Ecosystem Resources and Wetland Delineation Technical Memorandum

September 2020

SoundTransit

Consultant Quality Control Form

Version	Title	Date	Originator/ Drafted by	Reviewed by	Approved by	Notes, as required
0	Ecosystems and Wetlands Delineation Technical Memorandum	1/24/2020	Environmental Science Associates	Larissa King Rawlins (Task Lead) Ed Reynolds (technical edit)	Chris Wellander (Project Manager)	First draft for ST review
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5	Ecosystems and Wetlands Delineation Technical Memorandum	9/11/2020	Environmental Science Associates	Larissa King Rawlins (Task Lead) Ed Reynolds (technical edit) Sandi Wise (QC)	Chris Wellander (Project Manager)	Final review and revisions before publishing

Summary

As identified in the *Sound Transit 3 (ST3) System Plan* (Sound Transit 2016), Sound Transit is planning for bus rapid transit (BRT) service within the I-405 corridor for 37 miles between the Cities of Lynnwood and Burien. Project development will involve planning and preliminary design of BRT elements, including defining route alignment, operations, and transit priority treatments; 11 BRT stations; and park-and-ride facilities. The purpose of this *Ecosystem 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 trees regulated by local, state, and federal agencies within the study areas.

The study areas for this analysis include where permanent or temporary impacts may occur to ecosystem resources and regulated trees within the project components. A desktop analysis of the mapped ecosystem resources within 500 feet of each project component is included in this report to gain additional context of the landscape. Field investigations were conducted by the Washington State Department of Transportation for the Brickyard Station and Roadway Improvements project component, which are summarized in this report. Field investigations were conducted by Sound Transit in areas of known impacts within the designated study areas of the following project components:

- Burien Transit Center and Roadway Improvements
- Tukwila International Boulevard BRT Station and Roadway Improvements
- South Renton Transit Center and Roadway Improvements
- Bellevue Transit Center and Off-site Layover
- Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage
- Lynnwood City Center Transit Station BRT and Roadway Improvements

Wetlands and streams were only observed or mapped as occurring within two project components: the Tukwila International Boulevard BRT Station and Roadway Improvements and the Brickyard Station and Roadway Improvements. Within the Tukwila International Boulevard BRT Station and Roadway Improvements study area, four wetlands and two unnamed tributary streams to Gilliam Creek were identified and their boundaries were estimated.

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Acronyms and Abbreviations

BAT	business access and transit
BFW	bankfull width
BMC	Burien Municipal Code
BMP	best management practice
BOMC	Bothell Municipal Code
BRT	bus rapid transit
CAO	Critical Areas Ordinance
Corps	U.S. Army Corps of Engineers
dbh	diameter at breast height
DCE	Documented Categorical Exclusion
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
ETL	express toll lane
FWHCA	Fish and Wildlife Habitats Conservation Areas
GIS	geographic information system
GPS	global positioning system
I-405	Interstate 405
KZC	Kirkland Zoning Code
LMC	Lynnwood Municipal Code
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
PEM	palustrine emergent
PFO	palustrine forested
PHS	Priority Habitats and Species
PSS	palustrine scrub-shrub
RCW	Revised Code of Washington
SEPA	State Environmental Policy Act
SR	State Route
ST3	Sound Transit 3 Plan
SWPPP	Stormwater Pollution Prevention Plan
TESC Plan	Temporary Erosion and Sediment Control Plan
TMC	Tukwila Municipal Code
TSP	transit signal priority
TVM	ticket vending machine
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 Overview

The I-405 Bus Rapid Transit (BRT) Project would provide BRT service, primarily operating in managed and bus-only lanes within the I-405 and State Route (SR) 518 corridors for 37 miles between Lynnwood and Burien. The project alignment as well as proposed transit stations and park-and-ride garages are shown in **Figure 1-1**. The new BRT service is planned to operate as two high-capacity transit lines, inter-connecting at the Bellevue Transit Center near the future Bellevue Downtown Link light rail station. The north BRT line would operate between the Bellevue Transit Center and the Lynnwood City Center transit center, and the south BRT line would operate between the Bellevue Transit Center and the Burien Transit Center. Together, the I-405 BRT lines (north and south) would serve 11 stations, including one new transit center in Renton and one new park-and-ride garage in Kirkland. In addition, a park-and-ride lot would be constructed to increase park-and-ride capacity in the I-405 corridor (NE 44th Street, Renton).

In large part, the project would operate in express toll lanes (ETLs) along I-405, including segments of existing ETLs and segments of ETLs that the Washington State Department of Transportation (WSDOT) will construct between Bellevue and Tukwila (WSDOT 2018) and between the Canyon Park and Brickyard stations. Along SR 518, the project would operate primarily in general-purpose lanes, with bus-only lanes approaching and leaving the BRT station. Buses would move along local arterial roads to access transit facilities in Burien, Renton, Bellevue, and Lynnwood. It should be noted that WSDOT, in partnership with Sound Transit, has completed the environmental analysis, including evaluation of ecosystem resources and wetland impacts, for:

- NE 44th Street Station and Park-and- Ride
- NE 85th Street Station
- SR 522/I-405 Transit Hub
- Canyon Park Station

This document does not provide any additional information about these four locations.

Figure 1-1 shows all BRT project components, including those with environmental analysis completed by WSDOT, for reference. Sound Transit is completing environmental analysis for the following project components, which are discussed in this memorandum:

- Burien Transit Center and Roadway Improvements
- Tukwila International Boulevard BRT Station and Roadway Improvements
- South Renton Transit Center and Roadway Improvements
- Bellevue Transit Center and Off-site Layover
- Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage
- Brickyard Station and Roadway Improvements
- Lynnwood City Center Transit Station BRT and Roadway Improvements

SOURCE: Sound Transit 2020

Figure 1-1 I-405 Bus Rapid Transit Project

1.2 Purpose of technical memorandum

This Ecosystem Resources and Wetland Delineation Technical Memorandum was prepared to support the State Environmental Policy Act (SEPA) checklist for the proposed I-405 BRT Project. This report focuses on critical areas related to ecosystem resources, specifically wetlands, streams, and protected habitat. Fieldwork was limited to the identification of wetlands, streams, and regulated trees within each of the project component areas.

2 PROJECT DESCRIPTION

The following provides a description of the I-405 BRT operations and project components for which Sound Transit is completing the environmental analysis.

2.1 I-405 BRT operations

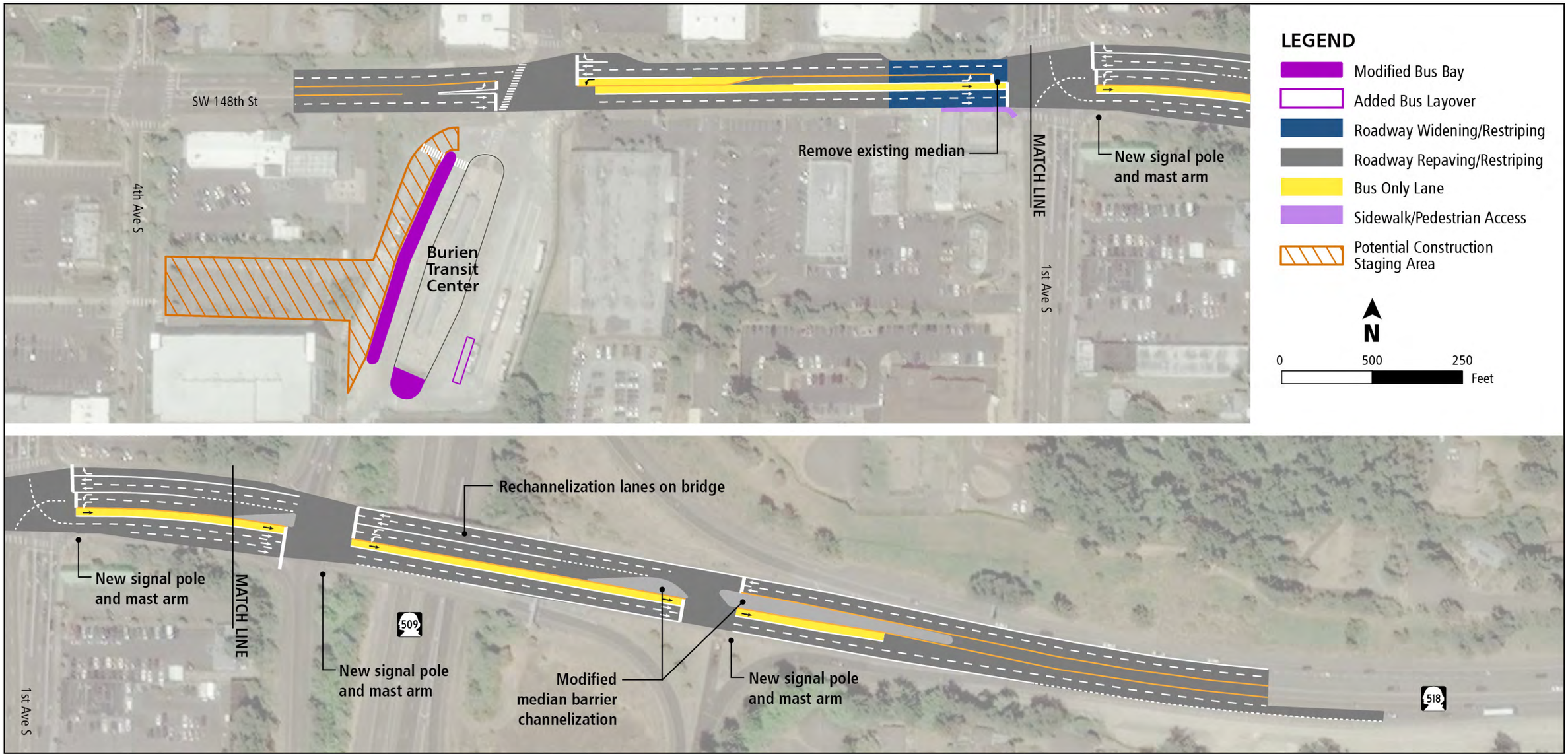
The new BRT service is planned to operate as two high-capacity transit lines, inter-connecting at the Bellevue Transit Center near the future Bellevue Downtown Link light rail station. The north BRT line would operate between the Bellevue Transit Center and the Lynnwood City Center transit center, and the south BRT line would operate between the Bellevue Transit Center and the Burien Transit Center. BRT service would have 10-minute headways during peak periods and 15-minute headways the remainder of the day and on weekends. Assuming a similar pattern to the Sound Transit Express and Sound Transit service standards, peak periods would be from 6 a.m. to 9 a.m. and from 3 p.m. to 6 p.m. on weekdays. During peak periods when travel time has more variation, the level of bus service could vary to maintain 10-minute headway service. The span of service would be 19 hours on weekdays and Saturday and up to 17 hours on Sundays.

2.2 Project components

All project components would include a proposed BRT-branded (Stride) uniquely identifiable pylon (decorative column) at the transit station to alert BRT riders to the service access point. The pylon may be internally illuminated to be identifiable in the evening and during hours of less light. In addition, all project components would likely include ticket vending machines (TVMs), security cameras and real-time bus information signs at stations for passengers. These features are considered to be standard elements for all project components.

2.2.1 Burien Transit Center and Roadway Improvements

Figure 2-1 provides a graphic representation of the proposed Burien Transit Center and associated roadway improvements.



SOURCE: Sound Transit 2020

Figure 2-1 Burien Transit Center and Roadway Improvements

To access the Burien Transit Center, westbound vehicles would turn left into the existing transit center driveway access, circulate south around the main transit center island and then west to the west transit center island. Within the Burien Transit Center, the existing main transit center island would be extended approximately 20 feet south to provide additional bus bay capacity; the height of this transit center island would remain at 6 inches. The west transit center island would be reconstructed to provide 9-inch-high platforms and would be lengthened to the south approximately 60 feet and to the north approximately 50 feet; the northern portion would also be shifted slightly to be angled to the east. The BRT service would use the northern portion of the west transit center island. The station would include a BRT-branded shelter and benches, in addition to the amenities at all project component stations.

New crosswalks may be added at the northern end of the west transit center island, one connecting the pedestrian path from the sidewalk on SW 148th Street to the west transit center island and a second extending east to connect to the main transit center island. The BRT vehicles would use the layover area in the Burien Transit Center. This project component may add one layover space to the southwest portion of the existing layover area. To exit the Burien Transit Center, BRT vehicles would circulate around the transit center islands to the existing driveway access and then turn right to travel eastbound on SW 148th Street.

To improve transit speed and reliability, a bus-only lane would be added east of the transit center entrance for eastbound buses along SW 148th Street that would extend east across the SR 509/SR 518 interchange and along SR 518 for approximately 400 feet. For westbound buses, a new bus-only left-turn pocket would be added beginning approximately 240 feet east of the transit center driveway access. Between 1st Avenue S and the Burien Transit Center, the bus-only lane and the bus-only left-turn pocket on SW 148th Street would be accommodated by converting the center two-way turn lane and, in the southeast section, slightly widening the existing roadway. Between the Burien Transit Center and 1st Avenue S, driveways would become right-in/right-out only. To accommodate the eastbound bus-only lane on the SR 518 bridge over SR 509, the existing lane striping would be rechannelized. Transit signal priority (TSP) would be added to the existing traffic signals at the intersection of SW 148th Street and 1st Avenue S, at the intersection of SW 148th Street and the SR 509 southbound on- and off-ramps, and at the intersection of SR 518.

2.2.1.1 Utilities and connections

Anticipated utilities needed to serve the BRT station include electric power, communications, and possibly water, which would be connected to utilities currently available in the transit center site or within SW 148th Street.

For this project component, all stormwater would be collected underground and detention would be provided as required. For the Burien Transit Center, flow control and water quality treatment would meet the requirements of the *King County Surface Water Design Manual* (King County 2016) and agreements between the King County Metro Transit Division, the property owner, and the City of Burien Public Works Department. Roadway modifications to SW 148th Street would comply with City of Burien requirements, which follow the *King County Surface Water Design Manual*, for flow control and water quality treatment. Stormwater facilities would ultimately tie into the existing conveyance systems. For the roadway modifications along SR 518, stormwater would meet the requirements of WSDOT's *Highway Runoff Manual* (WSDOT 2019a) for flow control and water quality treatment. Stormwater facilities also would ultimately tie into the existing conveyance systems.

2.2.1.2 Site work

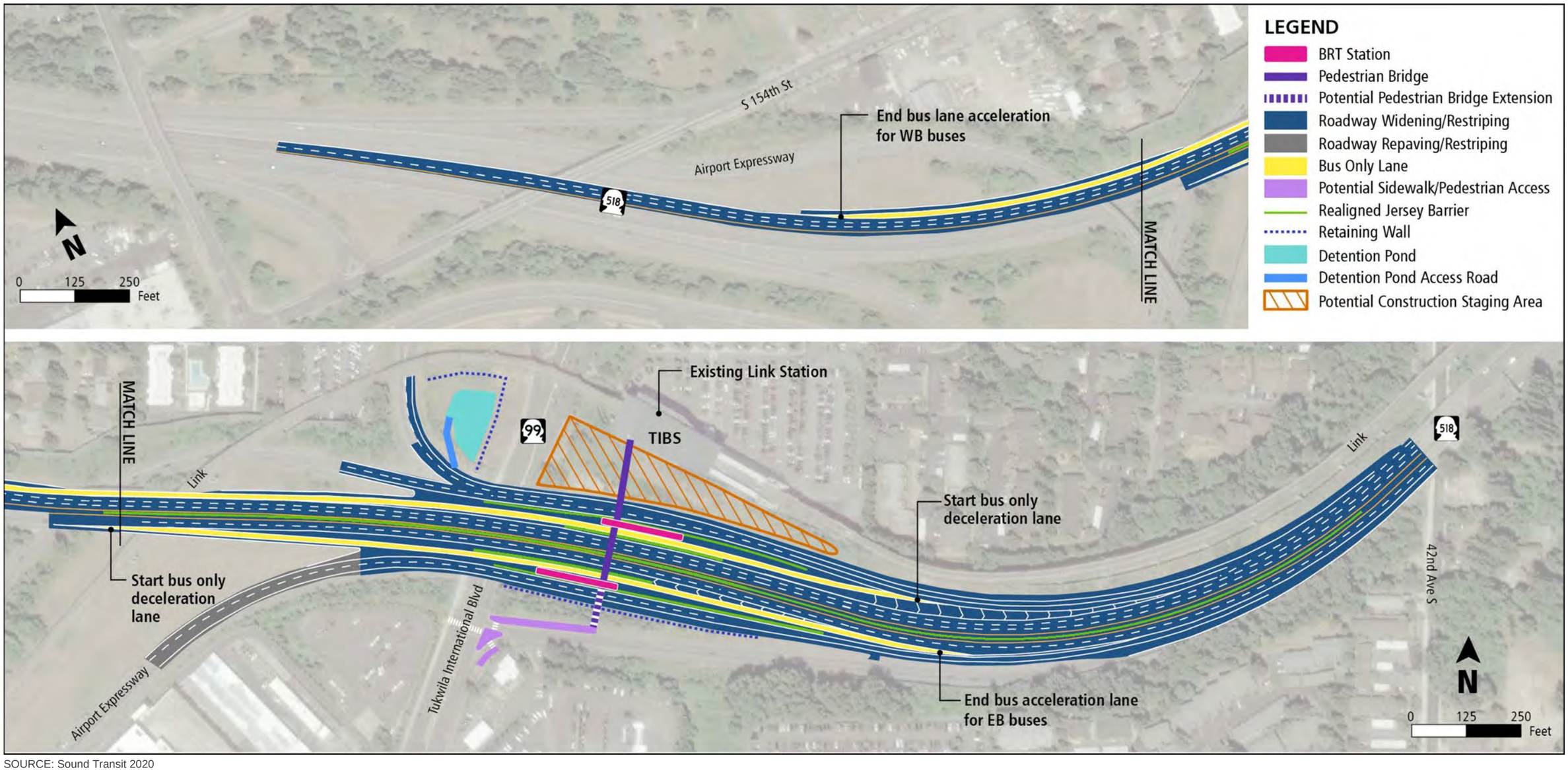
It is anticipated that the contractor would stage the necessary construction equipment and materials within the Burien Transit Center, including potentially using adjacent parking areas also owned by King County Metro.

