 5	5
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	2
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		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 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		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	2
Total for D 3		4

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	1
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	
D 4.2. <u>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.</u>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
<input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	3
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	7


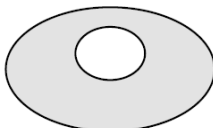

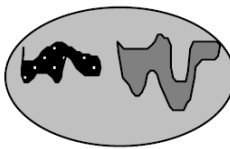
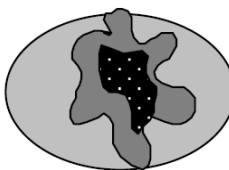
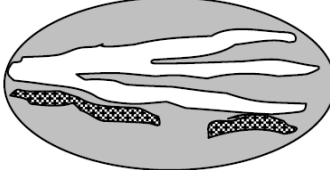
Rating of Site Potential If score is: 12 - 16 = H 6 - 11 = M 0 - 5 = L Record the rating on the first page

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):		1
<ul style="list-style-type: none"> Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	points = 2	
<input checked="" type="checkbox"/> <ul style="list-style-type: none"> Surface flooding problems are in a sub-basin farther down-gradient. 	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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	1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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?	
<p>H 1.1. Structure of plant community: <i>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.</i></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <ul style="list-style-type: none"> <input type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent <input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover) <p><i>If the unit has a Forested class, check if:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon </div> <div style="width: 35%; font-size: small;"> <p>4 structures or more: points = 4</p> <p>3 structures: points = 2</p> <p>2 structures: points = 1</p> <p>1 structure: points = 0</p> </div> </div>	1
<p>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 (<i>see text for descriptions of hydroperiods</i>).</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <ul style="list-style-type: none"> <input type="checkbox"/> Permanently flooded or inundated <input checked="" type="checkbox"/> Seasonally flooded or inundated <input type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input checked="" type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake Fringe wetland <input type="checkbox"/> Freshwater tidal wetland </div> <div style="width: 35%; font-size: small;"> <p>4 or more types present: points = 3</p> <p>3 types present: points = 2</p> <p>2 types present: points = 1</p> <p>1 types present: points = 0</p> </div> </div>	2
<p>H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>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</i></p> <p>If you counted:</p> <div style="display: flex; justify-content: space-between; font-size: small;"> <div style="width: 60%;"> <p>> 19 species</p> <p>5 - 19 species</p> <p>< 5 species</p> </div> <div style="width: 35%;"> <p>points = 2</p> <p>points = 1</p> <p>points = 0</p> </div> </div>	1
<p>H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersions 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. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i></p> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <p style="margin-top: 10px;">All three diagrams in this row are HIGH = 3 points</p>	2

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		
<input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) <input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)	2	
Total for H 1	Add the points in the boxes above	8
Rating of Site Potential If Score is: <input type="checkbox"/> 15 - 18 = H <input checked="" type="checkbox"/> 7 - 14 = M <input type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> $10\% \text{ undisturbed habitat} + (\text{ } 10\% \text{ moderate \& low intensity land uses} / 2) = 15\%$		
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. <i>Calculate:</i> $15\% \text{ undisturbed habitat} + (\text{ } 15\% \text{ moderate \& low intensity land uses} / 2) = 22.5\%$		
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	1	
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		
Total for H 2	Add the points in the boxes above	1
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan	1	
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		
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input checked="" type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L		<i>Record the rating on the first page</i>

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
<p>SC 1.0. Estuarine Wetlands</p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <p><input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt</p> <p style="text-align: right;"><input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2</p>	
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25)</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.</p> <p style="text-align: right;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 2.0. Wetlands of High Conservation Value (WHCV)</p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;"><input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3</p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV</p> <p>SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</p> <p style="text-align: right;"><input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV</p> <p>SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV</p>	
<p>SC 3.0. Bogs</p> <p>Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p>SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?</p> <p style="text-align: right;"><input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2</p> <p>SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?</p> <p style="text-align: right;"><input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog</p> <p>SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p> <p>SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, 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?</p> <p style="text-align: right;"><input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog</p>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> At least $\frac{3}{4}$ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than $\frac{1}{10}$ ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-4 Date of site visit: 6/4/2019

Rated by A. Brophy Trained by Ecology? Yes No Date of training Oct-18

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 ESRI

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

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	M	M	M	
Landscape Potential	M	H	L	
Value	H	M	M	Total
Score Based on Ratings	8	7	5	20

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

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	11
Hydroperiods	D 1.4, H 1.2	12
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	12
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	11
Map of the contributing basin	D 4.3, D 5.3	13
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	14
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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:

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).	points = 3	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
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	points = 5	5
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	2
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		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		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	2
Total for D 3		4

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	2
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	
D 4.2. <u>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.</u>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
<input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	3
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
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):		1
<ul style="list-style-type: none"> Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	points = 2	
<input checked="" type="checkbox"/> <ul style="list-style-type: none"> Surface flooding problems are in a sub-basin farther down-gradient. 	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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	1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		
<input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) <input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)	2	
Total for H 1	Add the points in the boxes above	14
Rating of Site Potential If Score is: <input type="checkbox"/> 15 - 18 = H <input checked="" type="checkbox"/> 7 - 14 = M <input type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> $5\% \text{ undisturbed habitat} + (\text{ } 5\% \text{ moderate \& low intensity land uses} / 2) = 7.5\%$		
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. <i>Calculate:</i> $15\% \text{ undisturbed habitat} + (\text{ } 15\% \text{ moderate \& low intensity land uses} / 2) = 22.5\%$		
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	1	
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		
Total for H 2	Add the points in the boxes above	-1
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan	1	
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		
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input checked="" type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L		<i>Record the rating on the first page</i>

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2 </div>	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3 </div>	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
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 <div style="text-align: right;"> <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2 </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4 </div> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog </div>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-5 Date of site visit: 6/4/2019

Rated by A. Brophy Trained by Ecology? Yes No Date of training Oct-18

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 ESRI

OVERALL WETLAND CATEGORY III (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
- X** **Category III** - Total score = 16 - 19
- Category IV** - Total score = 9 - 15

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	M	M	M	
Landscape Potential	M	H	L	
Value	H	M	M	Total
Score Based on Ratings	7	7	5	19

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

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	15
Hydroperiods	D 1.4, H 1.2	16
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	16
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	15
Map of the contributing basin	D 4.3, D 5.3	17
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	18
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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:

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).	points = 3	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
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	points = 5	1
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	4
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		7

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		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	2
Total for D 3		4

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	2
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	
D 4.2. <u>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.</u>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
<input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	3
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	8


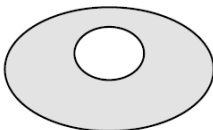



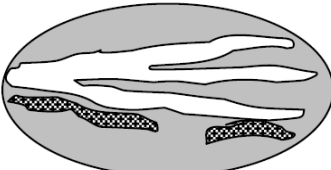
Rating of Site Potential If score is: 12 - 16 = H 6 - 11 = M 0 - 5 = L Record the rating on the first page

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):		1
<ul style="list-style-type: none"> Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	points = 2	
<input checked="" type="checkbox"/> <ul style="list-style-type: none"> Surface flooding problems are in a sub-basin farther down-gradient. 	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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	1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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?	
<p>H 1.1. Structure of plant community: <i>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.</i></p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <ul style="list-style-type: none"> <input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent <input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) <input type="checkbox"/> Forested (areas where trees have > 30% cover) <p><i>If the unit has a Forested class, check if:</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon </div> <div style="width: 35%; font-size: small;"> <p>4 structures or more: points = 4</p> <p>3 structures: points = 2</p> <p>2 structures: points = 1</p> <p>1 structure: points = 0</p> </div> </div>	1
<p>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 (<i>see text for descriptions of hydroperiods</i>).</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Permanently flooded or inundated <input checked="" type="checkbox"/> Seasonally flooded or inundated <input type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake Fringe wetland <input type="checkbox"/> Freshwater tidal wetland </div> <div style="width: 35%; font-size: small;"> <p>4 or more types present: points = 3</p> <p>3 types present: points = 2</p> <p>2 types present: points = 1</p> <p>1 types present: points = 0</p> </div> </div>	2
<p>H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>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</i></p> <p>If you counted:</p> <div style="display: flex; justify-content: space-between; font-size: small;"> <div style="width: 60%;"> <ul style="list-style-type: none"> > 19 species 5 - 19 species < 5 species </div> <div style="width: 35%;"> <p>points = 2</p> <p>points = 1</p> <p>points = 0</p> </div> </div>	1
<p>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. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i></p> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <p>All three diagrams in this row are HIGH = 3 points</p>	1

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		3
<input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long)		
<input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland		
<input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)		
<input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)		
<input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)		
<input checked="" type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)		
Total for H 1		8
Rating of Site Potential If Score is: <input type="checkbox"/> 15 - 18 = H <input checked="" type="checkbox"/> 7 - 14 = M <input type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> 0 % undisturbed habitat + (_____ 1 % moderate & low intensity land uses / 2) = 0.5%		
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. <i>Calculate:</i> 35 % undisturbed habitat + (_____ 20 % moderate & low intensity land uses / 2) = 45%		
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		1
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		
Total for H 2		-1
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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		1
<input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page)		
<input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)		
<input type="checkbox"/> It is mapped as a location for an individual WDFW priority species		
<input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources		
<input type="checkbox"/> It has been categorized as an important habitat site in a local or 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		
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input checked="" type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L <i>Record the rating on the first page</i>		

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2 </div>	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3 </div>	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
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 <div style="text-align: right;"> <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2 </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4 </div> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog </div>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> At least $\frac{3}{4}$ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than $\frac{1}{10}$ ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-6 Date of site visit: 6/4/2019

Rated by A. Brophy Trained by Ecology? Yes No Date of training Oct-18

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 ESRI

OVERALL WETLAND CATEGORY III (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
- X** **Category III** - Total score = 16 - 19
- Category IV** - Total score = 9 - 15

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	M	M	L	
Landscape Potential	M	H	L	
Value	H	M	M	Total
Score Based on Ratings	7	7	4	18

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

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	15
Hydroperiods	D 1.4, H 1.2	16
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	16
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	15
Map of the contributing basin	D 4.3, D 5.3	17
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	18
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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	

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:

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).	points = 3	2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
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	points = 5	5
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	2
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		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		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	2
Total for D 3		4

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	2
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	
D 4.2. <u>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.</u>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
<input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	3
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
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	1
<input checked="" type="checkbox"/> • Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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	1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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 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**

1

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft². *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

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

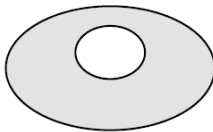
1

H 1.4. Interspersion of habitats

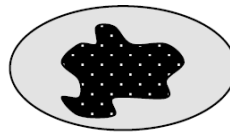
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



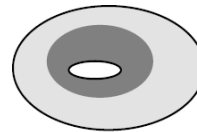
None = 0 points



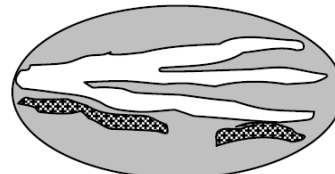
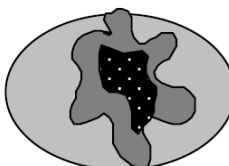
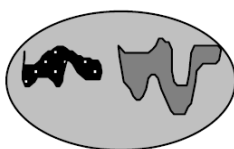
Low = 1 point



Moderate = 2 points



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



1

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		
<input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) <input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)	2	
Total for H 1	Add the points in the boxes above	6
Rating of Site Potential If Score is: <input type="checkbox"/> 15 - 18 = H <input type="checkbox"/> 7 - 14 = M <input checked="" type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> 0% undisturbed habitat + ($\underline{\hspace{2cm}}$ % moderate & low intensity land uses / 2) = 0.5%		
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. <i>Calculate:</i> 35% undisturbed habitat + ($\underline{\hspace{2cm}}$ % moderate & low intensity land uses / 2) = 45%		
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	1	
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		
Total for H 2	Add the points in the boxes above	-1
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan	1	
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		
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input checked="" type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L		<i>Record the rating on the first page</i>