2.2.2 Tukwila International Boulevard BRT Station and Roadway Improvements

Figure 2-2 provides a graphic representation of the proposed Tukwila International Boulevard BRT Station, the new pedestrian bridge, and associated roadway improvements. The proposed BRT station would be accessed by a new pedestrian bridge that would be constructed from the mezzanine level of the Tukwila International Boulevard Link light rail station and extended south across SR 518, connecting to the eastbound and westbound BRT station platforms. The walking surface of the pedestrian bridge would be level with the mezzanine floor level of the Link station and roughly level with the existing Tukwila International Boulevard bridge over SR 518. From the pedestrian bridge, access down to each BRT station platform would be provided by stairs and an elevator. The pedestrian bridge is also anticipated to extend to the south and connect at grade to an existing sidewalk on the eastbound on-ramp to SR 518 that connects to sidewalks on Tukwila International Boulevard.

The proposed BRT station (eastbound and westbound station platforms) would be located at-grade within the SR 518 right-of-way in an existing area between the SR 518 travel lanes and the on- and off-ramps to SR 518. In addition to the standard elements, the BRT station would include a branded shelter, benches, and raised platforms (approximately 9 inches) for level or near-level passenger boarding. Approaching both the east and westbound BRT station platforms, bus-only lanes would be added (for a total length of approximately 1,900 feet eastbound and 2,800 feet westbound) to allow BRT vehicles to safely decelerate to pick up/drop off at the station platform and accelerate from the station platforms and merge back onto SR 518 with general-purpose traffic. The addition of these bus-only lanes would require realigning the center jersey barrier, regrading, and repaving a portion of the existing SR 518 travel lanes and ramps to and from the interchange of SR 518 with Tukwila International Boulevard. In the westbound direction, the bus-only lane would also require widening the existing westbound SR 518 bridge that passes over the SR 518 off-ramp heading south to Airport Expressway.

A new retaining wall for fill would be constructed along the west side of the eastbound bus-only deceleration lane for approximately 900 feet, with a maximum height of 6 feet. On the south side of SR 518, adjacent to eastbound SR 518, there would be a new retaining wall for a length of approximately 730 feet, with a maximum height between 10 and 15 feet.



SOURCE: Sound Transit 2020

Figure 2-2 Tukwila International Boulevard BRT Station and Roadway Improvements

2.2.2.1 Utilities and connections

Anticipated utilities needed to serve the BRT station include electric power, communications, and possibly water, which would be connected to utilities currently available in or near SR 518 right-of-way.

Additionally, a stormwater detention facility would be constructed inside the westbound SR 518 off-ramp loop. The detention pond would include an adjacent retaining wall with a maximum height of 11 feet. Stormwater would be collected underground and detention would be provided as required. Flow control and water quality treatment would be provided as required by WSDOT's *Highway Runoff Manual* (WSDOT 2019a), and stormwater facilities would ultimately tie into the existing conveyance systems.

2.2.2.2 Site work

During construction, dewatering is anticipated near the Tukwila International Boulevard BRT Station area for construction of new retaining walls.

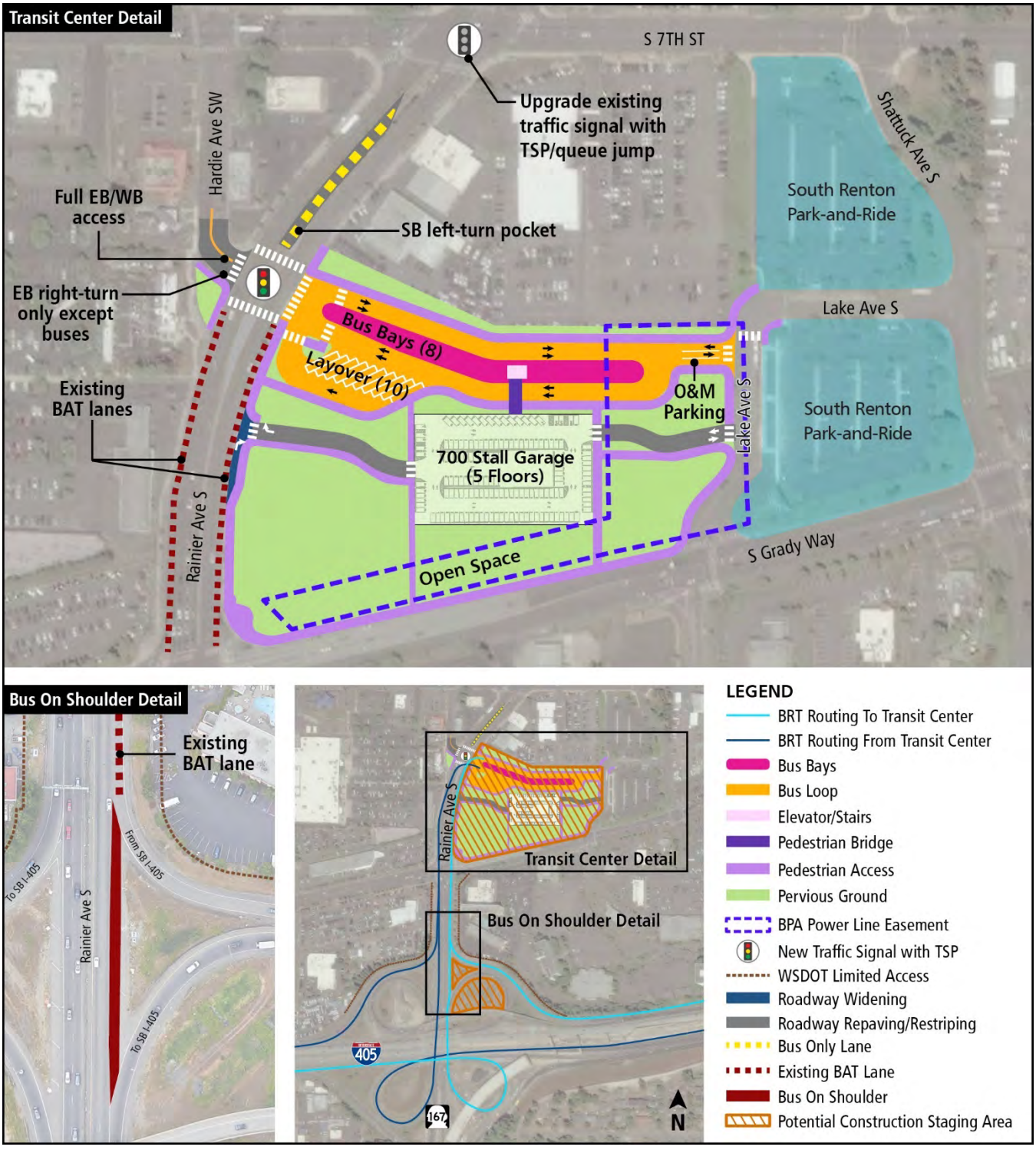
For this project component, the contractor would be expected to stage the necessary construction equipment and materials within the existing right-of-way for SR 518, likely in the area between westbound SR 518 and the existing Tukwila International Boulevard Link light rail station, outside of the active travel lanes and the on- and off-ramps.

2.2.3 South Renton Transit Center and Roadway Improvements

Figure 2-3 provides a graphic representation of the proposed South Renton Transit Center and Roadway Improvements.

The South Renton Transit Center would be located on the north side of I-405, in the northeast corner of the intersection of S Grady Way and Rainier Avenue S. This new transit facility would be developed on an 8.3-acre site. Facilities at the South Renton Transit Center would include the following:

- A new transit center island with eight 120-foot active bus bays with operational space provided for both BRT and other bus transit service (operated by King County Metro, with the assumption that they will use 6 active bays) using this facility. In addition to the standard elements, the BRT station in the transit center island could include a branded BRT shelter (if the entire transit center island is covered by a single, large shelter there would only be the pylon) and 9-inch raised platforms for near-level passenger boarding.
- Ten bus layover bays in the bus loop area.
- A 700-stall, 5-floor park-and-ride garage with drop-off and pick-up stalls on the first floor. Access to the park-and-ride garage would be from a separate right-turn-only entrance and exit from Rainier Avenue S, located south of the access to the transit center bus loop. A second access to the park-and-ride garage would be from Lake Avenue S; this access would not be restricted to right-in/right-out turns.



SOURCE: Sound Transit 2020

Figure 2-3 South Renton Transit Center and Roadway Improvements

- From the third floor of the park-and-ride garage, a pedestrian bridge would potentially connect the garage to a staircase and elevator connecting to the middle of the transit center island.

- Pedestrian access to the transit center site would be from the existing and reconstructed sidewalks along Rainier Avenue S and S Grady Way. A new sidewalk would be constructed along the eastern side of the transit center, along the frontage of Lake Avenue S. Pedestrian sidewalks would also be constructed within the transit center site along the north and south sides of the bus loop, from Rainier Avenue S and Lake Avenue S to the park-and-ride garage, from S Grady Way north into the site, and between the park-and-ride garage and the bus loop.

To access the South Renton Transit Center from I-405, BRT vehicles heading in a westerly direction (southbound) on I-405 would use the exit onto SR 167 N/Rainier Avenue S into an existing northbound, curbside business access and transit (BAT) lane. BRT buses would stay in the existing BAT lane across S Grady Way along Rainier Avenue S. BRT vehicles heading in an easterly direction (northbound) on I-405 would access the South Renton Transit Center using the existing exit onto SR 167 N/Rainier Avenue S. To improve transit speed and reliability, northbound BRT vehicles would use a new short section of a bus-only, bus-on-shoulder lane on northbound SR 167 that would be constructed starting at the existing loop ramp from SR 167 to southbound I-405 and extending north approximately 200 feet to connect with the existing BAT lane.

Once across S Grady Way, BRT vehicles heading northbound would turn right into the transit center's bus loop from a new signalized intersection at Rainier Avenue S and Hardie Avenue SW. This new intersection would also be the exit point for buses leaving the transit center and would be the primary ingress and egress location for the buses. Within this intersection, the existing raised, landscaped median in Rainier Avenue S would be removed to allow for turning movements, and crosswalks would be provided at each of the four roadway crossings. North of this intersection, the existing center median within Rainier Avenue S would be removed for a new southbound bus-only left-turn pocket that would allow buses to turn left into the transit center; a small section of a center median may remain at the southern end of the bus-only left-turn pocket. At the connection to Rainier Avenue S, Hardie Avenue SW would be reconstructed to realign the southbound lane adjacent to the northbound lane. This shift would require removing the northern portion of an existing raised, landscaped island. In place of the existing southbound lane on Hardie Avenue SW, a landscaped curb would be constructed, connecting with the remaining portion of the existing island. For general-purpose traffic, the southbound lane on Hardie Avenue SW would be right-turn only. Buses on Hardie Avenue SW would be able to travel through the intersection into the transit center.

A secondary bus access into the transit center's bus loop would be from the east side of the site from Lake Avenue S. This secondary access would also provide connectivity to the bus bays and layover spaces at the existing South Renton Park-and-Ride located just east of the South Renton Transit Center. Access from Lake Avenue S provides bus circulation and access from S Grady Way, Shattuck Avenue S, and S 7th Street. Parking for operation and maintenance vehicles would be located parallel to the Lake Avenue S access to the bus loop.

In the southern portion (adjacent to S Grady Way) and the eastern portion of the site (adjacent to Lake Avenue S) there is an existing Bonneville Power Administration power line easement. Along the south boundary, the easement is approximately 100 feet in width. In the eastern portion of the site the easement is approximately 200 feet in width. Prior to the start of

construction, Sound Transit would coordinate with the Bonneville Power Administration, and utility providers as needed, to ensure construction activities would not interfere with their facilities and service. Once constructed, the transit facilities would not alter, affect, or interfere with this existing 240 kilovolt transmission line across the site. The easement area under the transmission lines would primarily be green space (where existing pavement would be removed) or would consist of ground-level improvements, such as the driveway into the park-and-ride garage off of Lake Avenue S and the eastern portion of the transit loop. In addition, the existing sculpture located at the northeast corner of the intersection of Rainier Avenue S and S Grady Way, adjacent to the southwest corner of the transit center site, would remain.

BRT vehicles leaving the South Renton Transit Center would turn left onto Rainier Avenue S into an existing, southbound curbside BAT lane and then onto either northbound or southbound I-405 using existing on-ramps. Signal-timing improvements would be made, including adding TSP to the traffic signal at the intersection of S Grady Way and southbound SR 167 and at Rainier Avenue S and SW 7th Street.

2.2.3.1 Utilities and connections

Anticipated utilities to serve this project component include electric power (transmission and distribution), storm drainage, sanitary sewer, water, public agency telecommunications, and commercial telecommunications. Electric power and telecommunications would be tied into utilities currently available near the project component, such as either from S Grady Way or Rainier Avenue S. Electrical service would be coordinated with the local electrical service provider (Puget Sound Energy) who would extend service to the site. Construction within the existing power line easement would be limited to equipment that would not interfere with the high voltage, overhead power lines. Potential conflicts may exist between existing utilities and structure foundations, which would require relocating the existing utilities.

For this project component, stormwater within the transit center site would be collected underground and detention would be provided either above grade or below grade as required. Currently, three compost amended biofiltration swales are proposed on-site upstream of existing catch basins and would tie into the existing catch basins. Flow control and water quality treatment would be provided as required by the *City of Renton Surface Water Design Manual* (City of Renton 2017). Stormwater facilities would ultimately tie into existing conveyance systems. Within the Rainier Avenue S/SR 167 right-of-way, stormwater would be collected underground and detention would be provided either above grade or below grade as required. Flow control and water quality treatment would be provided as required by WSDOT's *Highway Runoff Manual* (WSDOT 2019a), and stormwater facilities would tie into the existing conveyance systems.

2.2.3.2 Site work

For construction of the South Renton Transit Center, the contractor would likely stage the necessary equipment and materials on the site. For construction of the bus-on-shoulder lane along SR 167, the contractor may stage equipment and materials in the area to the east of SR 167, within the existing, unpaved right-of-way for I-405.

Dewatering is potentially anticipated at the South Renton Transit Center depending on the type of foundation used for the parking garage.

Prior to construction, the existing buildings on-site would be removed and properly disposed of and on-site remediation would be completed as identified in the Phase II Environmental Site Assessment (Shannon & Wilson 2018). The site would be cleared and graded as needed for the proposed transit center features and to provide adequate drainage.