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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2 </div>	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3 </div> SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div> 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 <div style="text-align: right;"> <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV </div> 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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i> 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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2 </div> 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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog </div> 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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4 </div> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p> 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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog </div>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> 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.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WBO-7 Date of site visit: 6/4/2019

Rated by A. Brophy Trained by Ecology? Yes No Date of training Oct-18

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 ESRI

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

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>List appropriate rating (H, M, L)</i>				
Site Potential	H	L	H	
Landscape Potential	M	H	L	
Value	H	M	M	Total
Score Based on Ratings	8	6	6	20

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

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	19
Hydroperiods	D 1.4, H 1.2	20
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	20
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	19
Map of the contributing basin	D 4.3, D 5.3	21
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	22
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	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 (<i>can be added to another figure</i>)	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
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 (<i>can be added to another figure</i>)	S 4.1	
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	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:

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).	points = 3	1
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet.	points = 2	
<input checked="" type="checkbox"/> Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 1	
<input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch.	points = 1	
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	4
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	points = 5	5
Wetland has persistent, ungrazed, plants > 1/2 of area	points = 3	
Wetland has persistent, ungrazed plants > 1/10 of area	points = 1	
Wetland has persistent, ungrazed plants < 1/10 of area	points = 0	
D 1.4. Characteristics of seasonal ponding or inundation:		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland	points = 4	2
Area seasonally ponded is > 1/4 total area of wetland	points = 2	
Area seasonally ponded is < 1/4 total area of wetland	points = 0	
Total for D 1		12

Add the points in the boxes above

12**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		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	2
Total for D 3		4

Add the points in the boxes above

4**Rating of Value** If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

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. <u>Characteristics of surface water outflows from the wetland:</u>		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	1
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	
D 4.2. <u>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.</u>		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
<input checked="" type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
<input type="checkbox"/> 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	
D 4.3. <u>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.</u>		
<input type="checkbox"/> The area of the basin is less than 10 times the area of the unit	points = 5	0
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	
<input type="checkbox"/> Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	4

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):		1
<ul style="list-style-type: none"> Flooding occurs in a sub-basin that is immediately down-gradient of unit. 	points = 2	
<input checked="" type="checkbox"/> <ul style="list-style-type: none"> Surface flooding problems are in a sub-basin farther down-gradient. 	points = 1	
<input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.	points = 1	
<input type="checkbox"/> 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	
<input type="checkbox"/> There are no problems with flooding downstream of the wetland.	points = 0	
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	1

Rating of Value If score is: 2 - 4 = H 1 = M 0 = L Record the rating on the first page

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i>		3
<input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) <input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (see H 1.1 for list of strata)		
Total for H 1 Add the points in the boxes above		
Rating of Site Potential If Score is: <input checked="" type="checkbox"/> 15 - 18 = H <input type="checkbox"/> 7 - 14 = M <input type="checkbox"/> 0 - 6 = L <i>Record the rating on the first page</i>		

H 2.0. Does the landscape have the potential to support the habitat function of the site?		
H 2.1 Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> 1 % undisturbed habitat + (_____ 0 % moderate & low intensity land uses / 2) = 1% 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. <i>Calculate:</i> 35 % undisturbed habitat + (_____ 20 % moderate & low intensity land uses / 2) = 45% 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		1
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		-1
Rating of Landscape Potential If Score is: <input type="checkbox"/> 4 - 6 = H <input type="checkbox"/> 1 - 3 = M <input checked="" type="checkbox"/> < 1 = L <i>Record the rating on the first page</i>		

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 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or 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		1
Rating of Value If Score is: <input type="checkbox"/> 2 = H <input checked="" type="checkbox"/> 1 = M <input type="checkbox"/> 0 = L <i>Record the rating on the first page</i>		

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.**

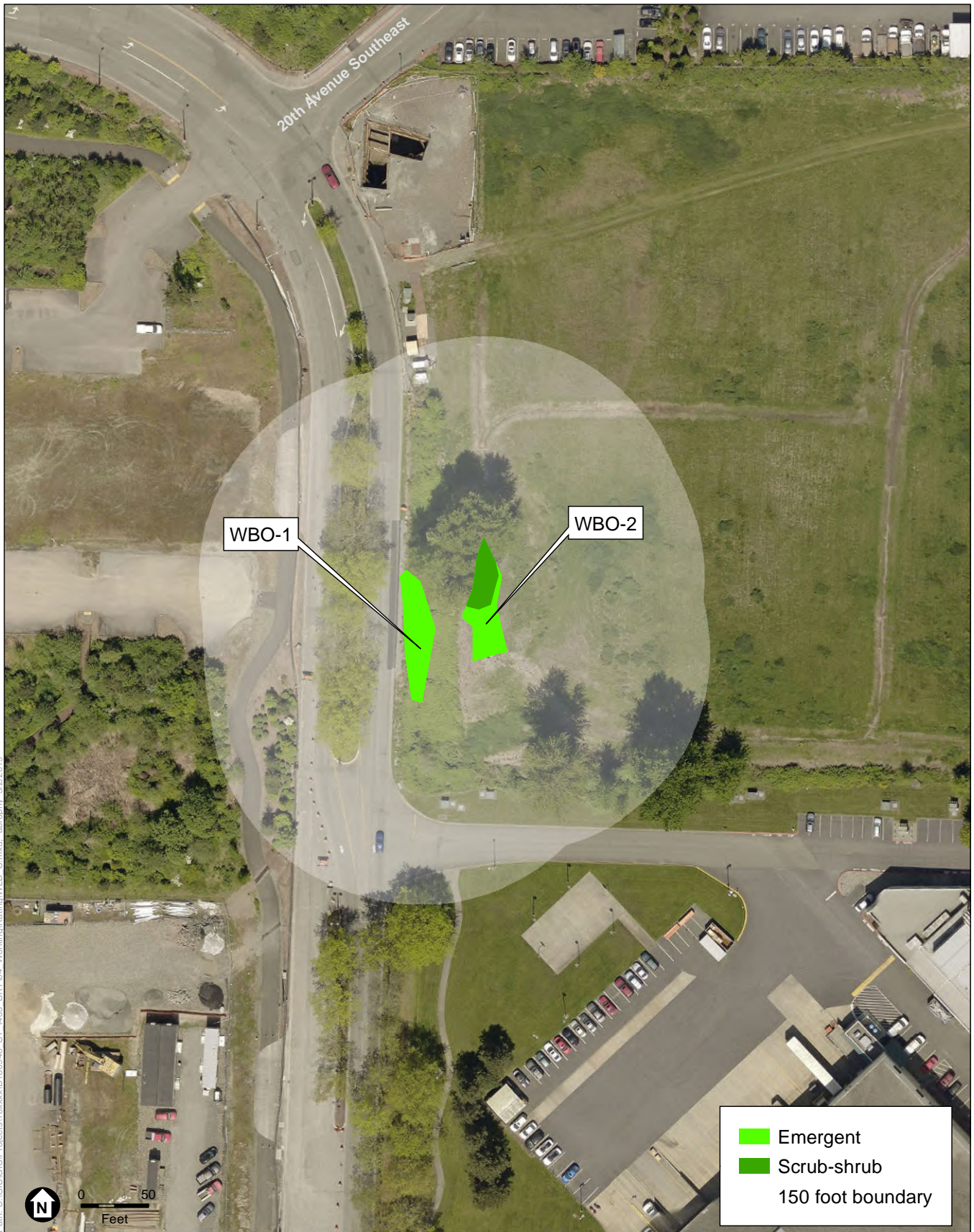
- Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- Herbaceous Balds:** Variable size patches of grass 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	Category
<i>Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 1.1 <input type="checkbox"/> No = Not an estuarine wetland </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 1.2 </div>	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 2.2 <input type="checkbox"/> No - Go to SC 2.3 </div>	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
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 <div style="text-align: right;"> <input type="checkbox"/> Yes - Contact WNHP/WDNR and to SC 2.4 <input type="checkbox"/> No = Not WHCV </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not WHCV </div>	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No - Go to SC 3.2 </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes - Go to SC 3.3 <input type="checkbox"/> No = Is not a bog </div>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No - Go to SC 3.4 </div> <p>NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p>	
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? <div style="text-align: right;"> <input type="checkbox"/> Yes = Is a Category I bog <input type="checkbox"/> No = Is not a bog </div>	

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <p><input type="checkbox"/> Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> Mature forests (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Not a forested wetland for this section</p>	
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p><input type="checkbox"/> Yes - Go to SC 5.1 <input type="checkbox"/> No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> At least $\frac{3}{4}$ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than $\frac{1}{10}$ ac (4350 ft²)</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No = Category II</p>	
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p><input type="checkbox"/> Yes - Go to SC 6.1 <input type="checkbox"/> No = Not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?</p> <p><input type="checkbox"/> Yes = Category I <input type="checkbox"/> No - Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</p> <p><input type="checkbox"/> Yes = Category II <input type="checkbox"/> No - Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?</p> <p><input type="checkbox"/> Yes = Category III <input type="checkbox"/> No = Category IV</p>	
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

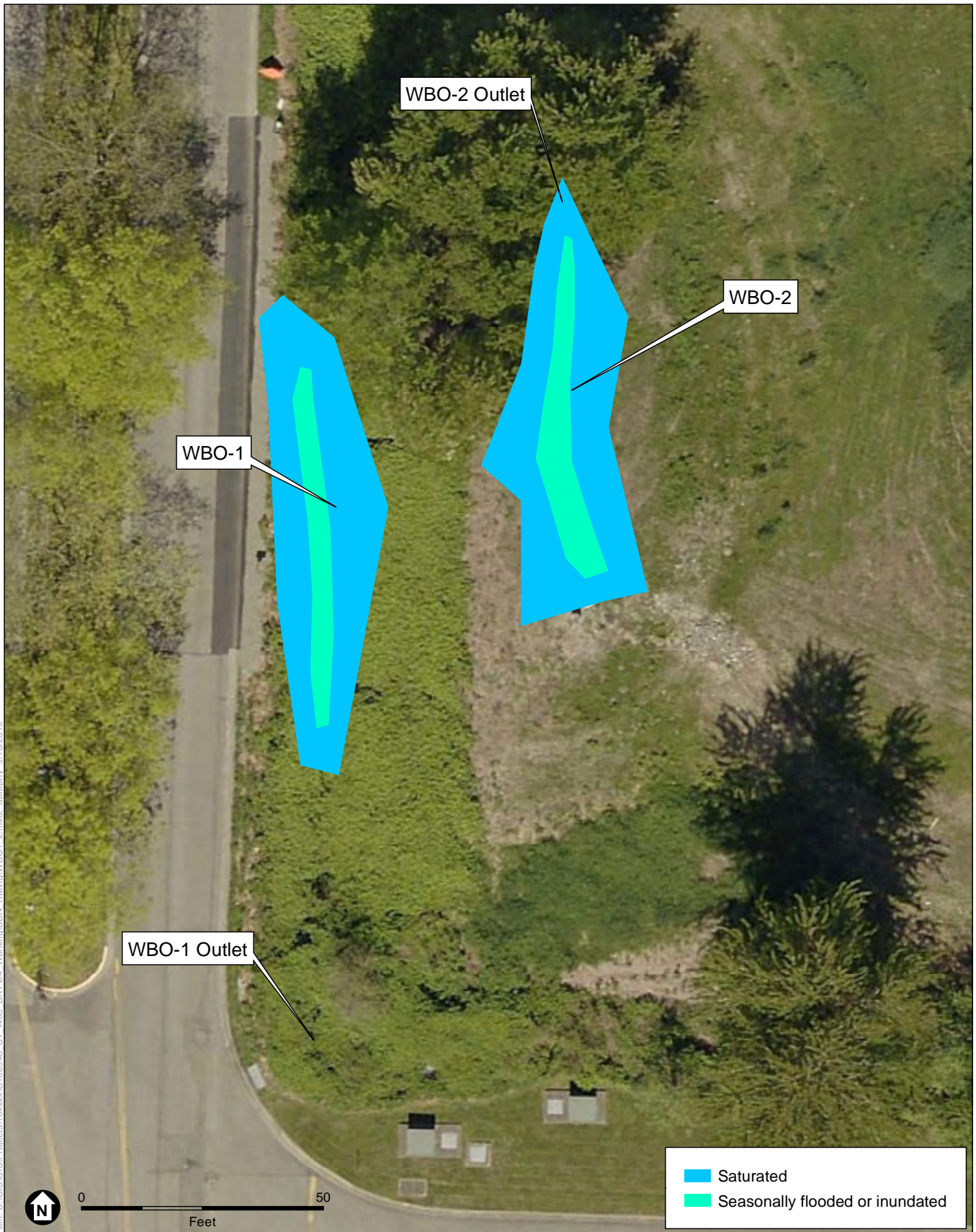


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SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