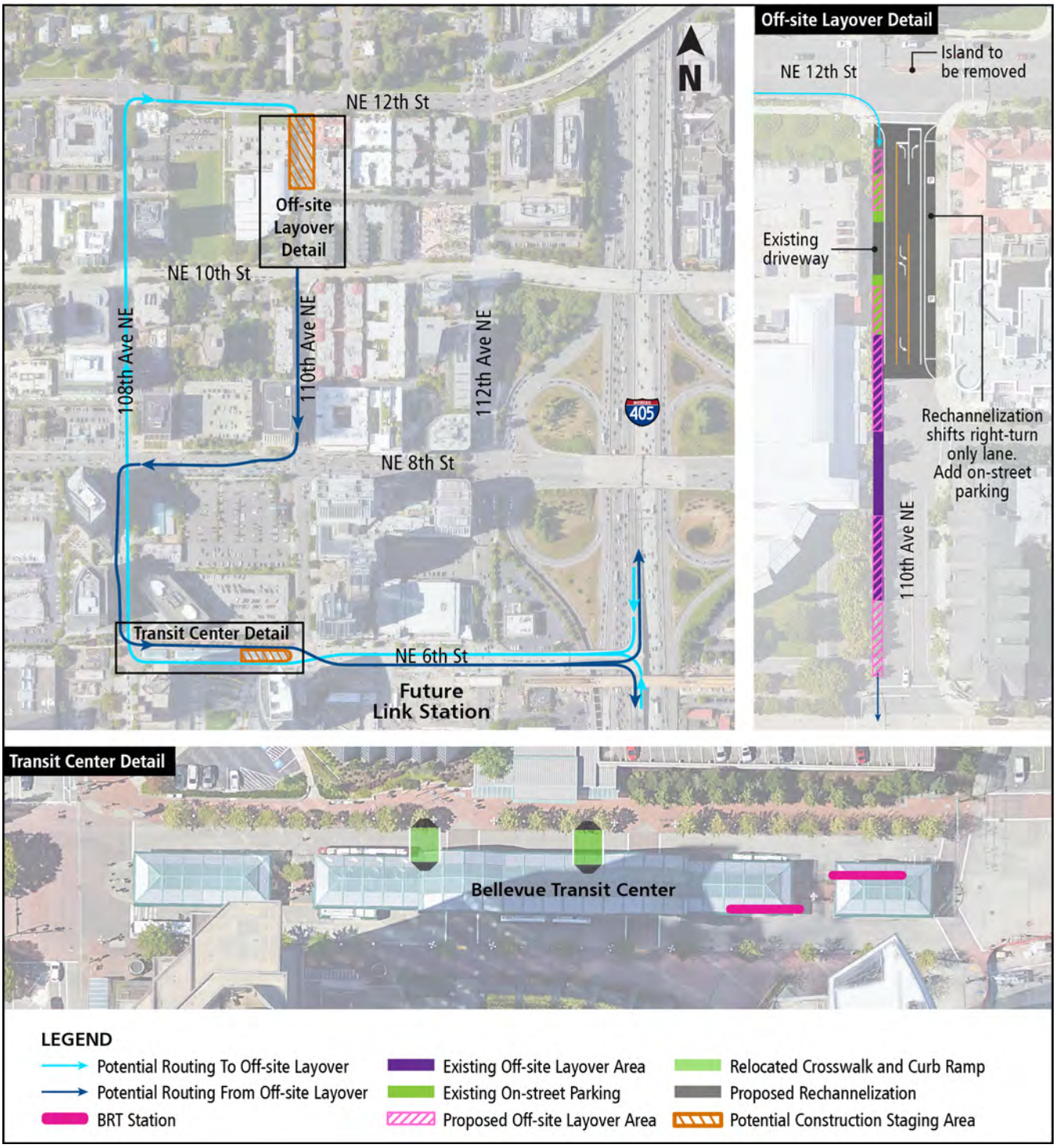
Concrete paving would be used for all driveways and bus and large maintenance vehicle parking areas. Limited areas of asphalt paving would be provided in areas trafficked by personal vehicles. A retaining wall with a maximum height of 5 feet would be constructed along the northern edge of the site. The site would be equipped with lighting to support operations and as needed for security. Landscaping would be provided in designated areas and in accordance with City of Renton requirements, including regulations relating to maintenance and irrigation.

2.2.4 Bellevue Transit Center and Off-site Layover

Figure 2-4 provides a graphic representation of the proposed Bellevue Transit Center improvements, off-site layover space, and potential BRT routing to and from the improvements and I-405.

At the Bellevue Transit Center, two existing bus bays would be modified with the standard station elements for the BRT service. The existing height of the transit center island would remain, as would the shelter over the transit center island; a BRT-branded pylon would be installed to identify the bays used for the BRT service. On the north side of the transit center island, two existing crosswalks across NE 6th Street would be relocated (shifted slightly west from their current locations). To maintain Americans with Disability Act accessibility at these relocated crosswalks, the existing curb ramps on the transit center island and on the north side of NE 6th Street would be re-graded. This regrading would be coordinated with the City of Bellevue's Downtown Bellevue Exceptional Intermodal Connections project to raise the intersections east and west of the transit center (City of Bellevue 2020).

The BRT vehicles would have on-street layover along 110th Avenue NE in front of the Bellevue Library, which is less than one-half mile north of the transit center. To access the layover space from the transit center, BRT vehicles would be anticipated to turn right onto 108th Avenue NE, then right onto NE 12th Street, and then right onto 110th Avenue NE.



SOURCE: Sound Transit 2020

Figure 2-4 Bellevue Transit Center and Off-site Layover

In the northern portion of 110th Avenue NE, the roadway cross-section would be modified. On the west side of 110th Avenue NE the existing on-street parking would be removed to provide additional bus layover capacity north and south of the existing driveway into the library parking garage. The one existing southbound through lane would remain. In the northbound direction, the rechannelization includes shifting the right-turn-only lane slightly west to provide on-street parking spaces along the east side of the street to replace what was removed along the west side of the street. Through re-striping, the existing painted median would be replaced with a left-turn-only pocket from 110th Avenue NE to NE 12th Street. No changes to the existing sidewalks are proposed. The existing raised island in the middle of the intersection of 110th Ave NE and NE 12th Street would be removed. In the southern portion of 110th Avenue NE, the existing bus layover space just north of NE 10th Street would remain.

From the layover space, BRT vehicles would be anticipated to access the Bellevue Transit Center by heading south on 110th Avenue NE, turning right onto NE 8th Street, left onto 108th Avenue NE, and then left onto NE 6th Street into the transit center.

2.2.4.1 Utilities and connections

Anticipated utilities needed to serve the BRT station include electric power, communications, and possibly water, which would be connected to utilities currently available in the transit center site.

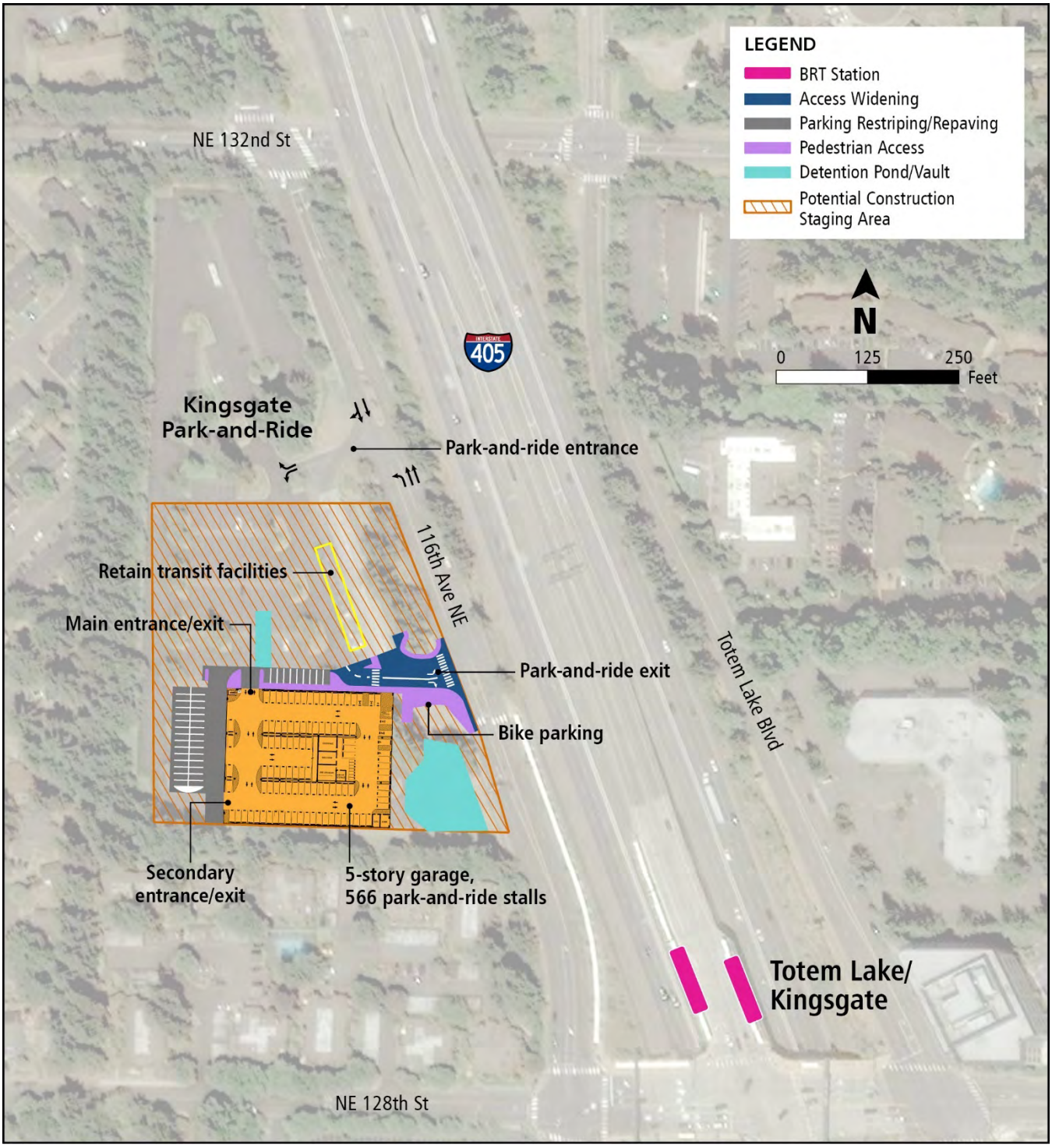
For this project component, flow control and water quality treatment would be provided as required by the City of Bellevue. Stormwater would ultimately tie into the existing conveyance systems. For the work at the Bellevue Transit Center, the contractor would likely stage the necessary equipment and materials all within the existing transit center.

2.2.4.2 Site work

For the layover area, construction staging would be expected within the existing right-of-way for 110th Avenue NE. Off-site staging areas are not anticipated.

2.2.5 Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage

Figure 2-5 provides a graphic representation of the proposed Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage.



SOURCE: Sound Transit 2020

Figure 2-5 Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage

The existing Totem Lake Freeway Station is located on the in-line direct access ramps that extend from the center of I-405 up to the NE 128th Street overcrossing of I-405 (on the north side of NE 128th Street). For the Totem Lake/Kingsgate BRT Station, one bay of each existing station pair would be transformed into a BRT station with the standard station elements. TVMs may be installed at the station platform or they may just be located at the Kingsgate Park-and-Ride Garage. At this station, the existing 6-inch height of the platforms and the existing shelter over the station platforms would remain. TSP would be added at the intersection of the in-line ramp terminal and NE 128th Street.

The existing Kingsgate Park-and-Ride lot is located west of the Totem Lake/Kingsgate Station along 116th Avenue NE. The Kingsgate Park-and-Ride site is approximately 8 acres in size and consists of 502 surface park-and-ride spaces and an existing bus transit loop currently used by Sound Transit express routes, several King County Metro routes, and one Community Transit route. The site is owned by WSDOT, considered to be right-of-way for I-405, and is operated and maintained by King County Metro.

This project component includes adding 400 park-and-ride spaces at the Kingsgate site by constructing a garage structure in the southern portion of the existing surface park-and-ride lot to create a total of approximately 900 park-and-ride spaces on the site. Sound Transit would construct a 5-story park-and-ride garage with approximately 566 park-and-ride stalls. The 566 park-and-ride stalls would replace 166 surface park-and-ride spaces that would be displaced by the garage and would provide an additional 400 park-and-ride spaces. The park-and-ride garage would be equipped with lighting to support operations and as needed for safety and security. Landscaping would be provided in designated areas in accordance with City of Kirkland and Sound Transit requirements, including maintenance and irrigation. Security cameras are anticipated to be used in the vicinity of the garage structure.

Access to the Kingsgate site would continue to be through two driveways from 116th Avenue NE, and the existing on-site circulation would not change. The northern driveway along 116th Avenue NE would remain as is and would continue to be the only entrance to the park-and-ride lot, with vehicles southbound on 116th Avenue NE turning right and vehicles northbound on 116th Avenue NE turning left. To access the park-and-ride garage, vehicles from 116th Avenue NE would use this northern driveway and then circulate through the surface park-and-ride aisles to the main garage entrance/exit on the northwest corner of the structure or the secondary access on the southwest corner of the structure.

Vehicles exiting the garage would turn right immediately past the proposed single row of park-and-ride stalls located along the northern side of the garage, drive along the aisle, and exit the site using the southern driveway to 116th Avenue NE. The existing southern driveway would be shifted slightly north to accommodate the garage structure. This shift in the driveway location would result in a slight modification to the existing bus loop, located just north, that uses this driveway. The existing bus loop would remain on-site. The two lanes of this driveway would continue to be one right-turn-only and one left-turn-only to exit the site. Asphalt paving would be provided in areas trafficked by personal vehicles. Additional work within the Kingsgate site includes providing sidewalks for pedestrian access from 116th Avenue NE along the north side of the garage to the main entrance. This sidewalk would connect to the existing crosswalk across 116th Avenue NE to the covered walkway along the east side that continues south and then east to connect to the Totem Lake/Kingsgate Station.

2.2.5.1 Utilities and connections

Anticipated utilities to serve this project component include electric power (transmission and distribution), storm drainage, sanitary sewer, water, public agency telecommunications, and commercial telecommunications. Electric power and telecommunications would be tied into utilities currently available near the project component. Electrical service would be coordinated with the local electrical service provider (Puget Sound Energy) who would extend service to the site from 116th Avenue NE. Potential conflicts may exist between existing utilities and the proposed garage structure foundation, which would require relocation of the existing utilities.

For this project component (both the Totem Lake Station and the Kingsgate Park-and-Ride Garage), stormwater would be collected underground and detention would be provided either above grade or below grade as required. Stormwater management facilities would include modifications to the existing detention pond in the southeast corner of the site, a bioretention swale along the south side of the garage, and a detention vault that would be located underground, below the surface park-and-ride stalls (**Figure 2-5**). Flow control and water quality treatment would be provided as required by WSDOT's *Highway Runoff Manual* (WSDOT 2019a). Stormwater would ultimately tie into the existing conveyance systems.

2.2.5.2 Site work

For the work at the Totem Lake Station and the Kingsgate Park-and-Ride, the contractor would likely stage the necessary equipment and materials on the Kingsgate site. The Kingsgate Park-and-Ride lot was constructed with Federal Highway Administration funds. A requirement of this funding is to maintain the existing 502 park-and-ride stalls associated with the lot. During construction of the Kingsgate Park-and-Ride Garage, a number of the existing surface stalls within the footprint of the garage and areas needed for construction staging would be inaccessible. Prior to construction, nearby temporary parking spaces would be identified for use as temporary replacement parking during construction. These temporary parking spaces are anticipated to be from existing, nearby properties with underused parking that could be leased through temporary construction easements.

Prior to construction, the southern portion of the Kingsgate Park-and-Ride lot where the garage would be located would be cleared of existing trees/vegetation and pavement, and would be graded as needed for the garage structure and the drainage vault. The existing trees along the southern and western site boundary would remain, as would the existing raised berm along the western site boundary.

Concrete paving would be used for all driveways and bus and large maintenance vehicle parking areas. Asphalt paving would be provided in areas trafficked by personal vehicles. The park-and-ride garage would be equipped with lighting to support operations and as needed for safety and security. Landscaping would be provided in designated areas in accordance with City of Kirkland requirements, including maintenance and irrigation.

2.2.6 Brickyard Station and Roadway Improvements

Figure 2-6 provides a graphic representation of the proposed Brickyard Station, the new pedestrian bridge, and associated roadway improvements.