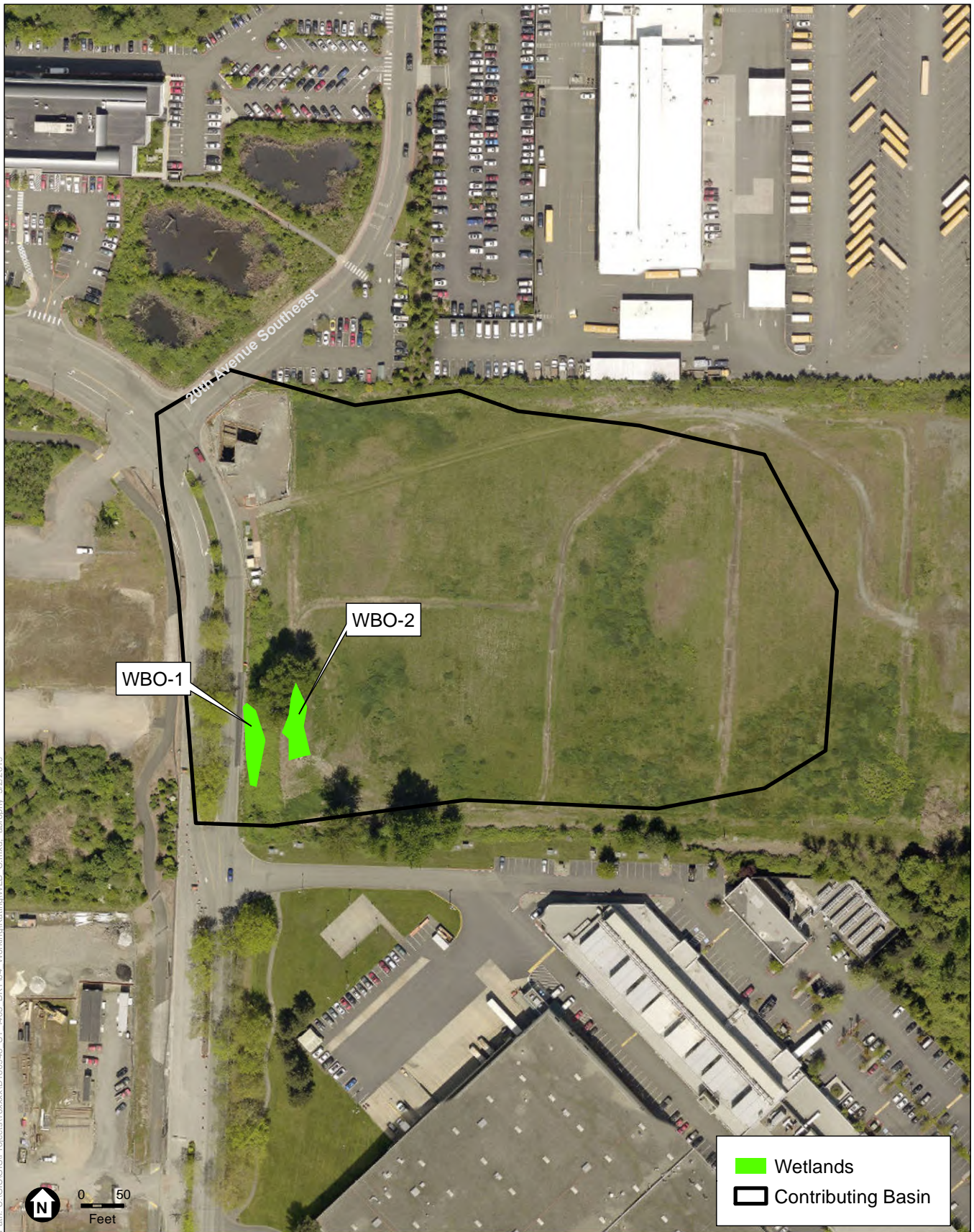
Figure 1
WBO-1 and WBO-2 Cowardin plant classes and boundary of area within 150 feet
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

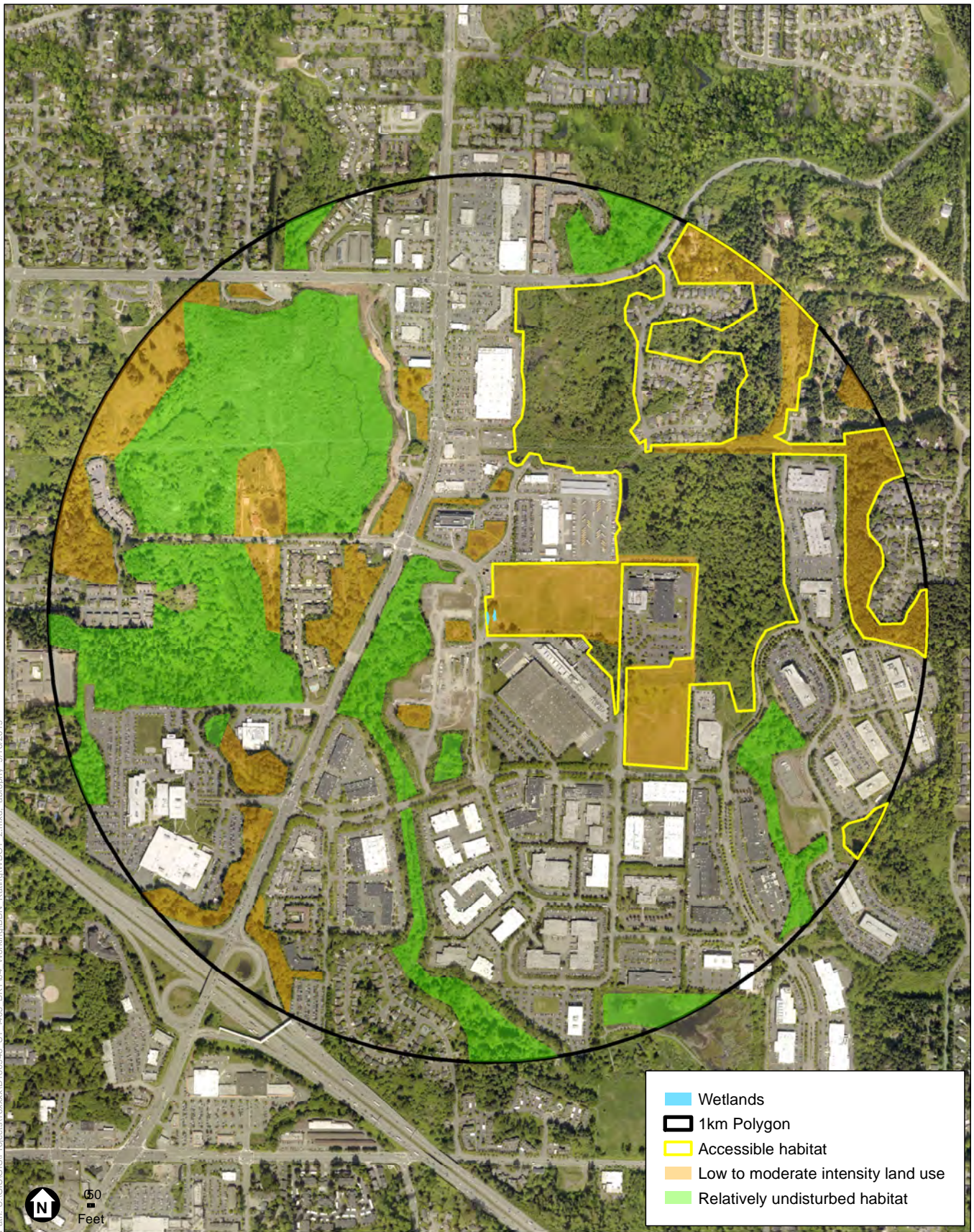
Figure 2
 WBO-1 and WBO-2 hydroperiods and location of outlets
 Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

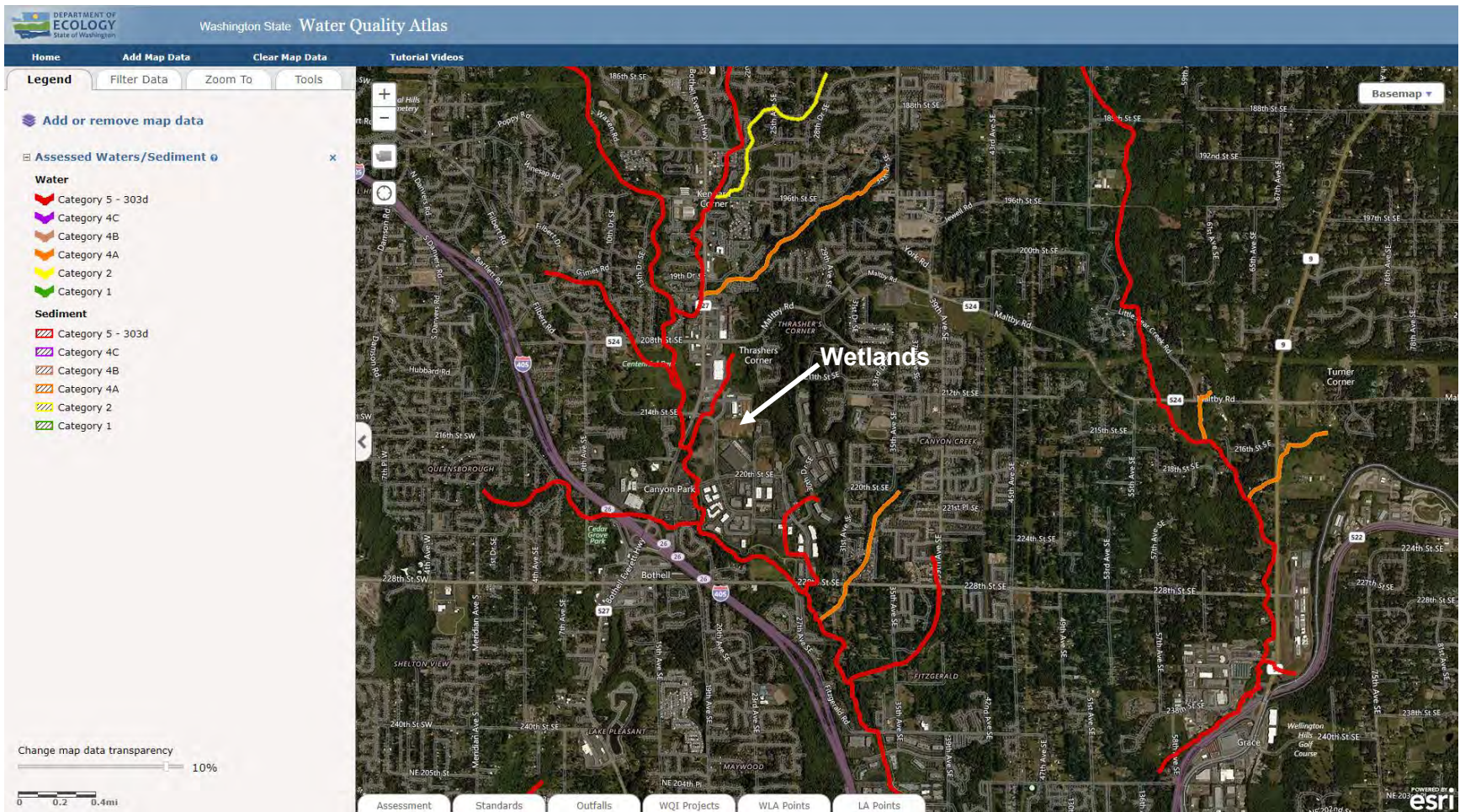
Figure 3
WBO-1 and WBO-2 contributing basin
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 4
 WBO-1 and WBO-2 accessible habitat
 Bothell, Washington




SOURCE: Ecology, 2019

D160948.15 Sound Transit I-405 BRT Bus Base North
Figure 5
 Screen capture of map of 303(d) listed waters in basin
 Bothell, Washington



**North Creek Fecal Coliform
Total Maximum Daily Load**

Submittal Report

June 2002
Publication Number 02-10-020
 *Printed on Recycled Paper*

SOURCE: Ecology, 2002

D160948.15 Sound Transit I-405 BRT Bus Base North

Figure 6

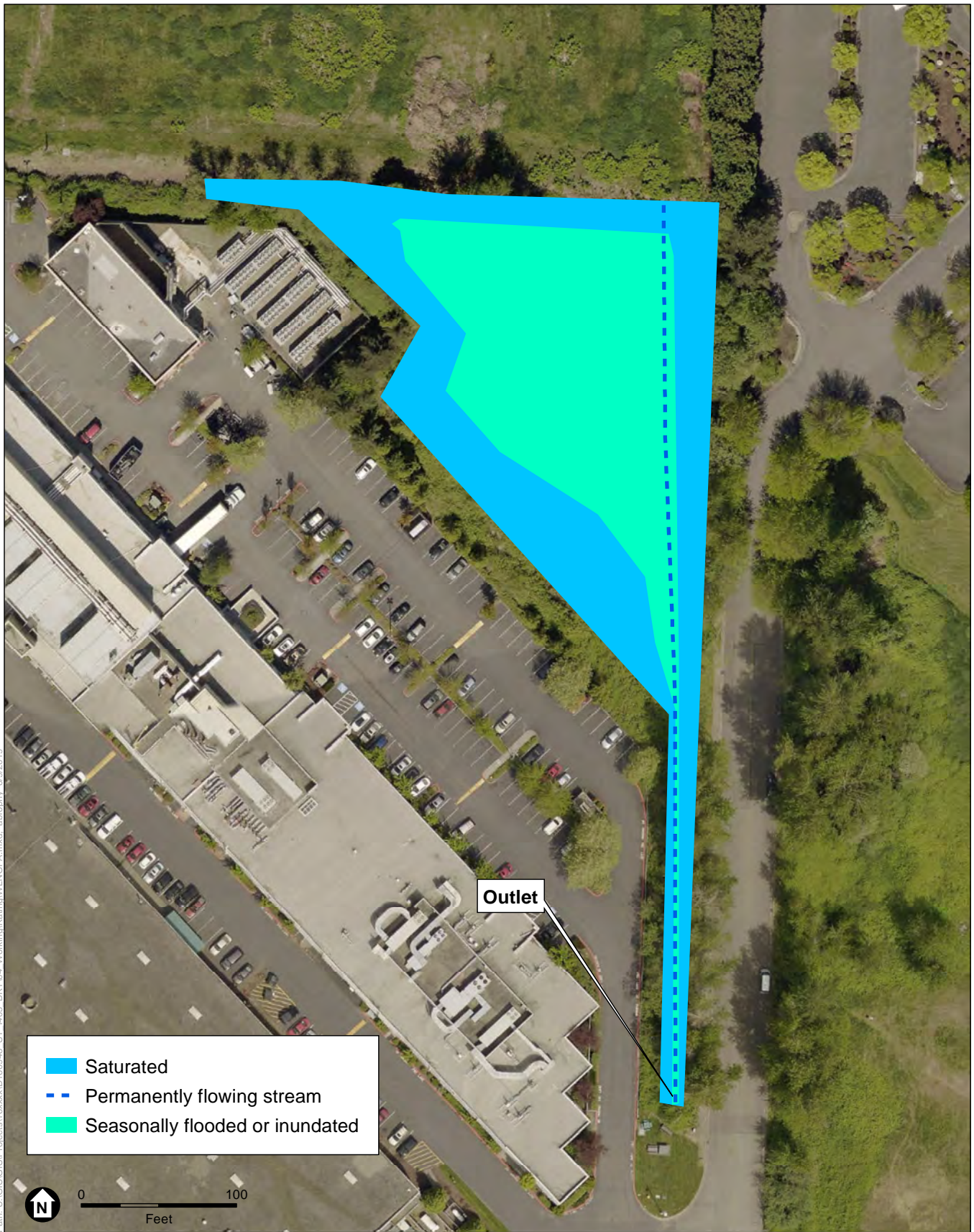
Screen capture of list of TMDLs for WRIA in which unit is found
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 88
 WBO-3 Cowardin plant classes and boundary of area within 150 feet
 Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

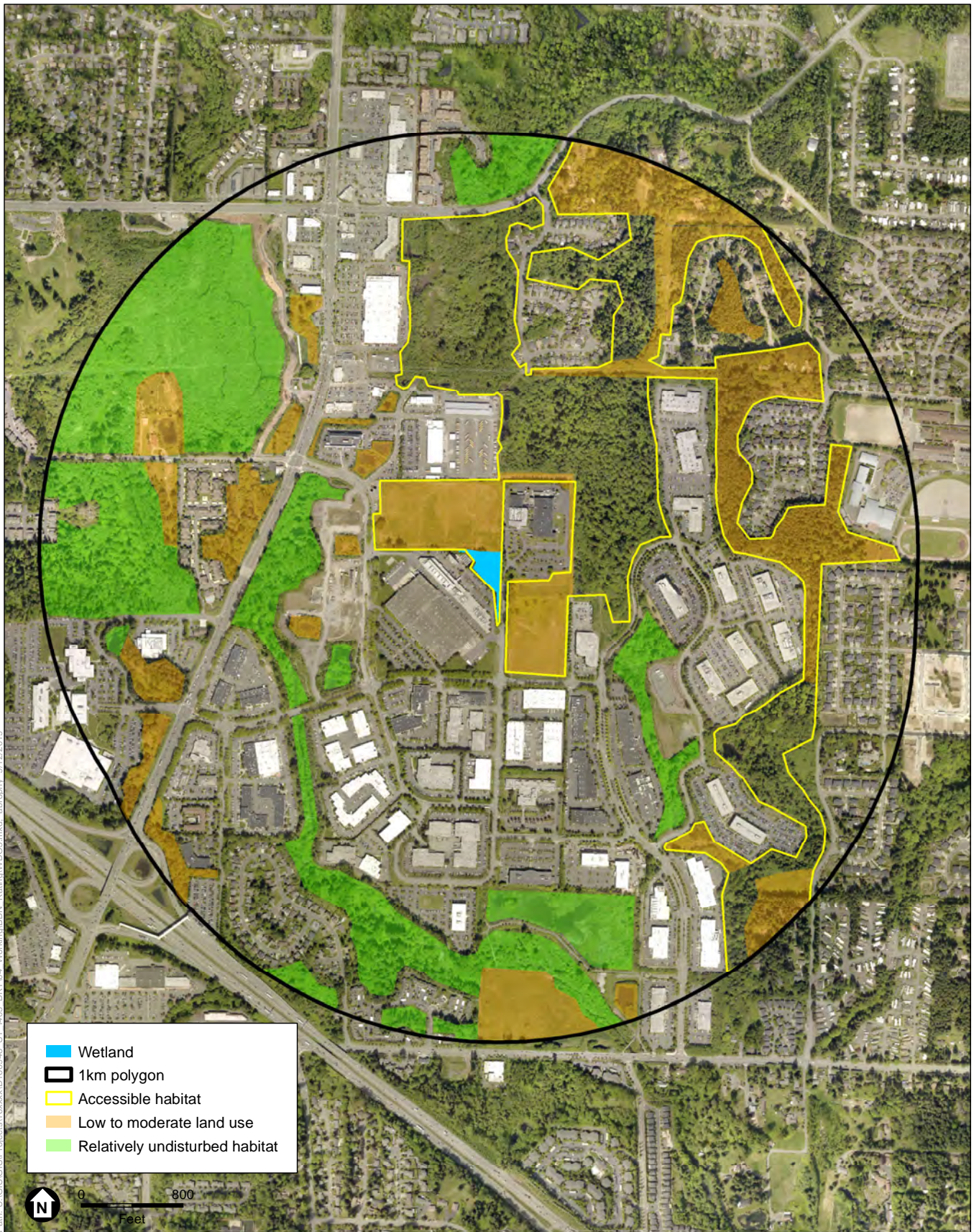
Figure 8
WBO-3 hydroperiods and location of outlet
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 9
WBO-3 contributing basin
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

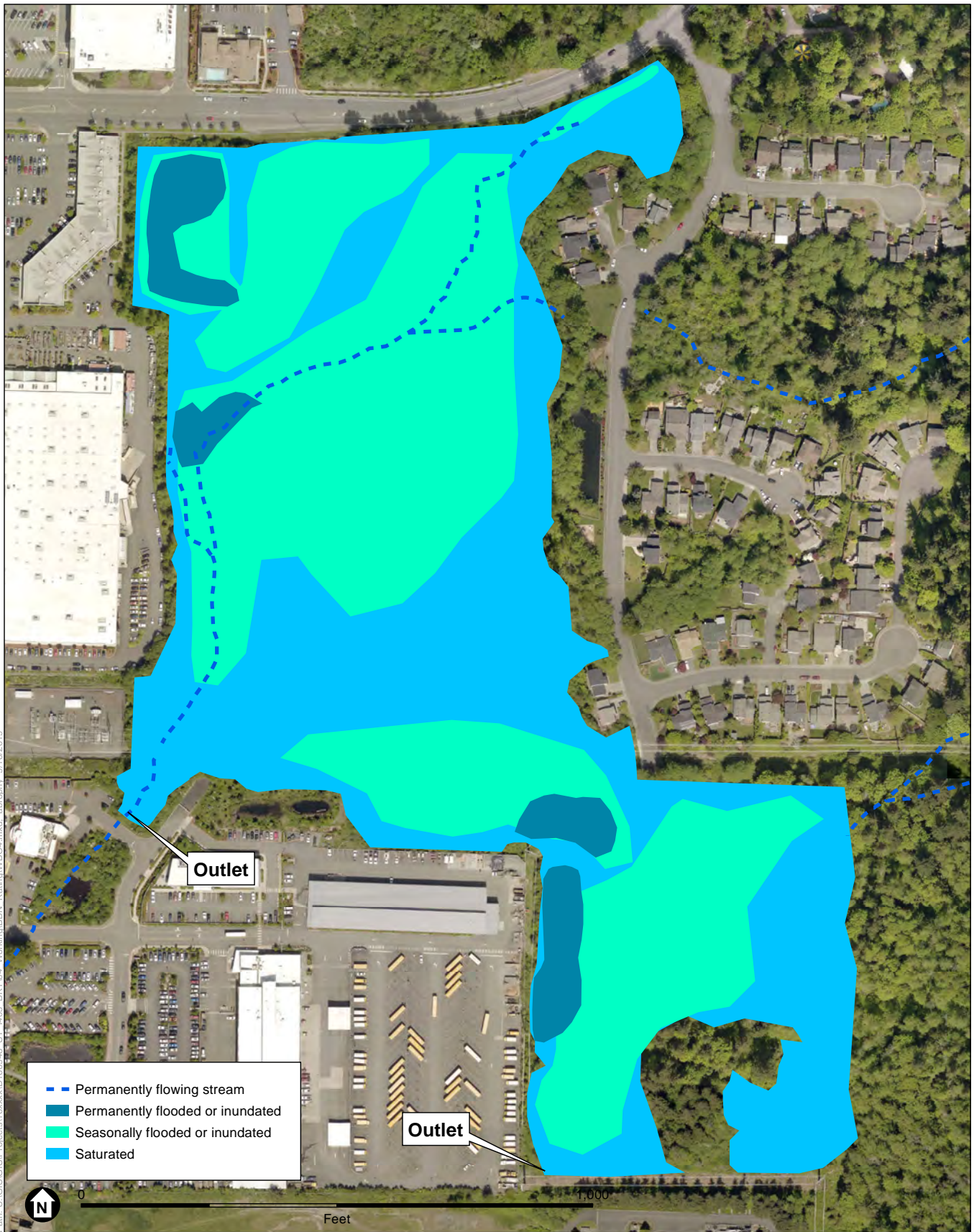
Figure 10
WBO-3 accessible and undisturbed habitat
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