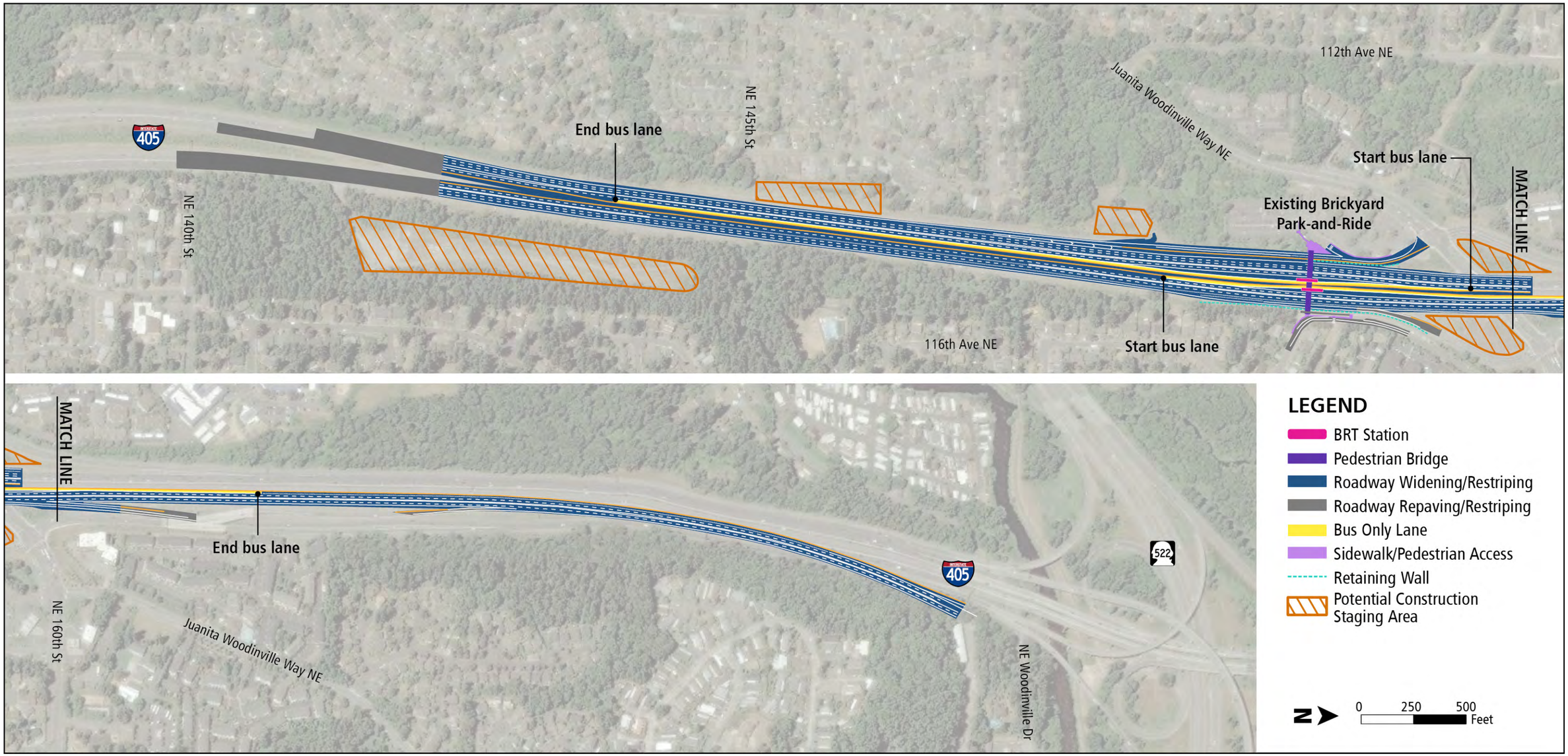


Figure 2-6 Brickyard Station and Roadway Improvements

The proposed new BRT station (northbound and southbound station platforms) would be located at-grade within the center of the I-405 roadway and right-of-way. A bus-only lane would be added in both the northbound and southbound direction (for a total length of approximately 4,000 feet southbound and 3,000 feet northbound), to allow BRT vehicles to safely decelerate to pick up/drop off at the BRT station platform and to accelerate from the station platforms and merge into I-405 traffic. The addition of these northbound and southbound bus-only lanes and the BRT station platforms would require realigning and widening the existing I-405 roadway to the east and west. The BRT station would include a branded shelter, benches, and raised platforms for level or near-level passenger boarding, in addition to the standard elements. A pedestrian bridge over I-405 would connect the two BRT station platforms and would connect the BRT station to the Brickyard Park-and-Ride lot to the west. Between the I-405 roadway surface and the bottom of the pedestrian bridge, the proposed vertical clearance would be approximately 17.5 feet. From each BRT station platform, access to the pedestrian bridge would be provided by stairs and at least one elevator. Stairs and an elevator would be provided from the pedestrian bridge to access the Brickyard Park-and-Ride lot. Although funding is not currently available, WSDOT, Bothell, Kirkland, and Sound Transit are currently considering an extension of this pedestrian bridge to the east side of I-405, with a stairway and ramp, and possibly an elevator, connecting to 116th Avenue NE.

2.2.6.1 Utilities and connections

Anticipated utilities needed to serve the BRT station include electric power, public agency telecommunications and commercial telecommunications, and water, which would be tied into utilities currently available near the project component.

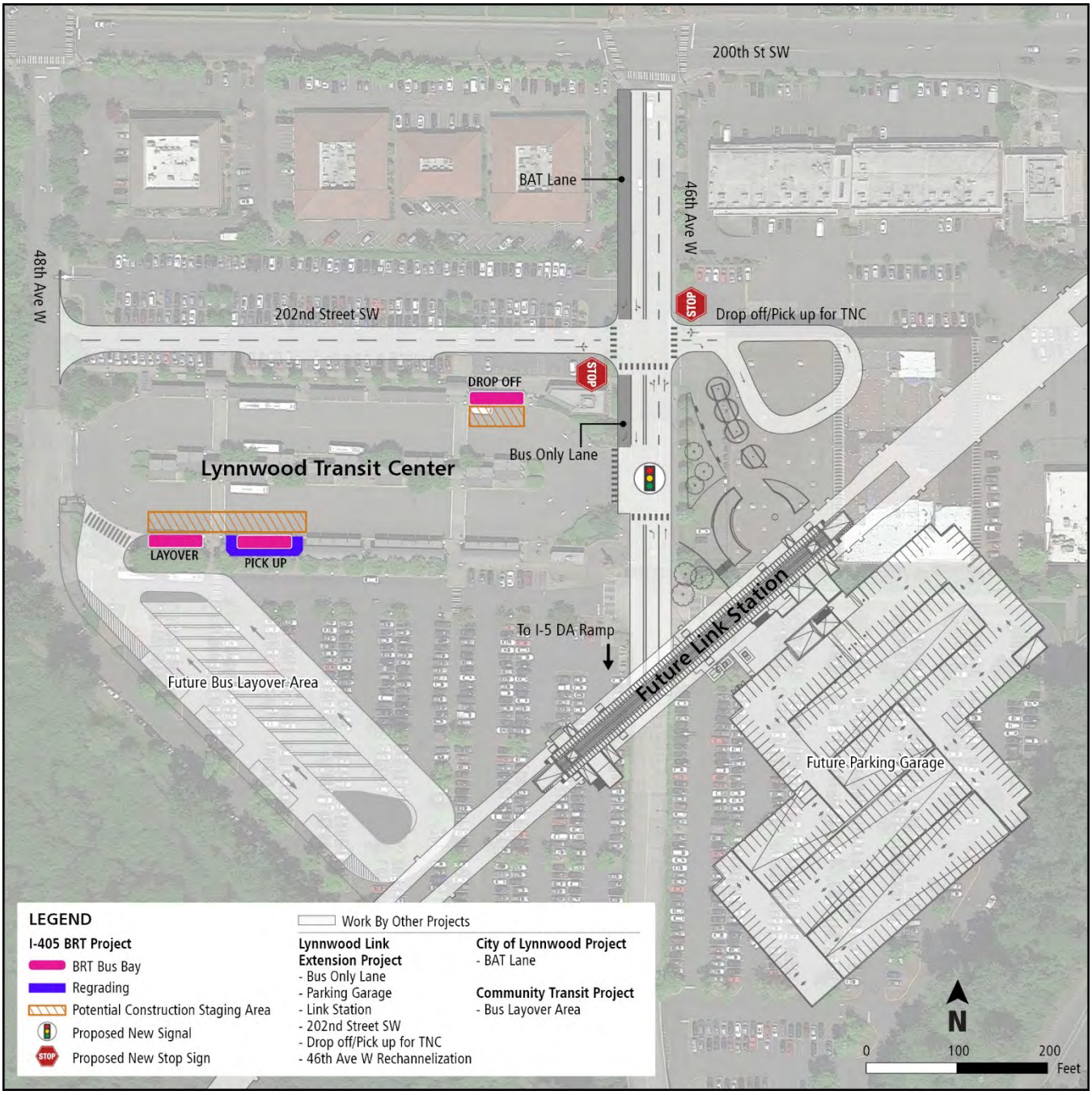
Stormwater would be collected underground and detention would be provided as required. Flow control and water quality treatment would be provided as required by WSDOT's *Highway Runoff Manual* (WSDOT 2019a), and stormwater facilities would ultimately tie into the existing conveyance systems. Near the BRT station platforms, where the I-405 widening would be greatest, new noise walls may be needed along the east side of I-405. A new retaining wall would be constructed along the west side of I-405, for approximately 1,110 feet in the northbound direction and 465 feet in the southbound direction, with a maximum height of 6 feet, from the pedestrian bridge north along the I-405 on-ramp from Juanita Woodinville Way NE.

2.2.6.2 Site work

For this project component, the contractor would be expected to stage the necessary construction equipment and materials within the existing right-of-way for I-405 and, potentially, the Brickyard Park-and-Ride lot.

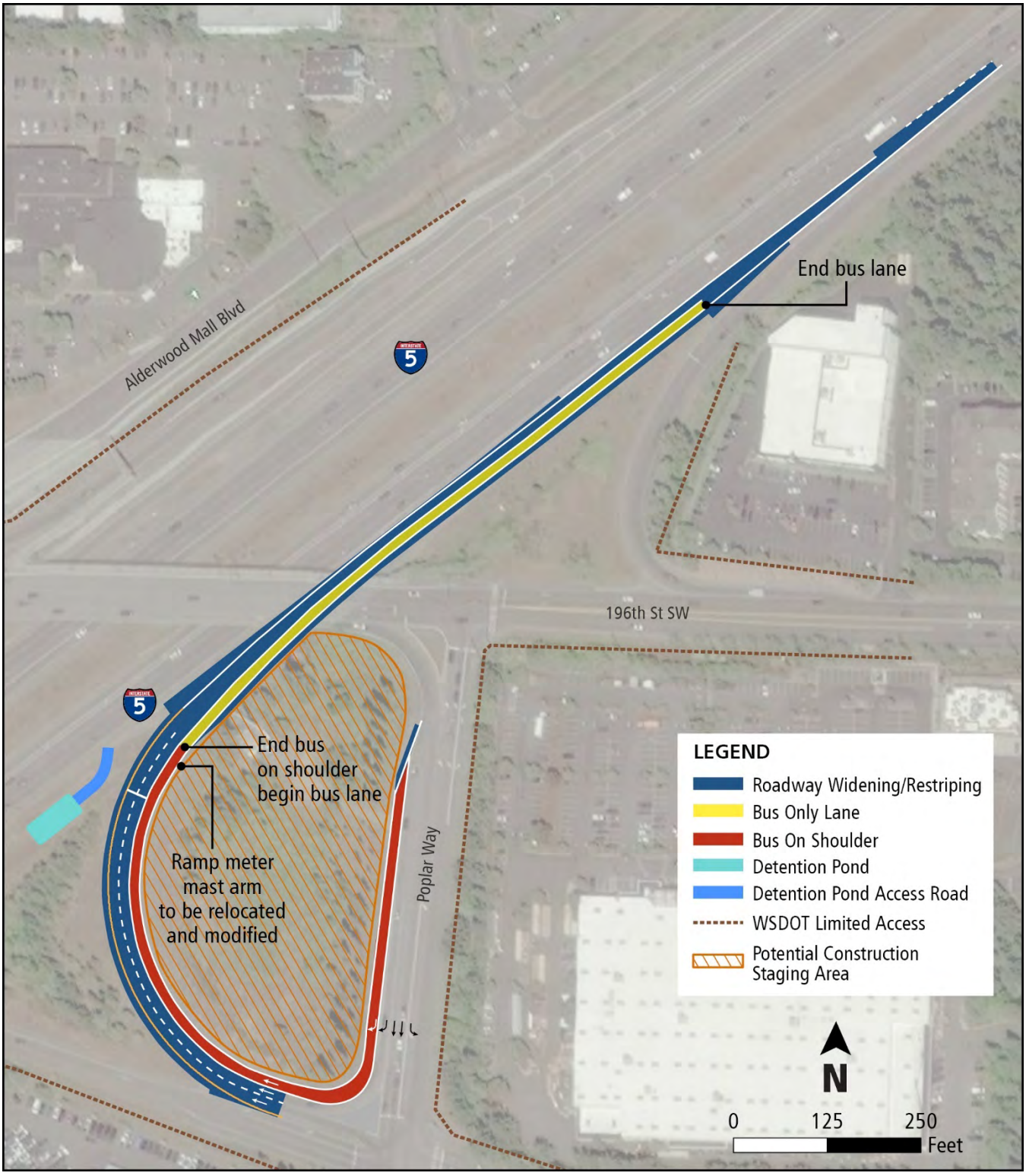
2.2.7 Lynnwood City Center Transit Station BRT and Roadway Improvements

Figure 2-7 provides a graphic representation of the proposed Lynnwood City Center Transit Station BRT and Roadway Improvements. **Figure 2-7** also shows the Lynnwood Link light rail station, transit center bus layover area, and roadway improvements that will be constructed as part of Sound Transit's Lynnwood Link Extension project. **Figure 2-8** shows the proposed roadway improvements that would be constructed as part of the I-405 BRT Project on Poplar Way and the loop ramp onto I-5 northbound.



SOURCE: Sound Transit 2020

Figure 2-7 Lynnwood City Center Transit Station BRT and Roadway Improvements



SOURCE: Sound Transit 2020

Figure 2-8 Lynnwood City Center Transit Station BRT and Roadway Improvements: Poplar Way Loop Ramp Roadway Improvements

BRT buses would access the Lynnwood City Center transit station by using the existing Alderwood Mall Boulevard exit from I-5 south, traveling along 196th Street SW, turning left at 44th Avenue W, right at 200th Street SW, left onto 46th Avenue W, and then into the transit center. Along this routing, TSP would be added to existing traffic signals. To improve access to and from the transit center, modifications would be made at two intersections along 46th Avenue W. The first intersection, just north of the transit center, would include two northbound and two southbound lanes with stop signs controlling the east and west legs of the intersection. The second intersection, at the entrance to the transit center, would be modified to include a new traffic signal and to include crosswalks.

At the existing Lynnwood City Center transit station, one bay in the northeast portion of the transit center loop would be modified to accommodate the BRT service as a drop-off bay with a 6 to 9 inch curb height. In the southwest portion of the transit center loop, one bay would be modified to accommodate BRT pick up and one bay would be converted to a layover space. At the BRT pick-up bay, in addition to the standard station elements, the platform and adjacent area would be re-graded for near-level passenger boarding. The existing shelters over the bays would remain.

Leaving the transit center, BRT vehicles would follow the same routing to 196th Street SW and then would use the Poplar Way on-ramp to access I-5 north and then I-405 south. Along Poplar Way (south of 196th Street SW) and the I-5 northbound on-ramp, the roadway and ramp would be widened for a bus-only bus-on-shoulder lane for BRT vehicles to use to bypass congestion.

Leaving the transit center, BRT vehicles would follow the same routing to 196th Street SW and then would use the Poplar Way on-ramp to access I-5 north and then I-405 south. Along Poplar Way (south of 196th Street SW) and the I-5 northbound on-ramp, the roadway and ramp would be widened for a bus-only lane for BRT vehicles to use to bypass congestion. The existing ramp meter mast arm would be relocated and modified.

2.2.7.1 Utilities and connections

Anticipated utilities include electric power, storm drainage, public agency telecommunications, and commercial telecommunications. Electric power and telecommunications would be tied into utilities currently available near the project component.

At the Lynnwood City Center transit center, stormwater would be collected underground and detention would be provided as required. Flow control and water quality treatment would be provided as required by the *Washington State Department of Ecology Stormwater Management Manual for Western Washington* (Ecology 2019). Stormwater would ultimately tie into the existing conveyance systems. For the Poplar Way ramp modifications, stormwater flow control and water quality treatment would be provided as required by WSDOT's *Highway Runoff Manual* (WSDOT 2019a).