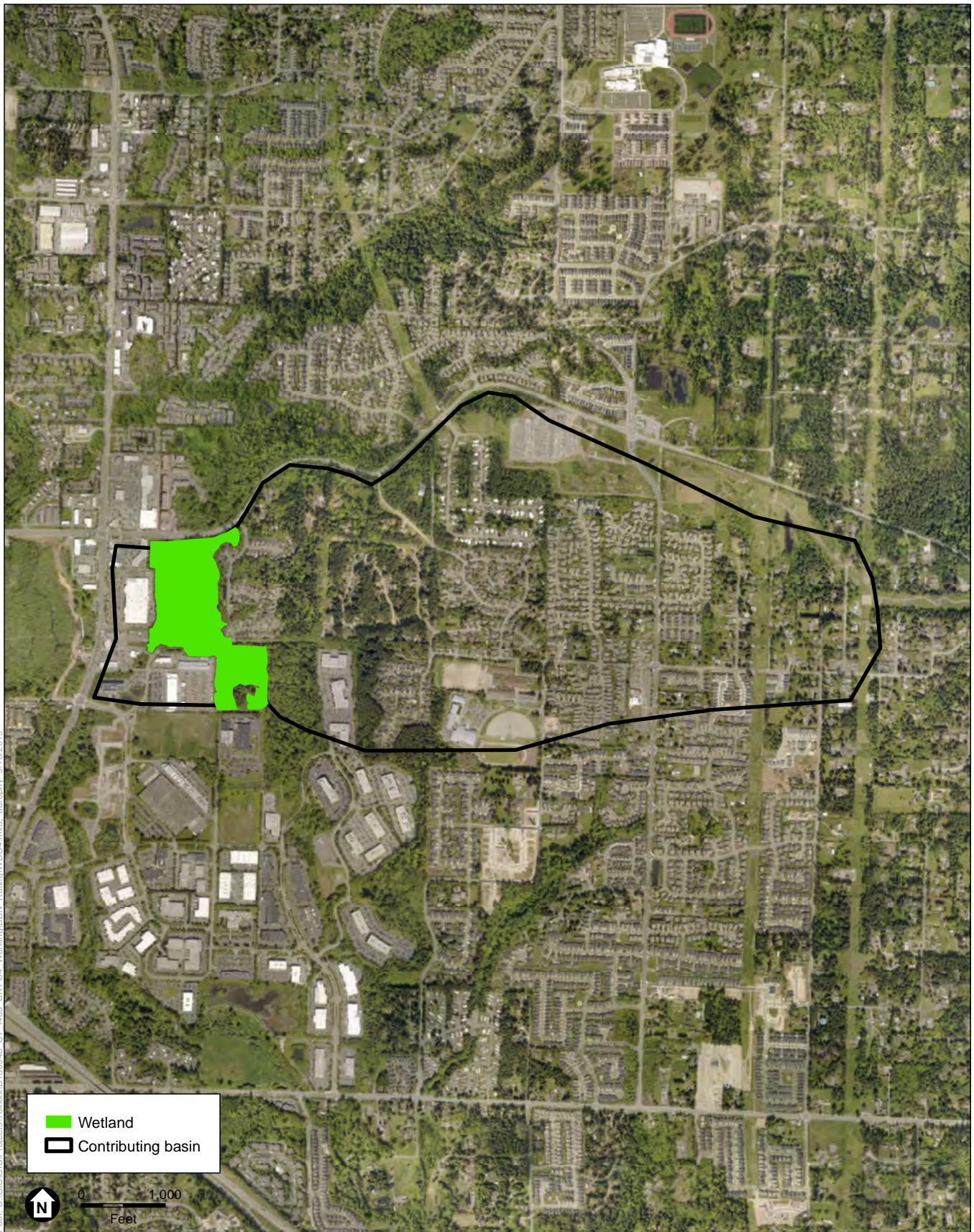
Figure 11
WBO-4 Cowardin plant classes and boundary of area within 150 feet
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 12
WBO-4 hydroperiods and location of outlets
Bothell, Washington

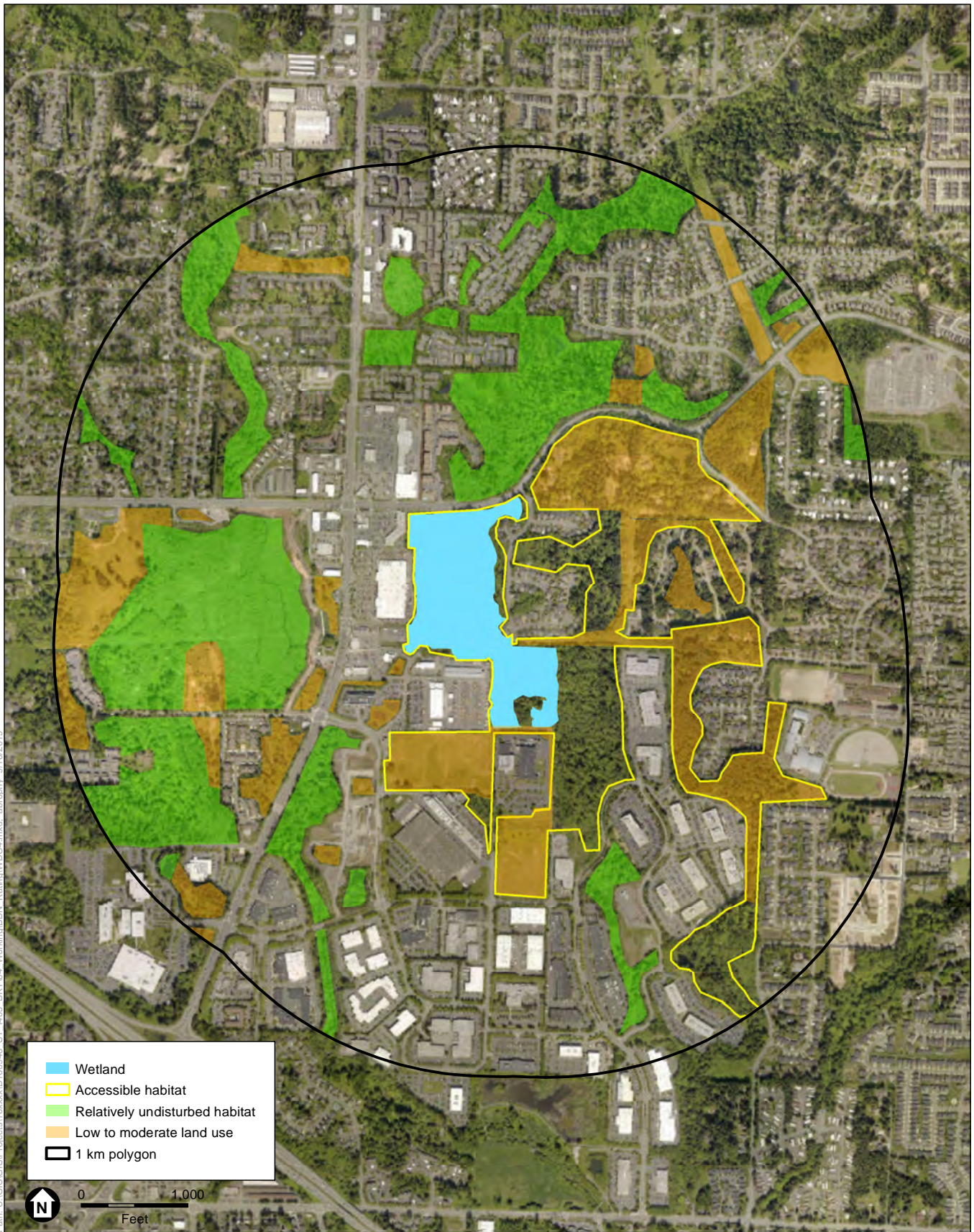


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SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 13
WBO-4 contributing basin
Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 14
WBO-4 accessible and undisturbed habitat
Bothell, Washington



Path: U:\GIS\Projects\16xxxx\16160948_ST_1405_BRT04_Working\BBN_Rainq\WBO5_6.mxd, abrophy, 9/16/2019

SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 15
WBO-5 and WBO-6 Cowardin plant classes and boundary of area within 150 feet of wetlands
Bothell, Washington

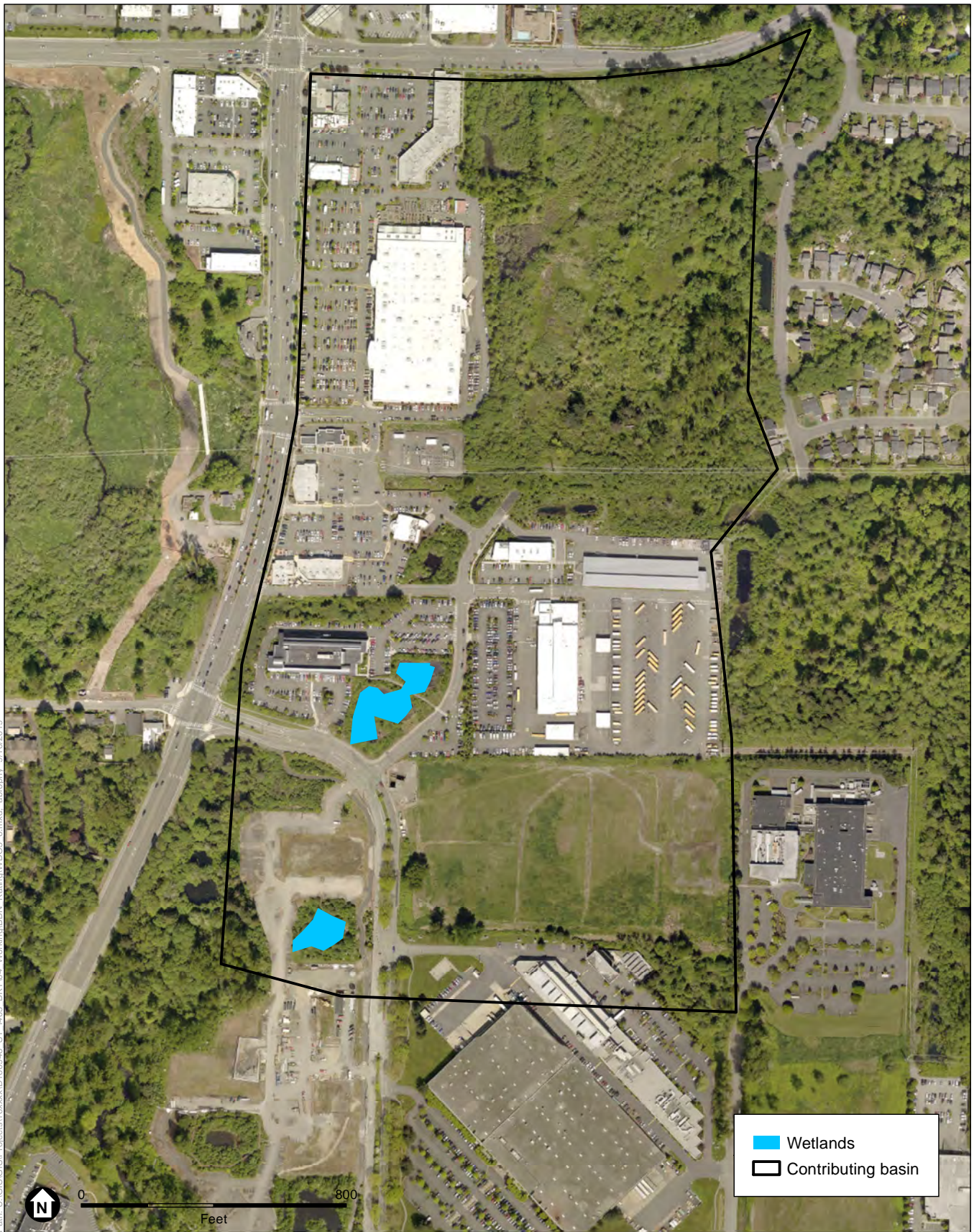




SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 16
WBO-5 and WBO-6 hydroperiods and location of outlets
Bothell, Washington



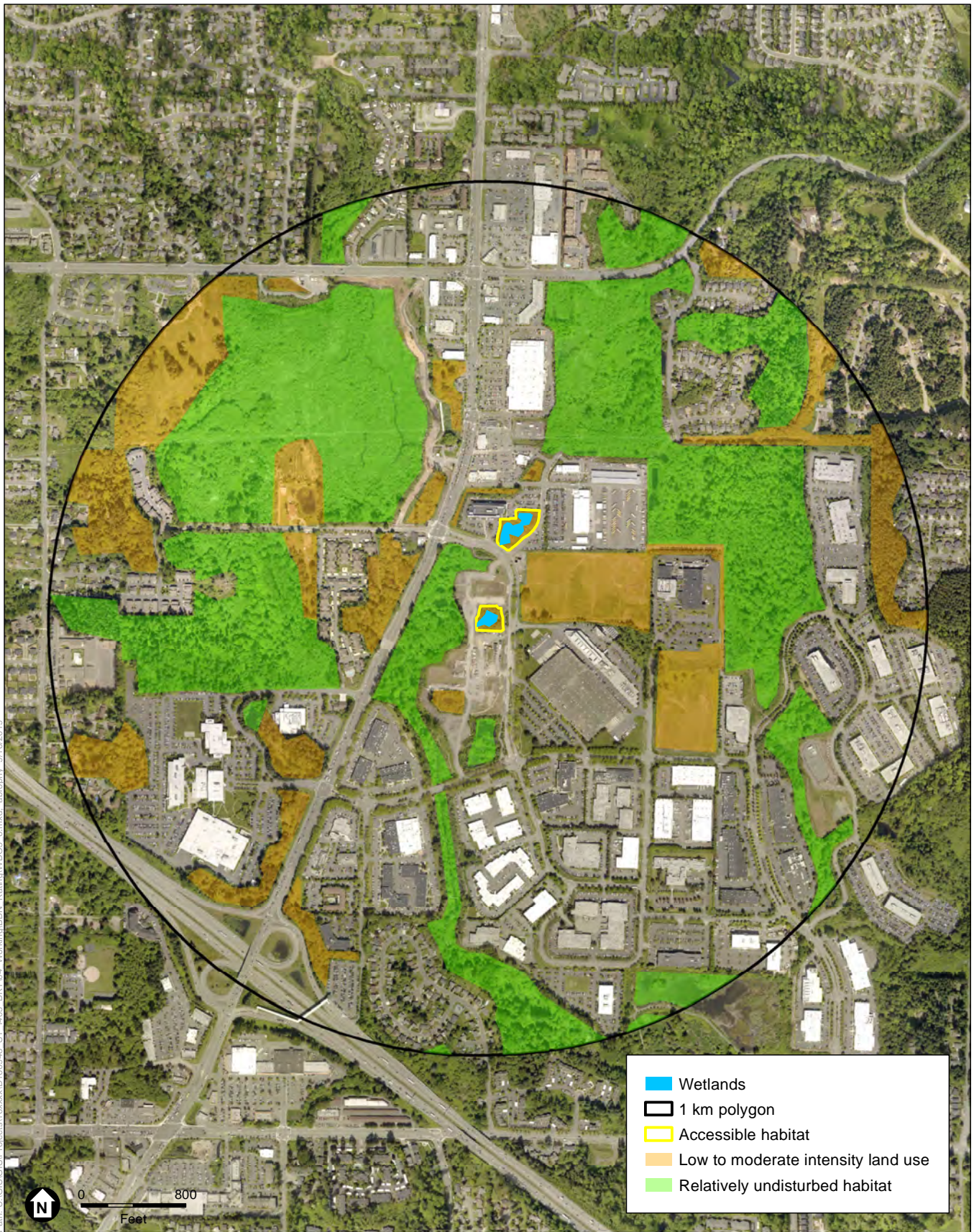
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SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 17
WBO-5 and WBO-6 contributing basin
Bothell, Washington





SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

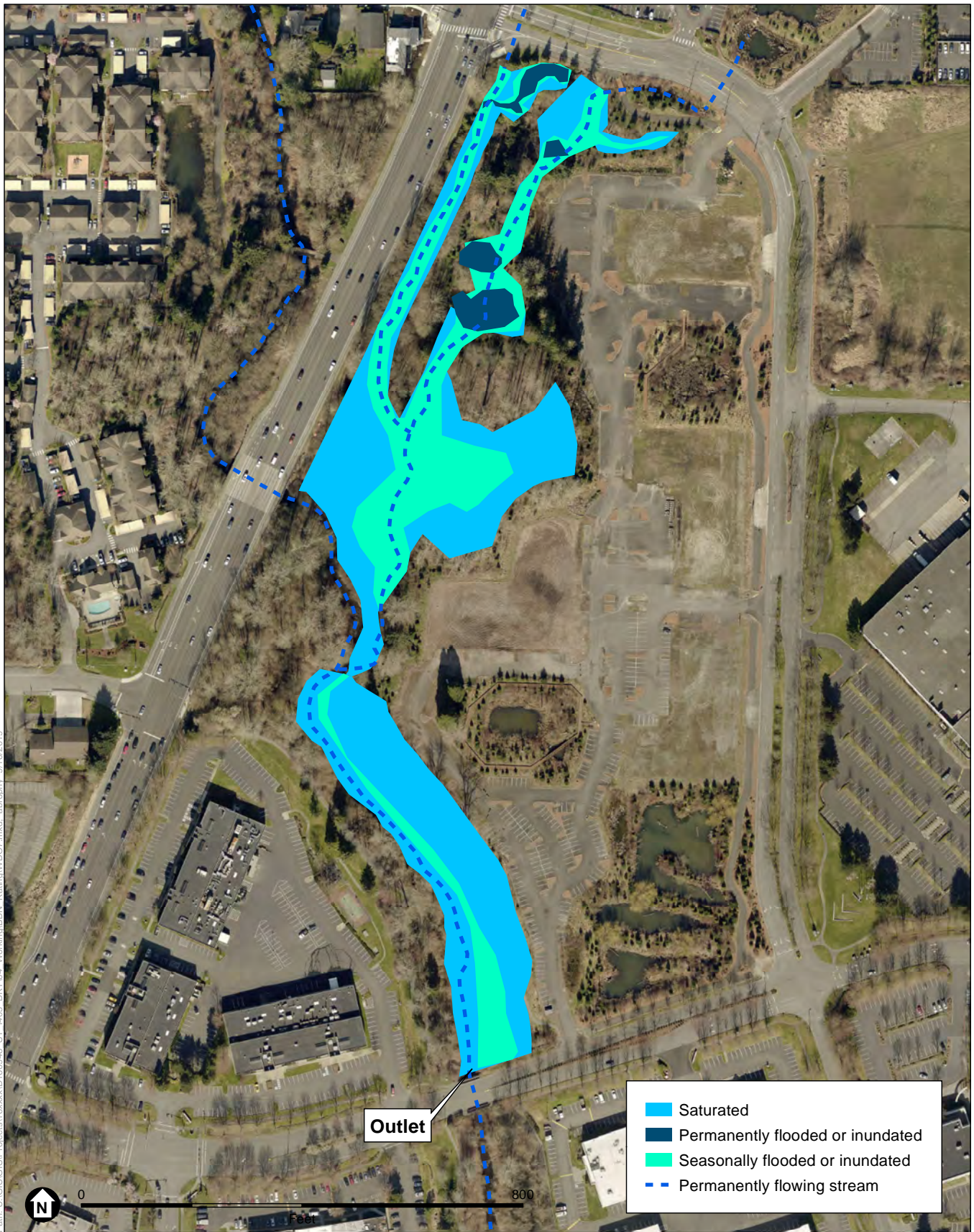
Figure 18
 WBO-5 and WBO-6 accessible and undisturbed habitat
 Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 19
 WBO-7 Cowardin plant classes and boundary of area within 150 feet of wetland
 Bothell, Washington



SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 20
WBO-7 hydroperiods and location of outlet
Bothell, Washington



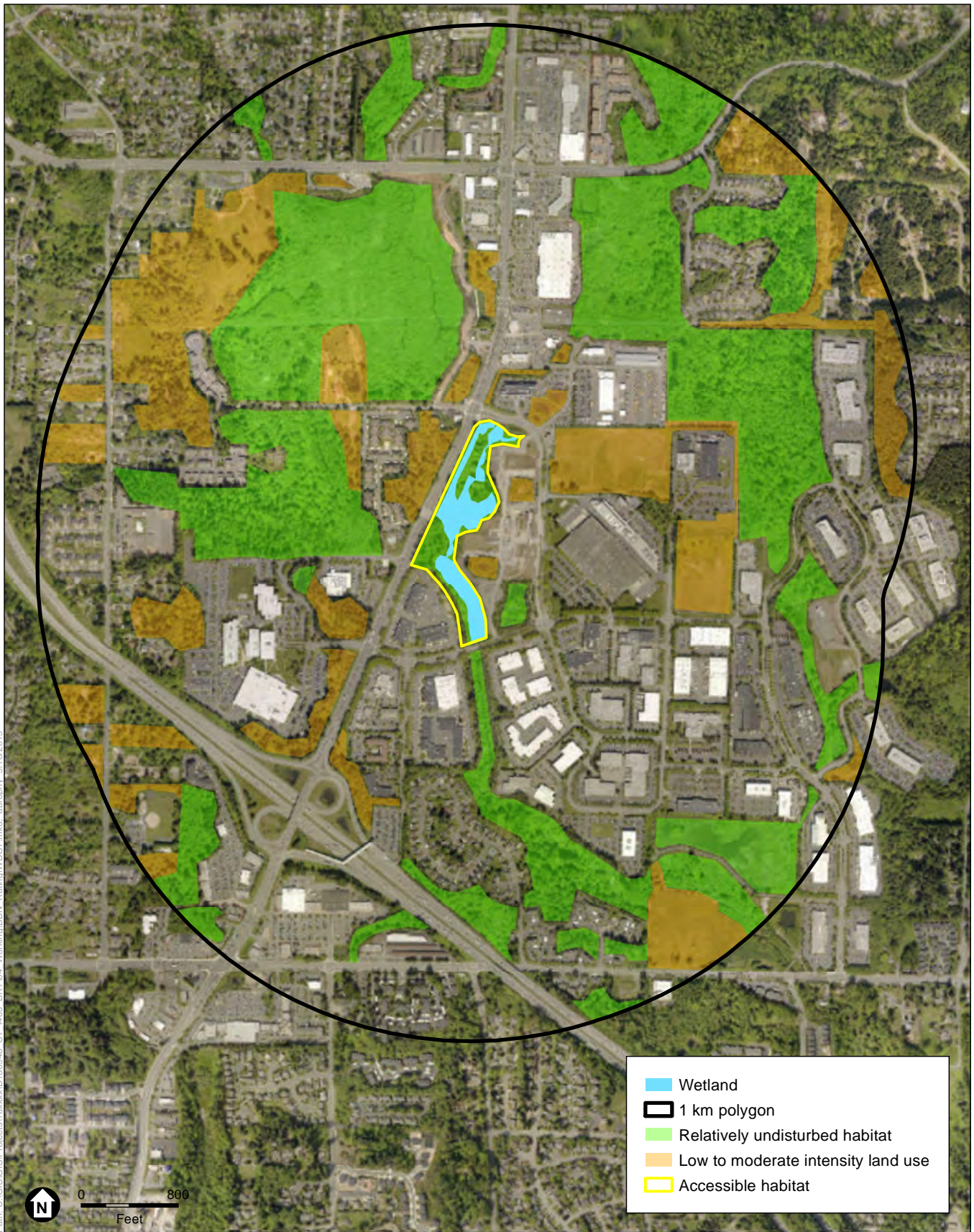
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SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 21
WBO-7 contributing basin
Bothell, Washington