2.2.7.2 Site work

For construction at the Lynnwood City Center transit station, the contractor would likely stage the necessary equipment and materials within the transit center. For construction of the bus-only lane along Poplar Way and the I-5 on-ramp, the contractor may stage equipment and materials in the existing, unpaved right-of-way within the center of the Poplar Way Loop Ramp onto I-5.

3 REGULATORY CONTEXT

Regulations that apply to critical areas that were a part of this assessment 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), Washington State Department of Ecology (Ecology), and the local agencies along the project corridor. The Washington Department of Fish and Wildlife (WDFW) also regulates work within streams. Regulatory implications associated with development in wetlands include those described in this section. Tree protection and replacement requirements are regulated by the local jurisdiction when tree removals occur within the jurisdiction's right-of-way. However, when tree removal occurs within the rights-of-way of state highways or interstates, they are regulated by WSDOT.

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 non-jurisdictional under the Clean Water Act. The Corps makes the jurisdictional determination.

Project components that would include filling wetlands would require coverage under a Section 404 permit. If proposed fill is limited to a total of 0.5 acre or less, the project component could likely be covered under a Section 404 Nationwide Permit; if greater than 0.5 acre of fill is proposed, a Section 404 Individual Permit would be required.

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.

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 [RCW]) 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.

3.2.2 Trees

The removal and protection of trees located within WSDOT right-of-way are regulated by policies in the WSDOT *Roadside Policy Manual* (2015). WSDOT separates trees into three categories based on their diameter at breast height (dbh) as indicated below:

1. **Category 1:** Mature, old-growth, large specimen, or heritage trees greater than 30 inches in diameter
2. **Category 2:** Moderate-sized trees (excluding alder [*Alnus rubra*] and cottonwood [*Populus balsamifera*]) between 4 and 30 inches in diameter
3. **Category 3:** Small coniferous and other late successional species trees less than 4 inches in diameter

3.3 Local

3.3.1 Wetlands and streams

All wetlands and streams identified by Sound Transit in the field within or adjacent to the project component footprint occur within the City of Tukwila. An additional three wetlands were identified by WSDOT within the Cities of Bothell and Kirkland (see Section 5.6.3). Therefore, this section regarding local regulations only focuses on the critical area ordinances of those three cities.

3.3.1.1 City of Tukwila

Wetlands

The Tukwila Municipal Code (TMC) determines buffer widths based on the wetland category designated in accordance with the Washington State Wetland Rating System for Western Washington (Hruby 2004). Definitions of the various wetland categories per TMC 18.45.080.B are presented below.

Category I – Those wetlands that (i) represent a unique or rare wetland type; (ii) are more sensitive to disturbance than most wetlands; (iii) are relatively undisturbed and contain ecological attributes that are impossible to replace during a human lifetime; or (iv) provide a high level of function.

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.

Category III – Those wetlands that have a moderate level of function. These wetlands generally have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape.

Category IV – Those wetlands with the lowest levels of functions and are often heavily disturbed. These wetlands should be able to be replaced or improved, however still need protection because they may provide important functions.

Table 3-1 presents the standard wetland buffers as required by TMC 18.45.080.D.

Table 3-1 Wetland buffer standards for the City of Tukwila

Wetland category	Standard wetland buffer width
Category I	100 feet
Category II	100 feet
Category III	80 feet
Category IV	50 feet

SOURCE: TMC 18.45.080.D

Per TMC 18.45.080.F(2), buffer reduction with enhancement may be allowed by the Department of Community Development Director with an approved buffer enhancement plan prepared by a qualified wetland biologist if:

a) Additional protection to wetlands will be provided through the implementation of a buffer enhancement plan;

b) The existing condition of the buffer is degraded; and

c) Buffer enhancement includes, but is not limited to the following:

- Planting vegetation that would increase value for fish and wildlife habitat or improve water quality and hydrology;
- Enhancement of wildlife habitat by incorporating structures that are used by wildlife (e.g., bat boxes, snags); or
- Removing non-native plant species and noxious weeds from the buffer area and replanting the area subject to the first bullet above.

Streams

Stream, or watercourses, are defined by TMC 18.06.920 as being a "*course or route formed by nature or modified by man, generally consisting of a channel with a bed and banks or sides substantially throughout its length along which surface-water flows naturally*."

The TMC Critical Areas Ordinance (CAO) determines development standards and watercourse buffer widths based on the stream classification (TMC 18.45.100). Watercourses are classified as Types 1 through 4, consistent with the Washington Department of Natural Resources (WDNR) water typing categories that are noted in parentheses, as follows:

- **Type 1 (S) watercourses** are inventoried as shorelines of the state, under RCW 90.58. These watercourses are regulated under TMC Chapter 18.44, Shoreline Overlay District.
- **Type 2 (F) watercourses** are known to be used by fish or meet the physical criteria to be potentially used by fish and that have perennial (year-round) or seasonal flows.
- **Type 3 (Np) watercourses** have perennial flows and do not meet the criteria of a Type F stream or have been proven not to contain fish using methods described in the Forest Practices Board Manual Section 13 (WDNR 2002).
- **Type 4 (Ns) watercourses** have intermittent flows (do not have surface flow during at least some portion of the year) and do not meet the physical criteria of a Type F watercourse.

Table 3-2 presents the standard watercourse buffers as required by TMC 18.45.100. Buffers on Type S watercourses are dictated by TMC Chapter 18.44, Shoreline Overlay District. The only mapped shorelines within Tukwila are the Green/Duwamish River and the Black River, neither of which is within the project vicinity.

Table 3-2 Stream buffer standards for the City of Tukwila

Stream type	Standard buffer width
Type 1 (S)	As noted in TMC 18.45.100
Type 2 (F)	100 feet
Type 3 (Np)	80 feet
Type 4 (Ns)	50 feet

SOURCE: TMC 18.45.100.C

Per TMC 18.45.100.E(1), the standard buffer of a watercourse may be reduced on a case-by-case basis where the buffer is significantly degraded, provided the remaining buffer is enhanced in accordance with an approved buffer enhancement plan, prepared by a qualified professional, and does not contain slopes 15 percent or greater.

3.3.1.2 City of Kirkland

Wetlands

The Kirkland Zoning Code (KZC) CAO determines wetland buffer widths based on the wetland rating and rating habitat score. **Table 3-3** presents the standard wetland buffers as required by KZC 90.55. According to KZC 90.55, the buffer must meet certain vegetative standards, described in KZC 90.130. If the vegetative standard is not complied, the city would increase the buffer width by 33 percent. For example, a 75-foot buffer without the vegetative standards would be a 100-foot buffer.

Table 3-3 Wetland buffer standards for City of Kirkland

Wetland category	Standard wetland buffer width per habitat score			
	Habitat Score of 3 – 4	Habitat Score of 5	Habitat Score of 6 – 7	Habitat Score of 8 – 9
Category I: Bogs and high conservation areas	190 feet	190 feet	190 feet	225 feet
Category I: Others	75 feet	105 feet	165 feet	225 feet
Category II	75 feet	105 feet	165 feet	225 feet
Category III	60 feet	105 feet	165 feet	225 feet
Category IV	40 feet			

SOURCE: KMC 90.55

Streams

The KZC determines development standards and stream buffer widths based on the stream classification (KZC 90.65.1). Within Kirkland, watercourses are 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.

Table 3-4 presents the standard stream buffers within the City of Kirkland per KZC 90.65.1.

Table 3-4 Stream buffer standards for City of Kirkland

Stream type	Standard stream buffer width
Type F	100 feet
Type Np	50 feet
Type Ns	50 feet

SOURCE: KMC 90.6.1

3.3.1.3 City of Bothell

Wetlands

The Bothell Municipal Code (BOMC) CAO determines wetland buffer widths based on the wetland category and habitat score. **Table 3-5** presents the standard wetland buffers as required by BOMC 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 BOMC 13.13.020.B, the BOMC 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 3-5 Wetland 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: BMOC 14.04.530.F

Streams

The BOMC critical areas regulations determine development standards and stream buffer widths based on the stream classification (BOMC 14.04). BOMC 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, streams are classified as either Type F, Type Np, or Type Ns in accordance with WAC 222-16-030, as defined above for the City of Kirkland. Standard stream buffers as required by BOMC 14.04.930 are presented in **Table 3-6**.

Table 3-6 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: BMOC 14.04.930
NOTES: [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.

3.3.2 Fish and Wildlife Habitat Conservation Areas

In addition to wetlands and streams, the Washington State Growth Management Act requires all local jurisdictions to regulate actions that may directly and indirectly impact fish and wildlife habitat (Washington State Department of Community, Trade, and Economic Development 2007). According to WAC 365-190-130, the following definition of Fish and Wildlife Habitat Conservation Areas (FWHCA) applies to all local jurisdictions:

- Areas where endangered, threatened, and sensitive species have a primary association;
- Habitats and species of local importance, as determined locally;
- Commercial and recreational shellfish areas;
- Kelp and eelgrass beds; herring, smelt, and other forage fish spawning areas;
- Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat;
- Waters of the state;
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; and
- State natural area preserves, natural resource conservation areas, and state wildlife areas.

3.3.3 Significant trees

Local jurisdictions also regulate tree removal and protection of trees defined as significant when occurring in the city's right-of-way. Trees deemed to be significant by a jurisdiction have a higher level of protection. Significant tree protection is frequently more stringent when occurring in a critical area or an associated buffer. Significant trees, as defined by a city's regulations, were only observed in the Cities of Tukwila, Kirkland, and Lynnwood; therefore, this section only defines significant trees in those jurisdictions.

- The City of Tukwila defines a significant tree to be a single-trunked tree that is 6 or more inches in diameter, or a multi-trunked tree with a diameter of 2 inches or more of any trunk (TMC 18.06.775).
- The City of Kirkland defines a significant tree as being at least 6 inches dbh (KZC 95.10.14).
- The City of Lynnwood defines a significant tree as being at least 6 inches dbh; however, this does not include Lombardy poplar, native willow, native alder, black locust, or black cottonwood (LMC 17.15.080).

The City of Renton currently does not have a tree protection code or a definition of what the city considers to be a significant tree. However, according to the city's website, the Urban and Community Forestry Task Force is developing the Urban Forestry Ordinance that would include regulations for street trees. The goal is to have these new regulations incorporated into the Renton Municipal Code.

4 METHODOLOGY

The following describes the methodology used to identify and evaluate critical areas that have the potential to be affected by the project, including wetlands, streams, and FWHCAs. A list of materials reviewed is included in Section 4.2. Field investigations, which occurred over several days between July and October 2019, confirmed the presence of these critical areas.

4.1 Study areas

The study areas for this analysis include locations where the ground would be disturbed (project footprint as described in Section 2.2), either permanently or temporarily, as a result of one of the project components. The study area also includes the 500-foot area around the project footprint, where a desktop analysis was performed, to gain a context of critical areas within the landscape. The desktop review included reviewing existing literature, maps, and other materials to identify wetlands or site characteristics indicative of critical areas within the study area. The study area does not include portions of the project corridor where BRT vehicles would travel on existing roadways and no road widening is proposed.

Field surveys were only conducted within the project footprint and in WSDOT rights-of-way for I-405 and SR 518, and private properties where right-of-entry was granted. A detailed description of each study area is provided in Section 5. Since field surveys were conducted, the project design has been refined, which resulted in the project footprint being reduced. Therefore, the area covered in field surveys is largely outside of the current project footprint.

4.2 Data sources

Existing literature, maps, and other materials were reviewed to identify the likelihood of wetlands, streams, or site characteristics indicative of wetlands and streams in the study area. Sources of information included the following:

- Wetland and stream mapping from the National Wetlands Inventory (U.S. Fish and Wildlife Service [USFWS] 2019)
- Natural Resources Conservation Service Web Soil Survey (NRCS 2019)
- Washington State Department of Natural Resources Natural Heritage Program (WDNR 2019)
- Priority Habitats and Species (PHS) data (WDFW 2019a)
- SalmonScape fish database and mapping application (WDFW 2019b)
- Washington State Fish Passage database and mapping application (WDFW 2019c)
- King County Interactive Mapping Tool (iMap) (2020)
- Snohomish County Planning and Development Services Map Portal (2019)
- City of Bothell COBMap Interactive Mapping Tool (2020)
- City of Kirkland Maps Interactive Mapping Tool (2020)
- City of Bellevue Critical Hazards Map (2019)
- City of Renton COR Maps Interactive Mapping Tool (2019)
- City of Tukwila iMap Interactive Mapping Tool (2019)
- City of Lynnwood Environmentally Critical Areas Inventory maps (2016)
- City of Burien Critical Areas map (2015)
- Bus Rapid Transit I-405 Corridor Technical Memorandum: Ecosystems and Natural Resources for Alternatives Development and Evaluation (Sound Transit 2018)

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

4.3 Wetland and stream jurisdictional delineation

Sections 4.3.1 and 4.3.1.1 describe the field methods for the jurisdictional delineation of wetlands and streams, respectively. When these methods were applied, the boundaries of wetlands and streams were flagged in the field and their positions recorded using a global positioning system (GPS) unit. These boundaries have not yet been professionally surveyed. Therefore, their locations and extents currently shown on figures in this technical memorandum are considered estimated and preliminary boundaries. Boundaries will be reassessed and professionally surveyed as the design and permit processes move forward.

4.3.1 Delineated 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, stating 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 on each of the three wetland parameters (vegetation, soils, and hydrology) was recorded. This information was used to distinguish wetlands from non-wetlands. Additional information, including delineation methods and wetland delineation data sheets, are provided in Appendices C and D.

4.3.1.1 Estimated wetland boundaries

Wetland boundaries that did not occur directly in the project footprint and were not field surveyed were estimated using visual observations at the reconnaissance level. These estimated wetlands primarily occur within temporary staging/clearing areas and permanent grading areas that were not known at the time of the field visits. As design progressed and clearing and grading areas were developed, wetlands in these areas were estimated based on visual observation and GIS data, including aerial imagery, topography, and critical areas mapping. A conservative approach was taken when estimating wetland boundaries, and it is anticipated that wetland areas will decrease once formal delineations occur. No formal data plots were established in these areas. These areas will be revisited during the project's final design and permitting phase and will be formally delineated, as needed.

4.3.2 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 WSDOT's *Wetland Functions Characterization Tool for Linear Projects* (Null et al. 2000). The Ecology rating system and WSDOT characterization tool are designed to assess wetland function. 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 E provides completed Ecology rating forms for the project. Appendix F provides additional information about the WSDOT characterization system and WSDOT wetland functions field data forms for the project.

4.3.3 Streams

The assessment of streams in the study 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 or objects cast onshore); 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 assessment of the channel width, substrate, bed features, stream gradient, and fish access. The OHWM of the stream was flagged and GPS data were collected to document the stream boundary.

4.4 Fish and Wildlife Habitat Conservation Areas

In addition to field observations, a GIS analysis was performed to evaluate the presence of FWHCAs. Existing critical areas mapping was overlaid with the proposed project components to identify where impacts could occur. Mapping sources included WDFW PHS, and WDNR Natural Heritage Program mapping to determine the presence of Endangered Species Act (ESA) listed wildlife. FWHCAs that do not exist in the project alignment (e.g., kelp and eelgrass beds, shellfish areas, etc.) were not part of this analysis; rather this assessment focuses on areas where endangered, threatened, and sensitive species have a primary association. Additionally, listed wildlife species mapped at a regional level, but with no suitable habitat located in the project alignment (e.g., North American wolverine, marbled murrelet, etc.), were not included in this assessment.

4.5 Tree assessment

For the purpose of this assessment, within the project component disturbance areas trees within a city's jurisdiction were identified if they met that city's definition of a significant tree, as described in Section 3.3.3. Trees that met a city's definition of a significant tree were only observed in project component disturbance areas within the Cities of Tukwila, Kirkland, and Lynnwood. While the City of Renton currently does not have a tree protection code or a definition of what the city considers to be a significant tree, they currently have a task force to develop an Urban Forestry Ordinance. Therefore, within the City of Renton's jurisdiction, trees over 4 inches dbh were identified.

As defined in Section 3.2.2, Category 1 and 2 trees within WSDOT right-of-way were identified and categorized in accordance with WSDOT's policy definition in the WSDOT *Roadside Policy Manual* (2015). Category 3 trees, as defined by WSDOT, were not part of this assessment.

Trees were identified in the field and locations were recorded using a handheld GPS unit. The locations of these trees have not been professionally surveyed. In project component areas where the project footprint was revised post fieldwork, trees were estimated using aerial imagery.

4.6 Impact assessment

Construction and operational impacts were analyzed by evaluating the potential for the project to change or alter critical areas. As described above, the boundaries of wetlands and streams are considered to be an estimate; therefore, impact quantities in this report are also considered to be an estimate. A conservative approach was taken when calculating estimated impacts by using the greatest practical clearing and grading limits for each site. These limits will likely be reduced as design progresses.

4.6.1 Construction impacts

Construction impacts were analyzed considering the following:

- The likely extent of damage to vegetation, wetlands, and streams due to proposed grading, filling, and other construction activities
- 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 anticipated extent of construction work taking place in other critical areas found in the study areas

4.6.2 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 areas
- 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 critical areas found in the study areas

5 EXISTING CONDITIONS

5.1 Burien Transit Center and Roadway Improvements

5.1.1 Study area

The Burien Transit Center and Roadway Improvements study area is located in the City of Burien, King County, Washington. The project footprint encompasses SW 148th Street from the Burien Transit Center east across the SR 509/SR 518 interchange and along SR 518 for a distance of approximately 400 feet (**Figure 5-1**). Additional work would occur within the existing Burien Transit Center to incorporate a new station platform. The study area includes the area within 500 feet of the project footprint and is located within the Miller Creek – Frontal East Passage subwatershed within Water Resource Inventory Area (WRIA) 9: Duwamish – Green.

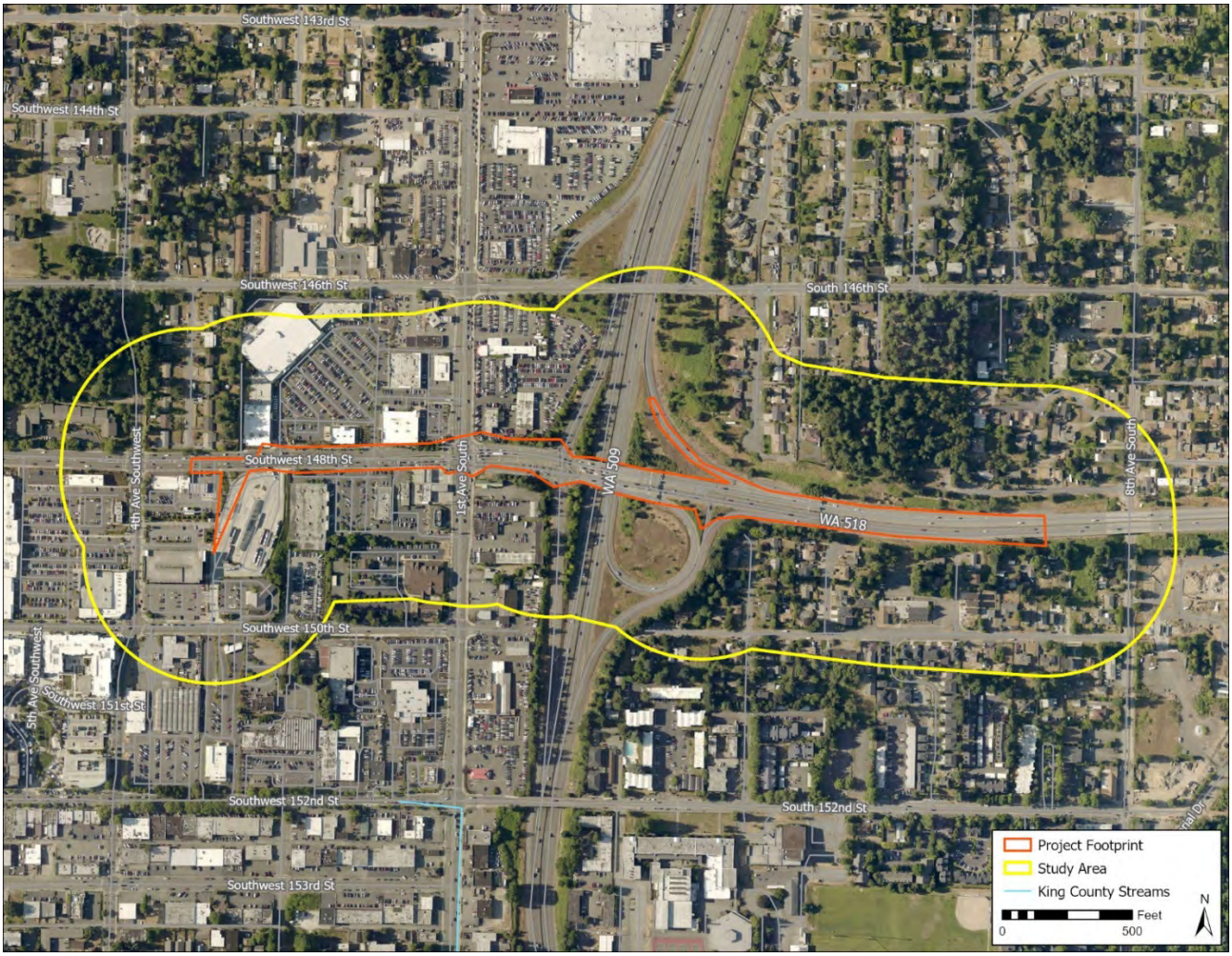


Figure 5-1 Burien Transit Center and Roadway Improvements study area

5.1.2 Habitat description

The Burien Transit Center and Roadway Improvements study area is located in a highly developed urban environment that is primarily buildings and roads. West of 1st Avenue S, little vegetation is present and is limited to street trees and commercial landscaping along SW 148th Street to the Burien Transit Center. East of 1st Avenue S, forested areas occur at the S 148th Street and SR 509 on- and off-ramp intersection on each side of SR 509. These forested areas consist of bigleaf maple (*Acer macrophyllum*), Douglas fir (*Pseudotsuga menziesii)*, and various street trees with an understory dominated by Himalayan blackberry (*Rubus armeniacus*).

Wildlife species in the study area likely include birds (e.g., American robin [*Turdus migratorius*], American crow [*Corvus brachyrhynchos*], and common pigeon [*Columba livia*]) and small mammals (e.g., Virginia opossum [*Didelphis virginiana*], eastern cottontail [*Sylvilagus floridanus*], and eastern gray squirrel [*Sciurus carolinensis*]) that are well adapted to living in a highly altered landscape and can tolerate or benefit from human disturbance. No habitat features, including snags and/or large woody debris, were observed in the study area.

5.1.3 Wetlands and streams

No wetlands or streams were observed during the field investigation. Additionally, no wetlands or streams are mapped as occurring within the study area (King County 2020; USFWS 2019). The closest mapped wetland is Lake Burien located south of SW 152nd Street, approximately 0.7 mile southwest of the study area (King County 2020). The closest mapped stream is an unnamed, piped stream beginning at the SW 152nd Street and 1st Avenue S intersection, approximately 0.25-mile south of the study area (King County 2020).

5.1.4 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, no federal or state-listed animals occur within the study area (WDFW 2019a). The closest known occurrence is Miller Creek, approximately 0.7 mile east of the study area. Listed species within Miller Creek include federally listed Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead trout (*O. mykiss*), as well as state-protected cutthroat trout (*O. clarkii*), coho salmon (*O. kisutch*), and chum salmon (*O. keta*) (WDFW 2019b). Additionally, according to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur in the study area (WDNR 2019). No additional Fish and Wildlife Habitat Conservation Areas, as defined by Burien Municipal Code (BMC) 19.40.380, were observed as occurring within the study area.

5.1.5 Tree assessment

BMC 19.10.493 defines a significant tree to be an existing, healthy tree with a dbh of at least 6 inches. No significant trees were observed in the Burien Transit Center and Roadway Improvements project component area, in the City of Burien's jurisdiction. Within WSDOT right-of-way, no trees were identified that meet WSDOT's Category 1 or 2 standards.

5.2 Tukwila International Boulevard BRT Station and Roadway Improvements

5.2.1 Study area

The Tukwila International Boulevard BRT Station and Roadway Improvements study area is located in the City of Tukwila, King County, Washington, as shown in **Figure 5-2**. The project footprint encompasses the north and south sides of SR 518 between 24th Avenue S to the east just before the 51st Avenue S/Southcenter Parkway exit to the west. The study area includes the area within 500 feet of the project footprint and is located within the Green River subwatershed within WRIA 9: Duwamish – Green.

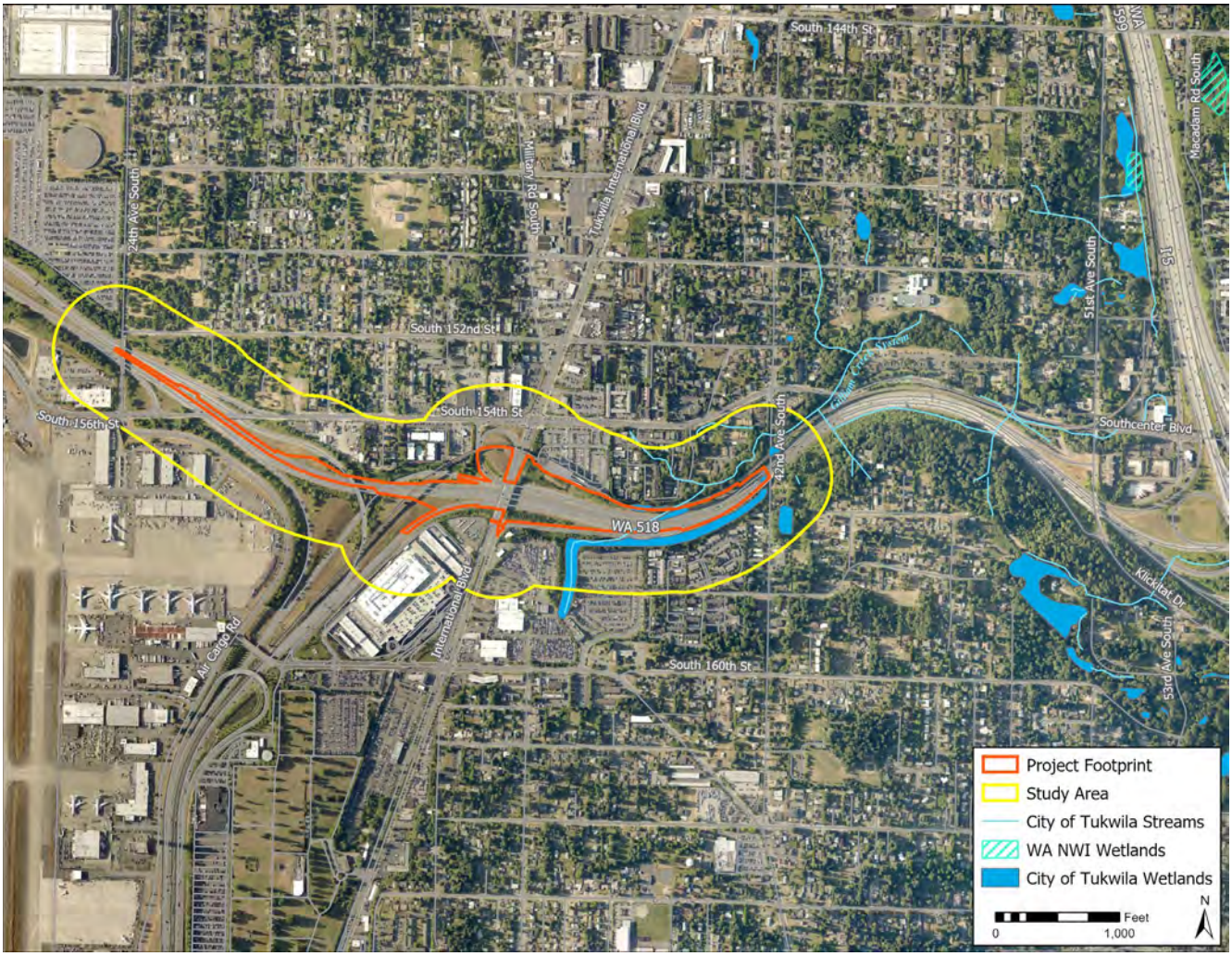


Figure 5-2 Tukwila International Boulevard BRT Station and Roadway Improvements study area

5.2.2 Habitat description

Most of the Tukwila International Boulevard BRT Station and Roadway Improvements study area is located in a highly developed urban environment that is primarily commercial and residential buildings and roads. There is a relatively undisturbed vegetated corridor that is approximately 42 acres located upslope to the south of SR 518 between 42nd Avenue S and the end of the study area just before 51st Avenue S/Klickitat Drive. This forested area contains bigleaf maple, Douglas fir, various willow species, and an understory of a mix of native and non-native shrubs and herbaceous vegetation. The vegetated corridor contains multiple streams and wetlands; however, many of the streams are piped and the wetlands are degraded.

Wildlife species in the developed portion of the study area likely include birds (e.g., American robin, American crow, common pigeon, and European starling) 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. In addition to the wildlife species likely present in the developed portion of the study area, wildlife species in the vegetated corridor portion likely include amphibians (e.g., Pacific tree frogs [*Pseudacris regilla*], long-toed salamanders [*Ambystoma macrodactylum*], and the invasive American bullfrog [*Lithobates catesbeianus*]), birds (e.g., black-capped chickadees [*Poecile atricapillus*], dark-eyed junco [*Junco hyemalis*], and Steller's jay [*Cyanocitta stelleri*]), and medium-sized mammals (e.g., raccoons [*Procyon lotor*] and coyotes [*Canis latrans*]).

5.2.3 Wetlands

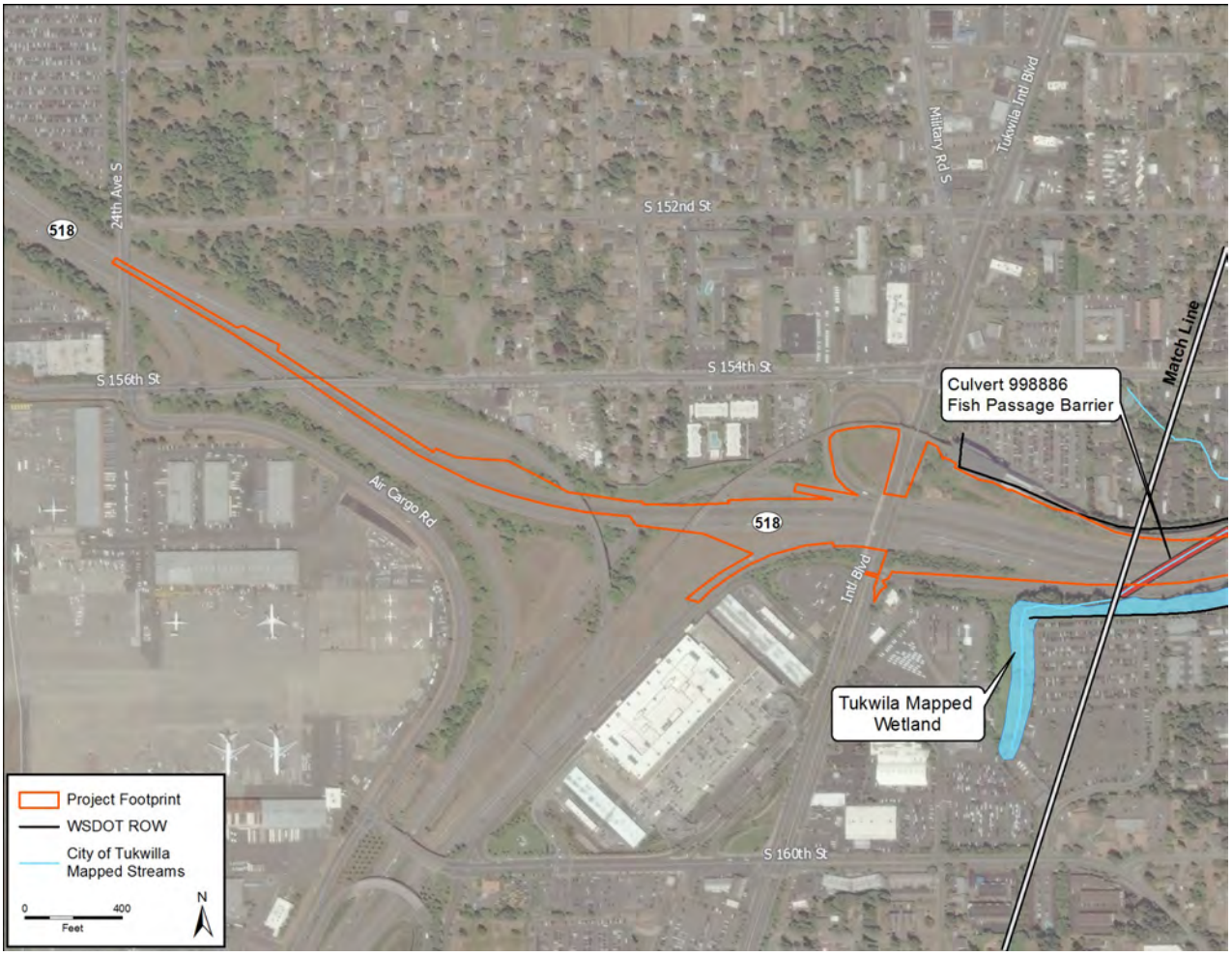
Biologists identified and delineated the boundaries of four wetlands (WTU-1, WTU-2, WTU-3, and WTU-4) within this project component footprint. Additionally, six Category IV wetlands are mapped by the City of Tukwila as occurring within 500 feet of the study area (City of Tukwila 2019).