SOURCE: ESA, 2019; King County, 2017

D160948 Sound Transit I-405 BRT Bus Base North

Figure 22
WBO-7 accessible and undisturbed habitat
Bothell, Washington

Appendix E

Wetland Functional Assessment Forms

Wetland Functions & Values Form

Wetland I.D. WBO-1 Project: ST I-405 BRT Bus Base North Project Assessed by: A. Brophy

Cowardin Class: PEM/PSS Ecology Category: III Local Rating: III Wetland size: 0.04 acres Date: 6/7/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is a depression with an intermittent outlet so it is able to retain storm flows from the adjacent road.	Y	Moderate function - The wetland is small with marks of ponding less than 6 inches so it is not able to contain large amounts of water.
Sediment Removal	X		Wetland is depressional, vegetated, and down slope of sediment sources from the road and field.	Y	Moderate function – Wetland retains sediment associated with surface flows. The wetland has low interspersion of vegetation and water and it ponds less than 6 inches. The wetland is small.
Nutrient & Toxicant Removal	X		Wetland is depressional, vegetated, and down slope of nutrient sources from the road and field.	Y	Moderate function – Water slows down and is held in the wetland. Ponding present during the growing season. Dese emergent vegetation to use the excess nutrients; however, the wetland is small.
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a watercourse or shoreline.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent and woody vegetation and is seasonally inundated during the growing season.	N	Low function – Wetland receives storm flows from the adjacent road. Species diversity is low but it has an intermittent outlet to export nutrients.
General Habitat Suitability	X		Wetland has two Cowardin classes and is not fragmented by development.	N	Low function – Wetland is adjacent to a road and some developed upland (commercial). Plant species diversity is low and dominated by weedy species. Provides habitat for passerines.
Habitat for Aquatic Invertebrates	X		Wetland has seasonal inundation and emergent vegetation is present in the ponded area.	Y	Low to moderate function – Associated with another nearby wetland with emergent vegetation in the ponded area. No LWD or aquatic bed vegetation is present.
Habitat for Amphibians	X		Wetland has seasonal ponding and emergent and woody vegetation, able to support egg masses, is present.	N	Low function – Emergent vegetation in ponded areas, but most not conducive to support amphibian egg masses. LWD not present. Buffer is disturbed and no amphibians were observed.
Habitat for Wetland-Associated Mammals		X	Permanent water is not present within the wetland.	N	

Habitat for Wetland-Associated Birds		X	Wetland does not have shallow open water or aquatic bed classes.	N	
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness	X		Wetland contains two Cowardin classes.	N	Low function – Dominated by non-native plant species and no matures trees are present.
Educational or Scientific Value		X	Wetland is in private ownership.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WBO-2Project: ST I-405 BRT Bus Base North ProjectAssessed by: A. BrophyCowardin Class: PEMEcology Category: IIILocal Rating: IIIWetland size: 0.04 acres Date: 6/7/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is a depression with a constricted outlet so it is able to retain storm flows from the adjacent road.	Y	Moderate function - The wetland is small with marks of ponding less than 6 inches so it is not able to contain large amounts of water.
Sediment Removal	X		Wetland is depressional, vegetated, and down slope of sediment sources from the road and field.	Y	Moderate function – Wetland retains sediment associated with surface flows. The wetland has low interspersions of vegetation and water and it ponds less than 6 inches. The wetland is small.
Nutrient & Toxicant Removal	X		Wetland is depressional, vegetated, and down slope of nutrient sources from the road and field.	Y	Moderate function – Water slows down and is held in the wetland. Ponding present during the growing season. Dense emergent vegetation to use the excess nutrients; however, the wetland is small.
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a watercourse or shoreline.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent and woody vegetation and is seasonally inundated during the growing season.	N	Low function – Wetland receives storm flows from the adjacent road. Species diversity is low but it has an intermittent outlet to export nutrients.
General Habitat Suitability	X		Wetland is not fragmented by development.	N	Low function – Wetland is adjacent to a road and some developed upland (commercial). Plant species diversity is low and dominated by weedy species. No evidence of wildlife use.
Habitat for Aquatic Invertebrates	X		Wetland has seasonal inundation and emergent vegetation is present in the ponded area.	Y	Low to moderate function – Associated with another nearby wetland with emergent vegetation in the ponded area. No LWD or aquatic bed vegetation is present.
Habitat for Amphibians	X		Wetland has seasonal ponding and emergent vegetation, able to support egg masses, is present.	N	Low function – Emergent vegetation in ponded areas, but most not conducive to support amphibian egg masses. LWD not present. Buffer is disturbed and no amphibians were observed.

Habitat for Wetland-Associated Mammals		X	Permanent water is not present within the wetland.	N	
Habitat for Wetland-Associated Birds		X	Wetland does not have shallow open water or aquatic bed classes.	N	
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness		X	Wetland does not contain two or more Cowardin classes, three or more strata of vegetation, or mature trees.	N	
Educational or Scientific Value		X	Wetland is in private ownership.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WBO-3Project: ST I-405 BRT Bus Base North ProjectAssessed by: A. BrophyCowardin Class: PSS/PFOEcology Category: IVLocal Rating: IVWetland size: 0.02 acres Date: 6/7/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is a depression with a intermittently flowing ditch so it is able to retain storm flows from the adjacent field and development.	Y	Low function - The wetland is small with marks of ponding less than 6 inches and an outlet so it is not able to contain large amounts of water.
Sediment Removal	X		Wetland is depression, vegetated, and down slope of sediment sources from the road and field.	Y	Low function – Wetland retains sediment associated with surface flows. The wetland has low interspersions of vegetation and water and it ponds less than 6 inches. The wetland is small.
Nutrient & Toxicant Removal	X		Wetland is depression, vegetated, and down slope of nutrient sources from the road and field.	Y	Low function – Water slows down and is held in the wetland. Ponding present during the growing season; however, the wetland is small.
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a watercourse or shoreline.	N	
Production of Organic Matter and its Export	X		Wetland contains woody vegetation and is seasonally inundated during the growing season.	N	Low function – Wetland receives storm flows from the field and adjacent development. Species diversity is low but it has an outlet to export nutrients.
General Habitat Suitability	X		Wetland has two Cowardin classes and is not fragmented by development.	N	Low function – Wetland is adjacent to a road and developed upland (commercial). Plant species diversity is low and dominated by weedy species. Provides habitat for passerines.
Habitat for Aquatic Invertebrates	X		Wetland has seasonal inundation and emergent vegetation is present in the ponded area.	Y	Low to moderate function – Associated with another nearby wetland with emergent vegetation in the ponded area. No LWD or aquatic bed vegetation is present.

Habitat for Amphibians	X		Wetland has seasonal ponding and emergent and woody vegetation, able to support egg masses, is present.	N	Low function – Emergent vegetation in ponded areas, but most not conducive to support amphibian egg masses. LWD not present. Buffer is disturbed and no amphibians were observed.
Habitat for Wetland-Associated Mammals		X	Permanent water is not present within the wetland.	N	
Habitat for Wetland-Associated Birds		X	Wetland does not have shallow open water or aquatic bed classes.	N	
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness	X		Wetland contains two Cowardin classes.	N	Low function – Dominated by non-native plant species; however, large native trees (willow and cottonwood) are present.
Educational or Scientific Value		X	Wetland is in private ownership.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WBO-4 Project: ST I-405 BRT Bus Base North Project Assessed by: A. Brophy

Cowardin Class: PAB/PEM/PSS/PFO Ecology Category: II Local Rating: II Wetland size: ~34 acres Date: 8/21/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is highly vegetated and depressional with a constricted outlet so it is able to retain storm flows. .	Y	Moderate to high function - The wetland is large so it is able to contain large amounts of water from the unnamed streams entering from the northeast and from surrounding development. The wetland also contains dense emergent and woody vegetation important for slowing flows and retaining floodwaters.
Sediment Removal	X		Wetland is depressional, vegetated, and down slope of sediment sources from the road and surrounding development.	Y	Moderate to high function – Wetland retains sediment associated with surface flows as it has dense emergent vegetation and a constricted outlet. Wetland is large.
Nutrient & Toxicant Removal	X		Wetland is depressional, vegetated, and down slope of nutrient sources from the road and surrounding development.	Y	Moderate to high function – Water slows down and is held in the wetland. Ponding present throughout the year. Dense emergent vegetation to use the excess nutrients.
Erosion Control & Shoreline Stabilization	X		Wetland is associated with unnamed streams and contains emergent and woody vegetation.	N	Low to moderate function – wetland is large and depressional areas likely hold back flood waters.
Production of Organic Matter and its Export	X		Wetland contains emergent and woody vegetation and portions are permanently inundated.	N	Low to moderate function – Wetland receives storm flows from the unnamed streams and surrounding development. Plant species diversity is moderate and wetland has interspersions of vegetation and water. Outlet constricts nutrient
General Habitat Suitability	X		Wetland has four Cowardin classes, connectivity with stream and upland forest corridors, and is not fragmented by development.	N	Moderate function – Wetland is adjacent to a road and developed upland (commercial and residential). Plant species diversity is moderate. Provides habitat for small mammals and passerines. Snags are present and LWD is likely present.