The region received 0.75 inch of precipitation over the 10 days prior to the August 13, 2019, field investigation according to the NRCS climatological data station at Seattle-Tacoma International Airport (NRCS 2019). Overall, normal climatic conditions occurred over the three months (May 2019 to July 2019) prior to the field investigation based on the Seattle-Tacoma International Airport NRCS Climate Analysis for Wetlands Tables (WETS table) (Appendix D). Within the study area, the locations of the wetlands that were delineated, and those that are mapped by the City of Tukwila, are shown in **Figure 5-3** and **Figure 5-4**. The characteristics of the wetlands that were delineated are summarized in **Table 5-1**, and investigation photos are provided in Appendix A.

Table 5-1 Wetland characteristics, rating, and applicable buffer distances

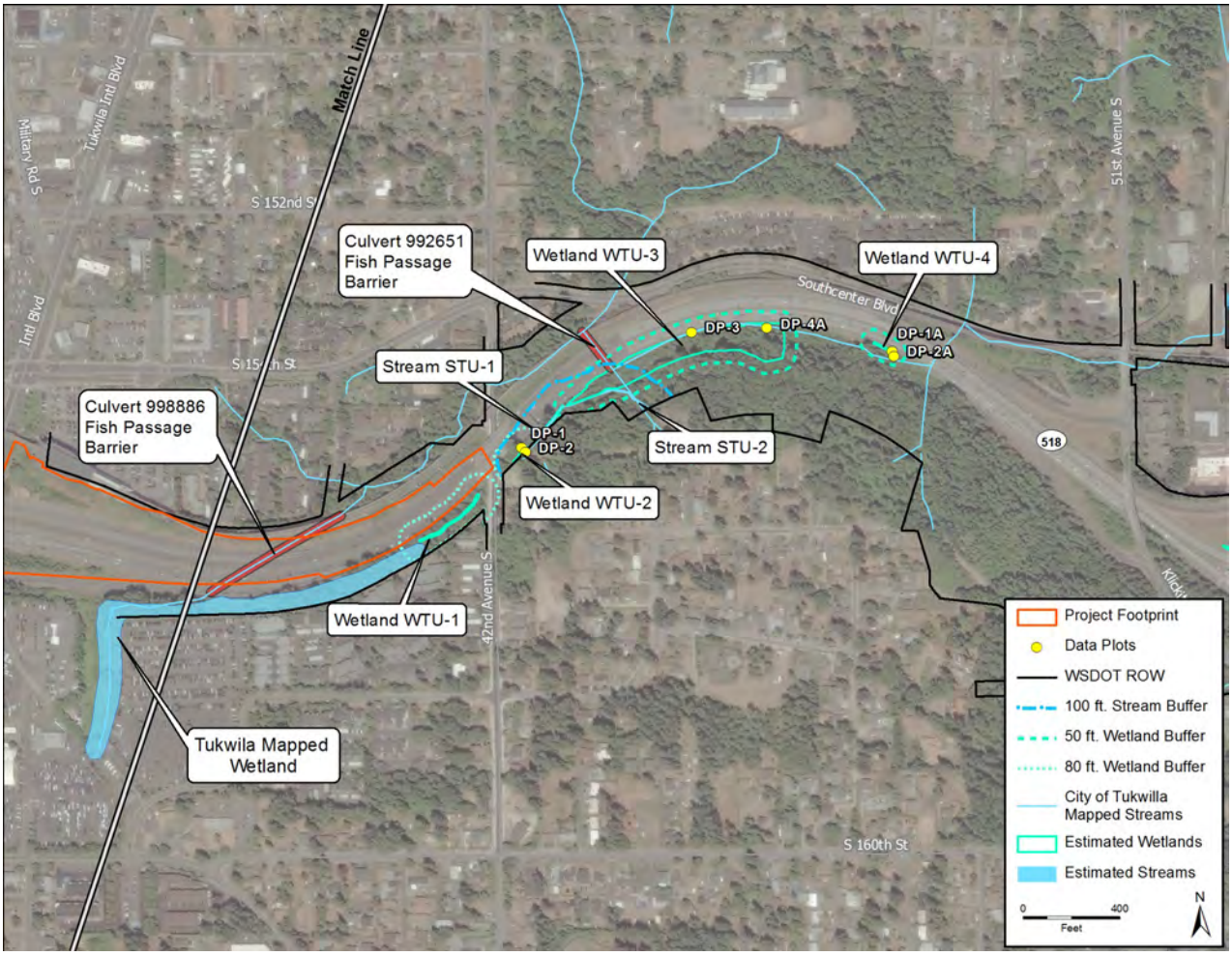
Wetland name	Estimated wetland area within the study area (acres)	HGM classification	Cowardin class[1]	Wetland location	Wetland category (2004)[2]	Wetland category (2014)[3]	Habitat score[3]	TMC required standard buffer width (feet)
WTU-1	0.06	Slope	PEM	West of 42nd Avenue S	IV	III	5	80
WTU-2	0.02	Depressional	PEM/PSS/PFO	East of 42nd Avenue S	III	III	5	80
WTU-3	2.0	Slope	PEM/PSS/PFO	East of 42nd Avenue S	IV	IV	6	50
WTU-4	0.01	Depressional	PEM	East of 42nd Avenue S	IV	IV	3	50

SOURCE: Environmental Science Associates 2020
NOTES:
[1] PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested.
[2] Based on 2004 Wetland Rating System for Western Washington (Hruby 2004) per TMC 18.45.080.B.
[3] Based on 2014 Wetland Rating System for Western Washington (Hruby 2014) per revised TMC (currently under review by the City's Department of Community Development).
HGM = hydrogeomorphic; TMC = Tukwila Municipal Code



NOTE: Culvert numbering is indicative of WDFW Fish Passage and Diversion Screening Inventory Sites (WDFW, 2019c).

Figure 5-3 West end of Tukwila International Boulevard BRT Station and Roadway Improvements study area



NOTE: Culvert numbering is indicative of WDFW Fish Passage and Diversion Screening Inventory Sites (WDFW, 2019c).

Figure 5-4 Wetlands and streams within the east end of the Tukwila International Boulevard BRT Station and Roadway Improvements study area

As shown in **Table 5-1**, wetlands within the Tukwila International Boulevard BRT Station and Roadway Improvements study area were rated using both the 2004 and 2014 versions of the Wetland Rating System for Western Washington (Hruby 2004, 2014). Per the city's current CAO, wetlands are rated and categorized using the 2004 version (TMC 18.45.080.B). However, since the current CAO was adopted in 2010, Ecology established new guidance on best available science for wetlands and now recommends the use of the 2014 version. A revised version of the CAO that requires the use of the 2014 version of the rating system is currently under review by the City's Department of Community Development and Neighborhoods and is expected to be adopted in early 2020. As the project will likely be reviewed by the City of Tukwila under the revised CAO, the wetland rating and functional analysis descriptions for each wetland below are based on the 2014 rating system. Additionally, buffers applied to each wetland and the associated analysis of buffer impacts (see Section 6.2) also use those resulting from the 2014 wetland rating system. Both the 2004 and the 2014 wetland rating forms for each wetland are included in Appendix E.

The project clearing and grading limits were completed after the wetlands were delineated. The clearing and grading limits showed that all wetlands, streams, and buffers were outside of the project footprint, so no formal survey of the delineations were completed. For this reason, the wetland boundaries discussed below are considered to be estimates. If, during final design, project changes indicate that wetland, stream, or buffer impacts are possible, delineations would be reassessed and completed if needed. If project changes indicate that ground disturbance would occur near a culvert that is currently listed on the WDFW Fish Passage and Diversion Screening Inventory, Sound Transit would coordinate with WSDOT and WDFW to determine whether mitigation is required to eliminate the fish passage barrier.

5.2.3.1 Wetland WTU-1

Overview: Wetland WTU-1 is located on a slope to the south of SR 518, west of 42nd Avenue S (see Figure 5-4 and Photos 1 and 2 [all photos associated with Figure 5-4 appear in Appendix A]). The wetland collects water from hillside seeps. During the initial site visit on August 30, 2019, this feature was originally delineated as a stream due to the presence of flowing water and low vegetation cover. Therefore, no wetland data plots were established. However, when visited again on November 23, 2019, the water had receded and vegetation was observed, which led biologists to reconsider this feature a wetland. However, additional wetland data plots were not established as the November 23, 2019, site visit was performed at a reconnaissance level. Therefore, the boundary of this wetland was also identified at a reconnaissance level. As the project design and permit process progresses, Wetland WTU-1 will be revisited and official wetland data plots will be established, as needed.

Classification: Wetland WTU-1 is a palustrine emergent (PEM) wetland using the USFWS wetland classification system (Cowardin et al. 1979) and a slope wetland based on the hydrogeomorphic (HGM) wetland classification system (Brinson 1993). It is located on a slope with unidirectional flow that leaves the wetland without being impounded.

Hydrology: Wetland hydrology indicators included the presence of surface water, including a high-water table and saturation to the surface. Hydrological inputs include uphill seeps.

Soils: Soils were not observed in the field.

Vegetation: Wetland WTU-1 is dominated by an emergent and scrub-shrub plant community that is primarily lady fern (*Athyrium filix-femina*), morning glory (*Convolvulus arvensis*), Himalayan blackberry, and salmonberry (*Rubus spectabilis*).

Wetland Rating and Functions: Wetland WTU-1 scored a total of 16 points (Category III) using Ecology's rating system (Hruby 2014, Appendix E). The water quality functions received a moderate score (6 points), and the hydrologic and habitat functions received a low score (5 points each). This slope wetland drains to Gilliam Creek, a 303(d)-listed stream in a highly urbanized system, and therefore supports water quality and hydrologic functions at the landscape level. However, the wetland lacks dense, uncut, rigid plants to reduce flooding and stream erosion. The wetland provides habitat function due to its structurally diverse vegetation and the presence of special habitat features such as downed wood and standing snags; however, the surrounding area lacks accessible and undisturbed habitat important to wildlife.

Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WTU-1 does not attenuate flood flows, remove sediment or nutrients, help control erosion, or provide fish habitat as it is a slope wetland. The wetland provides habitat for passerine bird species and small mammals; however, it is

isolated due to surrounding development and lacks a buffer. Wetland WTU-1 is seasonally inundated with emergent vegetation in the ponded areas, which may provide habitat for aquatic invertebrates; however, emergent vegetation species within the wetland is not conducive to supporting amphibian egg masses. The wetland does not provide educational or scientific value since it is in public ownership (WSDOT right-of-way) and it is not rare in the area.

5.2.3.2 Wetland WTU-2

Overview: Wetland WTU-2 is located just east of the SR 518 and 42nd Avenue S intersection (Figure 5-4 and Photos 3 and 4). DP-2 characterizes the wetland and DP-1 is representative of upland characteristics. Wetland WTU-2 is located in a depression that appears to be associated with Stream STU-2. The wetland collects water from uphill seeps east of 42nd Avenue S and south of SR 518, forming a small ponded area (approximately 30 feet long and 8 to 10 feet wide). 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.

Classification: Wetland WTU-2 is a PEM, palustrine scrub-shrub (PSS), and palustrine forested (PFO) wetland using the USFWS wetland classification system (Cowardin et al. 1979). It is a depressional wetland based on the HGM wetland classification system (Brinson 1993) as water does not leave the wetland without being impounded.

Hydrology: Wetland hydrology indicators included the presence of surface water, including a high-water table, saturation to the surface, and hydrogen sulfide odor (A1, A2, A3, and C1, respectively). The wetland was inundated during the August 2019 site visit. Hydrological inputs include uphill seeps.

Soils: Soils observed at the wetland plot were primarily sandy loam. Soils were black (10YR 2/1) from 0 to 11 inches and gray (5Y 5/1) from 11 to 18 inches. Soils met hydric soil indicator Hydrogen Sulfide (A4).

Vegetation: Wetland WTU-2 is dominated by a forested plant community that is primarily Pacific willow (*Salix lucida*), Oregon ash (*Fraxinus latifolia*), Western red cedar (*Thuja plicata*), and black cottonwood. Non-native plant species present included Himalayan blackberry and English holly (*Ilex aquifolium*).

Wetland Rating and Functions: Wetland WTU-2 scored a total of 18 points (Category III) using Ecology's rating system (Hruby 2014, Appendix E). The water quality and hydrologic functions received moderate scores (7 and 6 points, respectively), and the habitat functions received a low score (5 points). This depressional wetland contains a large area (> half its size) that seasonally ponds and is covered in persistent vegetation, which aids in retaining water and filtering pollutants. The wetland exhibits a multi-structural plant community that can provide refuge for a wide array of organisms; however, the habitat function is generally low due to the lack of accessible undisturbed habitat.

Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WTU-2 is a small depressional wetland that provides moderate flood flow alteration and sediment and nutrient removal functions. It is associated with STU-2, a potentially fish-bearing stream, and the wetland buffer provides shade and detrital matter to support a fish food base. The wetland provides habitat for passerine bird species and small mammals; however, it is isolated due to surrounding development and contains low amounts of large woody debris, an important habitat feature for amphibians. Wetland WTU-2 is

associated with a stream and is permanently and seasonally inundated with emergent vegetation in the ponded areas, which may provide habitat for aquatic invertebrates. The wetland does not provide educational or scientific value since it is in private ownership and it is not rare in the area.

5.2.3.3 Wetland WTU-3

Overview: Wetland WTU-3 is located adjacent to SR 518 approximately 230 feet northeast of Wetland WTU-2 (Figure 5-4 and Photos 5, 6, and 7). DP-3 and DP-4A characterize the wetland. Wetland WTU-3 is located on a slope that appears to collect groundwater from hillside seeps. The wetland also collects stormwater runoff from the adjacent freeway. The wetland boundary was flagged where hydrophytic vegetation, hydric soil indicators, and wetland hydrology were present.

The eastern edge and roadside portion of this wetland were delineated in the field. However, the portion of the wetland that continues upslope was estimated using visual observations, aerial imagery, and GIS data. As the design and the permit processes progress, the remaining boundary of this wetland will be formally delineated and professionally surveyed, as needed.

Classification: Wetland WTU-3 is a PEM, PSS, and PFO wetland using the USFWS wetland classification system (Cowardin et al. 1979). It is a slope wetland based on the HGM wetland classification system (Brinson 1993) as it is located on a slope with unidirectional flow that leaves the wetland without being impounded.

Hydrology: Wetland hydrology indicators included the presence of a high-water table, at a depth of 6 inches, and saturation to the soil surface (A2 and A3). Hydrogen sulfide odor was also present (C1). The wetland was inundated during the August 2019 site visit. Hydrological inputs include surface-water runoff from the adjacent freeway and groundwater seeps.

Soils: Soils observed at the wetland plot were primarily sandy loam with high organics and quarry spalls present. Soils were black (2.5Y 2.5/1) from 0 to 12 inches with a restrictive layer of quarry spalls at a depth of 12 inches. Soils met hydric soil indicator Hydrogen Sulfide (A4).

Vegetation: Wetland WTU-3 is dominated by an emergent and forested plant community that is primarily watercress (*Nasturtium officinale*), giant horsetail (*Equisetum telmateia*), and Pacific willow. Additional emergent vegetation present within the wetland includes lady fern (*Athyrium cyclosorum*) and common velvetgrass (*Holcus lanatus*).