Habitat for Aquatic Invertebrates	X		Wetland has seasonal and permanent inundation and emergent vegetation is present in the ponded area.	Y	Moderate function –LWD is likely present and aquatic bed vegetation is present. Moist and wet soils present. Multiple plant strata present with complex interspersions of Cowardin classes.
Habitat for Amphibians	X		Wetland has seasonal and permanent ponding and emergent and woody vegetation, able to support egg masses, is present. Wetland is associated with a stream and receives flood waters. Wetland contains still and moving water.	Y	Moderate function – Emergent vegetation in ponded areas. LWD is likely present. Buffer is disturbed and no amphibians were observed.
Habitat for Wetland-Associated Mammals	X		It is unknown if the unnamed streams are permanently flowing. The northern stream is classified as “open” and the southern stream is typed as “intermittent”. Permanent ponded water is present within the wetland.	N	Low to moderate function– Interspersions of vegetation and water. Trees and shrubs present in wetland and buffer.
Habitat for Wetland-Associated Birds	X		Wetland has shallow open water and aquatic bed classes.	N	Moderate function – Wetland contains PAB/PEM/PSS/PFO habitat with a variety of hydrologic regimes. However, majority of surrounding land is developed. Snags are present.
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness	X		Wetland contains four Cowardin classes.	N	Low to moderate function – Dominated by non-native plant species and mature trees are present.
Educational or Scientific Value	X		The south portion of the wetland is in public ownership and the north portion is in private ownership.	N	Low function - The wetland is surrounded by private development and is inaccessible.
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WBO-5 Project: ST I-405 BRT Bus Base North Project Assessed by: A. Brophy

Cowardin Class: PEM/PSS Ecology Category: III Local Rating: III Wetland size: ~1 acre Date: 8/21/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is a depression with a slightly constricted outlet so it is able to retain flows from storm flows, water entering through the culvert on the north end of the wetland, and flooding.	Y	Moderate function – The wetland is depressional. Marks of ponding between 0.5 and 2 feet. However, the wetland is small compared to the drainage area and the outlet is only slightly constricted.
Sediment Removal	X		Wetland is depressional and down slope of sediment sources from the road and surrounding development.	Y	Moderate function – Wetland retains sediment associated with surface flows due to the dense vegetation and slightly constricted outlet. However, the wetland has low interspersion of vegetation. The wetland ponds between 0.5 and 2 feet.
Nutrient & Toxicant Removal	X		Wetland is depressional and receives nutrient sources from the road and surrounding development.	Y	Moderate function – Water slows down and is held in the wetland. Ponding present throughout the year. Herbaceous vegetation to use nutrients and toxicants. However, the wetland is relatively small.
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a watercourse or shoreline.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent and some woody vegetation and portions are permanently inundated.	N	Low to moderate function – Wetland receives storm flows from surrounding development. Plant species diversity is moderate. Outlet constricts nutrient export.
General Habitat Suitability	X		Wetland has two Cowardin classes and is not fragmented by development.	N	Low function – Wetland is adjacent to a road and developed upland (commercial) so it is isolated. Plant species diversity and interspersion are low. Provides habitat for passerines. Snags and LWD are present.
Habitat for Aquatic Invertebrates	X		Wetland has seasonal and permanent inundation and emergent vegetation is present surrounding the ponded areas.	N	Low function – Wetland has a variety of water depths but does not have aquatic bed vegetation and low amounts of LWD. Moist and wet soils present. Low interspersion of Cowardin classes.

Habitat for Amphibians	X		Wetland has seasonal ponding.	N	Low function – Buffer is disturbed. LWD is present.
Habitat for Wetland-Associated Mammals	X		Permanent ponded water is present within the wetland.	N	Low function– Low interspersions of vegetation and water. Shrubs present in wetland buffer.
Habitat for Wetland-Associated Birds	X		Wetland has shallow open water. Buffer contains dense shrub habitat.	N	Low to moderate function – Wetland contains PEM/PSS habitat with a variety of hydrologic regimes. However, majority of surrounding land is developed. Snags are present.
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness	X		Wetland contains two Cowardin classes and dominant shrubs are native.	N	Low function – Dominated by non-native plant species and contains no mature trees.
Educational or Scientific Value		X	Wetland is in private ownership.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WBO-6 Project: ST I-405 BRT Bus Base North Project Assessed by: A. Brophy

Cowardin Class: PEM/PSS Ecology Category: III Local Rating: III Wetland size: ~0.5 acres Date: 8/21/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is a depression with a slightly constricted outlet so it is able to retain flows from storm flows, water entering through the culvert on the north end of the wetland, and flooding.	Y	Moderate function – The wetland is depressional. Marks of ponding between 0.5 and 2 feet. However, the wetland is small compared to the drainage area and the outlet is only slightly constricted.
Sediment Removal	X		Wetland is depressional and down slope of sediment sources from the road and surrounding development.	Y	Moderate function – Wetland retains sediment associated with surface flows due to the dense vegetation and slightly constricted outlet. However, the wetland has low interspersions of vegetation. The wetland ponds between 0.5 and 2 feet.
Nutrient & Toxicant Removal	X		Wetland is depressional and receives nutrient sources from the road and surrounding development.	Y	Moderate function – Water slows down and is held in the wetland. Ponding present during the growing season. Herbaceous vegetation to use nutrients and toxicants. However, the wetland is relatively small.
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a watercourse or shoreline.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent and some woody vegetation and portions are permanently inundated.	N	Low to moderate function – Wetland receives storm flows from surrounding development. Plant species diversity is moderate. Outlet constricts nutrient export.
General Habitat Suitability	X		Wetland has two Cowardin classes and is not fragmented by development.	N	Low function – Wetland is adjacent to a road and developed upland (parking lot) so it is isolated. Plant species diversity and interspersions are low. Provides habitat for passerines.
Habitat for Aquatic Invertebrates	X		Wetland has seasonal inundation and emergent vegetation is present in ponded area.	N	Low function – Wetland has a variety of water depths but does not have aquatic bed vegetation and low amounts of LWD. Moist and wet soils present. Low interspersions of Cowardin classes.

Habitat for Amphibians	X		Wetland has seasonal ponding.	N	Low function – Buffer is disturbed. LWD is present.
Habitat for Wetland-Associated Mammals	X		Permanent ponded water is present within the wetland.	N	Low function– Low interspersions of vegetation and water. Shrubs present in wetland buffer.
Habitat for Wetland-Associated Birds	X		Wetland has shallow open water during the growing season. Buffer contains dense shrub habitat.	N	Low to moderate function – Wetland contains PEM/PSS habitat with a variety of hydrologic regimes. However, majority of surrounding land is developed. Snags are present.
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness	X		Wetland contains two Cowardin classes and dominant shrubs are native.	N	Low function – Dominated by non-native plant species and contains no mature trees.
Educational or Scientific Value		X	Wetland is in private ownership.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WBO-7 Project: ST I-405 BRT Bus Base North Project Assessed by: A. Brophy

Cowardin Class: PEM/PSS/PFO Ecology Category: II Local Rating: II Wetland size: ~10 acres Date: 8/21/2019

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is highly vegetated and depressional with a permanently flowing outlet. Able to retain flows and flooding from North Creek	Y	Moderate function – wetland is depressional with dense emergent and woody vegetation to slow flows and retain floodwaters. However, wetland is relatively small compared to the drainage area.
Sediment Removal	X		Wetland is depressional, vegetated, and down slope of sediment sources from the road and surrounding development.	Y	Moderate to high function – Wetland retains sediment associated with North creek and surface flows as it has dense emergent and woody vegetation. However, wetland has a permanently flowing outlet.
Nutrient & Toxicant Removal	X		Wetland is depressional, vegetated, and down slope of nutrient sources from the road and surrounding development.	Y	Moderate to high function – Water slows down and is held in the wetland. Ponding present throughout the year. Dense emergent vegetation to use the excess nutrients.
Erosion Control & Shoreline Stabilization	X		Wetland is associated with North Creek and contains emergent and woody vegetation.	N	Moderate function – wetland contains depressional areas likely hold back flood waters with dense vegetation.
Production of Organic Matter and its Export	X		Wetland contains dense emergent and woody vegetation, portions are permanently inundated, and it is associated with North Creek.	Y	Moderate to high function – Wetland receives flood waters. Plant species diversity is moderate and wetland has interspersions of vegetation and water. Permanently flowing outlet allows for nutrient export.
General Habitat Suitability	X		Wetland has three Cowardin classes and connectivity with stream and upland forest corridors.	N	Moderate function – Wetland is adjacent to a road and developed upland (parking lot). Plant species diversity is moderate. Provides habitat for small mammals and passerines. Snags are present and LWD is likely present.

Habitat for Aquatic Invertebrates	X		Wetland has seasonal and permanent inundation and emergent vegetation is present in the ponded areas.	N	Moderate function –LWD is likely present. Moist and wet soils present. Multiple plant strata present with complex interspersions of Cowardin classes.
Habitat for Amphibians	X		Wetland has seasonal and permanent ponding and emergent and woody vegetation, able to support egg masses, is present. Wetland is associated with North Creek and receives flood waters. Wetland contains still and moving water.	N	Moderate function – Emergent vegetation in ponded areas. LWD is likely present. Buffer is disturbed.
Habitat for Wetland-Associated Mammals	X		North Creek is permanently flowing. Ponded water is present within the wetland.	N	Low to moderate function– Interspersions of vegetation and water. Trees and shrubs present in wetland and buffer.
Habitat for Wetland-Associated Birds	X		Wetland has shallow open water during the growing season.	N	Low to moderate function – Wetland contains PEM/PSS/PFO habitat with a variety of hydrologic regimes. However, majority of surrounding land is developed. Snags are present and LWD is likely present. .
General Fish Habitat	X		Wetland is associated with a fish-bearing stream.	N	Low to moderate function – water depth in wetland is shallow. Buffer provides shade and detrital matter to support invertebrate food base.
Native Plant Richness	X		Wetland contains three Cowardin classes.	N	Low to moderate function – large amounts of non-native plant species and mature trees are present.
Educational or Scientific Value		X	Wetland is in private ownership.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Appendix F

Washington WETS Table

The method used for evaluating precipitation normality was described by Sprecher and Warne (2000). Precipitation percentiles for each month are calculated from an average of 30 years of precipitation data and published on NRCS WETS tables (NRCS 2019). Table 1 below shows the 30th and 70th percentiles for precipitation totals (calculated from the long term precipitation data) compared to the actual precipitation totals for January through March 2019. Precipitation is determined to have a “normal” condition if it falls within the 30th to 70th percentile range; if the recorded data is higher or lower than the range, then it is determined to have a “wet” or “dry” condition, respectively (NRCS 1997).

Normal precipitation is evaluated by multiplying the condition value by the weighted monthly value for three months (Table E-1). The condition is given a value: 1 for “dry”, 2 for “normal”, and 3 for “wet”. For each month, the condition value is then multiplied by the weighted monthly value. The most recent month (March in this case) receives the highest value (3) and for each previous month, the weighted value is decreased by one. The total of this product is then used to determine whether the three-month period is “drier than normal” (6-9), “normal” (10-14), or “wetter than normal” (15-18). Table 1 below shows the comparison between normal precipitation and 2019 precipitation for the region.

The evaluation of normal precipitation revealed that normal climatic conditions occurred over the 3 months prior to the April 8, 2019 field investigation (Table E-1).

Table E-1 Evaluation of normal precipitation for the 3-month period preceding field investigations

Prior Month	WETS 30% Change Less (inches)	WETS 30% Change More (inches)	2019 Measured Rainfall (inches)	2019 Condition: Dry, Wet, Normal	Condition Value	Month Weight Value	Evaluation of Normal Precipitation
January	3.81	5.80	2.87	Dry	1	1	Normal (10)
February	1.91	3.40	3.98	Wet	3	2	
March	2.71	4.11	1.60	Dry	1	3	

SOURCE: WETS Seattle Sand Point WFO, WA Station Data

References

- Natural Resources Conservation Service (NRCS). 1997. Hydrology Tools for Wetland Determination. Chapter 19, Engineering field handbook. D. E. Woodward, ed. USDA-NRCS, Fort Worth, TX.
- Natural Resources Conservation Service (NRCS). 2019. Agricultural Applied Climate Information System. US Department of Agriculture, Natural Resources Conservation Service. (Internet website: https://efotg.sc.egov.usda.gov/efotg_locator.aspx); accessed August 2019.
- Sprecher, S. and Warne, A. 2000. Accessing and Using Meteorological Data to Evaluate Wetland Hydrology. Technical Report TR-WRAP-00-01. US Army Corps of Engineers, Engineer Research and Development Center, Operations Division Regulatory Branch, Vicksburg, Mississippi. April.