Wetland Rating and Functions: Wetland WTU-3 scored a total of 15 points (Category IV) using Ecology's rating system (Hruby 2014, Appendix E). The water quality functions received a low to moderate score (5 points); the hydrologic functions received a low score (4 points); and habitat functions received a moderate score (6 points). This slope wetland is associated with a tributary that drains to Gilliam Creek, a 303(d)-listed stream in a highly urbanized system, and therefore supports water quality and hydrologic functions at the landscape level. The wetland has an overall low habitat function due to its lack of accessible undisturbed habitat, structurally diverse vegetation, plant diversity, and habitat features.

Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WTU-3 does not attenuate flood flows, remove sediment or nutrients, help control erosion, or provide fish habitat as it is a slope wetland. While plant species diversity is moderate, the wetland has a permanently flowing outlet to export nutrients from organic matter. This large wetland provides habitat for passerine bird species, small mammals, and amphibians as it contains emergent and woody vegetation in the seasonally

and permanently ponded areas. Wetland WTU-3 does not provide educational or scientific value since it is along SR 518 and it is not rare in the area.

5.2.3.4 Wetland WTU-4

Only the northern and eastern edges of Wetland WTU-4 were delineated using the formal delineation methods described in Section 4.3.1. The information below summarizes information recorded in the field. The remaining boundary of the wetland was conservatively estimated using methods described in Section 4.3.1.1. As the design and permit processes progress, this wetland will be revisited and formally delineated, as needed.

Overview: Wetland WTU-4 is located adjacent to SR 518 approximately 370 feet east of Wetland WTU-3 (Figure 5-4 and Photo 8). DP-1A characterizes the wetland and DP-2A is representative of upland characteristics. Wetland WTU-4 is located in a depression that appears to have been excavated out of fill material from the road prism. The wetland collects surface-water runoff from the adjacent freeway and inputs from a culvert to the south. 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.

Classification: Wetland WTU-4 is a PEM wetland using the USFWS wetland classification system (Cowardin et al. 1979) and a depressional wetland based on the HGM wetland classification system (Brinson 1993) as water does not leave the wetland without being impounded.

Hydrology: Wetland hydrology indicators included the presence of a high groundwater table, at a depth of 5 inches, and saturation to the soil surface (A2 and A3, respectively). Hydrogen sulfide odor was also present (C1). Hydrological inputs include surface-water runoff from the adjacent freeway and inputs from a culvert. The water source for the culvert inputs was not identified in the field and the culvert is not mapped.

Soils: Soils observed at the wetland plot were primarily sandy loam with high organics and quarry spalls present. Soils were black (10YR 2/) from 0 to 1 inches with a restrictive layer of quarry spalls at a depth of 1 inch. Soils met hydric soil indicator Hydrogen Sulfide (A4).

Vegetation: Wetland WTU-4 is dominated by an emergent plant community that is primarily watercress, common rush (*Juncus effusus*), and common velvetgrass.

Wetland Rating and Functions: Wetland WTU-4 scored a total of 15 points (Category IV) using Ecology's rating system (Hruby 2014, Appendix E). The water quality and hydrologic functions received moderate scores (6 points each), and the habitat functions received a low score (3 points). The wetland has a permanently flowing outlet and little vegetation, which result in a low residence time to filter pollutants; however, the wetland is upslope of Gilliam Creek, a 303(d)-listed stream in a highly urbanized system and therefore supports water quality and hydrologic functions at the landscape level. The wetland has an overall low habitat function due to its lack of structurally diverse vegetation, low plant diversity, and lack of habitat features.

Using WSDOT's functional analysis tool (Null et al. 2000), Wetland WTU-4 is a small depressional wetland that contains one Cowardin class so it is generally unsuitable for habitat. It receives stormwater runoff from the adjacent SR 518 and provides moderate flood flow alteration and sediment and nutrient removal functions. Wetland WTU-4 does not provide educational or scientific value since it is along SR 518 and it is not rare in the area.

5.2.3.5 Additional wetlands within the study area

The City of Tukwila maps a large wetland located south of SR 518 and east of International Boulevard (**Figure 5-3** and **Figure 5-4**). This mapped feature continues east along the south side of SR 518 and behind a retaining wall. The portion of this area immediately west of Wetland WTU-1 was walked in the field at a reconnaissance level and appeared to have more stream characteristics than wetland characteristics (see Section 5.2.4.3). However, because no ground-disturbing activities are proposed in this area, the majority of this mapped feature was not visited in the field; therefore, wetland conditions were not verified.

5.2.4 Streams

Several streams occur in the Tukwila International Boulevard BRT Station and Roadway Improvements study area and form the headwaters of Gilliam Creek (WRIA 09.0032), a tributary to the Duwamish/Green River (WDFW 2019c). Several branches of Gilliam Creek occur to the south of the eastbound SR 518 on-ramp from Tukwila International Boulevard, where they combine and flow parallel to the ramp for approximately 350 feet before entering a 36-inch-diameter culvert. This culvert extends approximately 900 feet downstream (northeast) under the lower end of the SR 518 on-ramp and both the east and westbound lanes of SR 518 before discharging to a riparian corridor adjacent to SR 518 near 40th Avenue S (City of Tukwila 2013). Gilliam Creek then flows primarily through open stream channels on the north side of SR 518 for approximately 0.9 mile before entering a 54-inch-diameter culvert near 52nd Avenue S. This culvert flows for approximately 0.5 mile under the I-5/I-405 interchange and discharges to an area between the northbound I-5 off-ramp to eastbound I-405 and Tukwila Parkway. The creek then flows an additional 0.5 mile to the Green River. While these portions of Gilliam Creek are believed to contain suitable habitat for some anadromous salmonid species (particularly coho salmon, steelhead, and sea-run cutthroat trout), the lengthy culverts in the lower reaches, particularly the 0.5-mile-long culvert under the I-5/I-405 interchange, are considered complete barriers to fish passage per the WDFW Fish Passage and Diversion Screening Inventory (WDFW 2019c). However, resident fish species (including resident trout) are likely to occur in the upstream portions of Gilliam Creek, and therefore are considered Type 2 (F) waters with a corresponding 100-foot buffer requirement per TMC 18.45.100.C.

Two unnamed tributary streams to Gilliam Creek were found and surveyed in the Tukwila International Boulevard BRT Station and Roadway Improvements study area. These streams are located immediately south of SR 518, near 42nd Avenue S. (Figure 5-4). Both of these streams (STU-1 and STU-2) are located east of 42nd Avenue S. These tributary streams appear to originate from groundwater seeps from the hillside south of SR 518, and generally flow parallel to the highway to reach culverts. While the culvert outlets could not be determined, it is expected that they extend under the highway and eventually discharge to Gilliam Creek, which parallels the north side of the highway. The culverts are not fish passable, and no fish were observed in any of the surveyed reaches. However, both streams are conservatively assumed to be potential fish-bearing waters (Type F) due to the apparent perennial flows and overall habitat characteristics and are allotted a 100-foot buffer per TMC 18.45.100.C.

5.2.4.1 Stream STU-1

Stream STU-1 is fed by uphill seeps east of 42nd Avenue S and south of SR 518, forming a small ponded area (approximately 30 feet long and 8 to 10 feet wide) delineated as Wetland WTU-2. From this ponded area, the stream flows northeast through a depressional forested area between the hillside to the south and the highway road prism to the north. Riparian vegetation consisted primarily of red alder and western red cedar trees, providing between 70 and 95 percent canopy cover (Figure 5-4, Photo 12). The stream channel consists mostly of riffle-run habitat, with a BFW ranging from 3 to 6 feet, and substrate consisting primarily of small (2- to 6-inch) quarry spalls and silt. The stream flows east along the highway for about 300 feet to a 54-inch-diameter overflow (standpipe) culvert (Figure 5-4, Photo 13). This culvert flows north under SR 518 and discharges to Gilliam Creek. The culvert (Culvert 992651) is identified by WDFW as a total fish passage barrier (WDFW 2019c).

5.2.4.2 Stream STU-2

Stream STU-2 flows from the hillside south of SR 518 to the same 54-inch-diameter overflow standpipe culvert as Stream STU-1 (Culvert 992651). The stream generally flows east to west along the hillside on what appears to be a constructed bench, uphill from the highway road prism (Figure 5-4, Photo 14). The stream is similar in size to Stream STU-1 (3- to 7-foot-wide BFW), and primarily riffle-run habitat, with a relatively dense overhead canopy provided primarily by alder and willow species. However, the substrate was more natural, consisting primarily of sand and silt, with some gravel patches. The stream was surveyed for approximately 300 linear feet upstream. The stream gradually traversed the hillside until a steeper inflection point located approximately 40 feet south of SR 518.

5.2.4.3 Additional streams within the study area

The City of Tukwila maps an unnamed stream beginning in the city-mapped wetland (discussed in Section 5.2.3.5), south of SR 518 and east of International Boulevard (**Figure 5-3** and **Figure 5-4**). The stream is mapped as flowing north toward SR 518, then flows east along the south side of SR 518 for approximately 200 feet before entering a culvert and crossing under SR 518. According to WDFW, this culvert (Culvert 998886) is a fish passage barrier (WDFW 2019c). The stream then flows northwest and into the Gilliam Creek System. This stream was not visited during the field effort as no ground-disturbing activities are proposed in the area.

An additional unmapped, unnamed stream was observed flowing west to east, to the west of Wetland WTU-1, during the November 23, 2019 site visit. However, because this site visit was performed at a reconnaissance level, the OHWM of this stream was not flagged. The stream enters a culvert and flows north under SR 518; it does not flow into Wetland WTU-1. It is assumed that this stream also enters the Gilliam Creek System on the north side of SR 518, likely near the outlet of Culvert 998886 and the city-mapped stream to the west (**Figure 5-3** and **Figure 5-4**).

5.2.5 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, no federal or state-listed animals occur within the study area (WDFW 2019a). The closest known occurrence is Gilliam Creek, approximately 0.6 mile east of the project footprint. State-protected species within Gilliam Creek include cutthroat trout and

coho salmon (WDFW 2019b). Additionally, according to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur within the study area (WDNR 2019). No additional FWHCAs, as defined by TMC 18.45.150, were observed as occurring within the study area. As shown in **Figure 5-4**, two fish passage barriers (Culverts 992651 and 998886) have been identified by WDFW within the east end of this project component.

5.2.6 Tree assessment

All trees in the Tukwila International Boulevard BRT Station and Roadway Improvements study area are located along the south side of SR 518 in WSDOT right-of-way and are Category 2 trees by WSDOT's definition. A total of 10 trees with a dbh of 4 inches or greater were observed or identified in the study area, as detailed in **Table 5-2**.

Table 5-2 WSDOT Category 2 Trees within the Tukwila International Boulevard BRT Station and Roadway Improvements study area

Species	Common name	Number of trees observed or identified
Acer macrophyllum	Bigleaf maple	3
Alnus rubra	Red alder	2
Populus balsamifera	Black cottonwood	1
Populus tremuloides	Quaking aspen	1
Pseudotsuga menziesii	Douglas fir	1
Unknown[1]	Unknown	2
	Total	10

SOURCE: ESA 2020
NOTE: [1] Based on aerial imagery, two Category 2 trees appear to be present within the project component area.

5.3 South Renton Transit Center and Roadway Improvements

5.3.1 Study area

The South Renton Transit Center and Roadway Improvements study area is located in the City of Renton in King County. The project footprint is bordered by the SR 167 southbound off-ramp to the south, SR 167 to the west, and the SR 167 northbound off-ramp to the north and northeast. The project footprint continues north along the east side of SR 167 and includes the proposed site of the South Renton Transit Center immediately northeast of the intersection with Grady Way (**Figure 5-5**). The study area includes the area within 500 feet of the project footprint and is located within the Green River subwatershed within WRIA 9: Duwamish – Green.

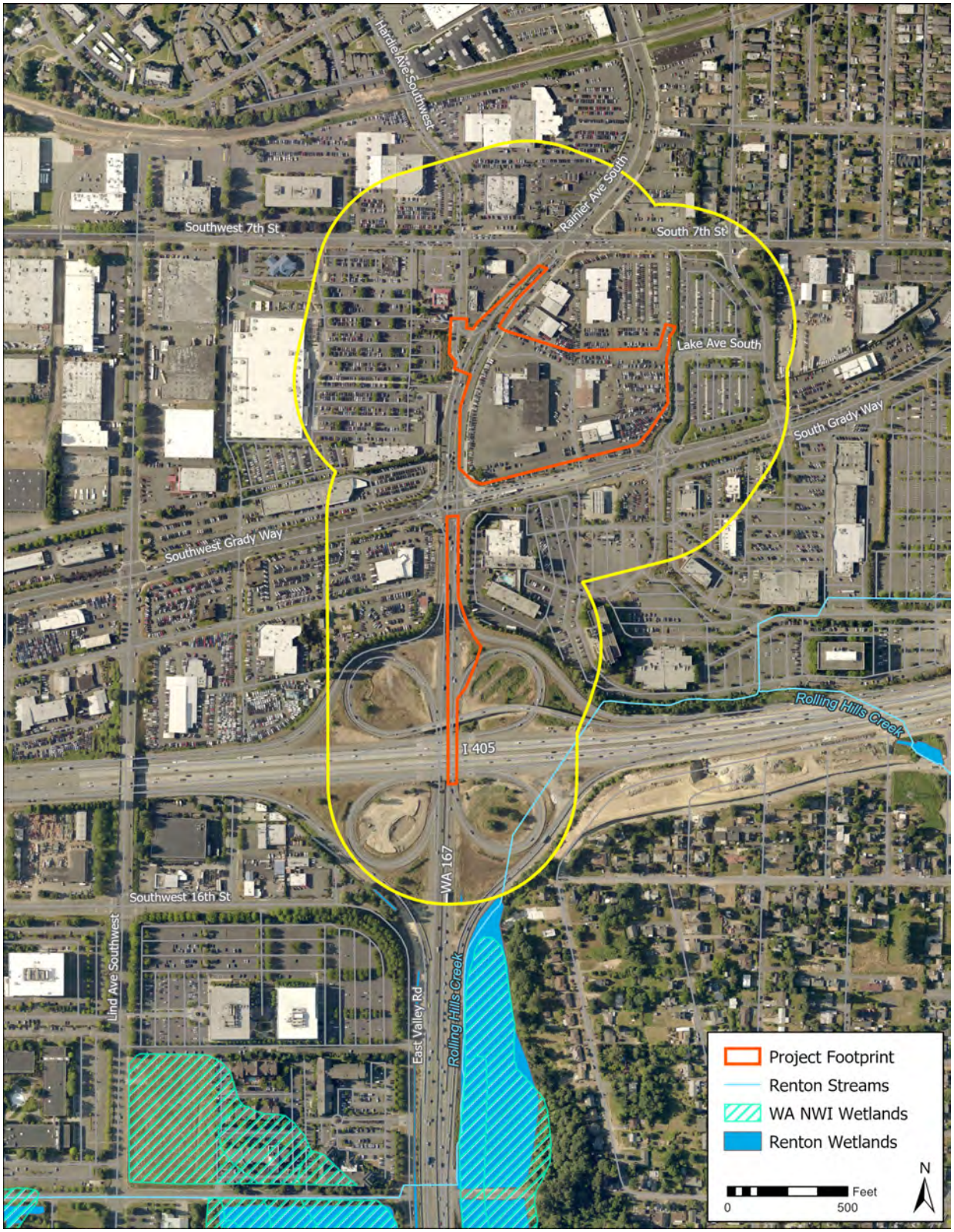


Figure 5-5 South Renton Transit Center and Roadway Improvements study area

5.3.2 Habitat description

The South Renton Transit Center and Roadway Improvements study area is located in a highly developed urban environment that is primarily buildings and roads. Little vegetation is present and is limited to street trees and landscaping along Rainier Avenue S and S Grady Way.

Wildlife species in the study area likely include birds (e.g., American robin, American crow, and common pigeon) 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 in the study area.

5.3.3 Wetlands and streams

No wetlands or streams were observed in the study area during the field investigation. Additionally, no wetlands are mapped as occurring within the study area (King County 2020; USFWS 2019).

One stream (Rolling Hills Creek) is mapped as occurring within 500 feet of the study area running parallel to the Rainier Avenue S exit along the south boundary of the property at 25 S Grady Way (City of Renton 2019). This stream flows southwest through the I-405/SR 167 interchange area in a 48-inch-diameter culvert. The stream then flows south through the Panther Creek wetland complex along the east side of SR 167 before flowing west and discharging into the Springbrook Creek/Black River system approximately 0.5 mile west of SR 167 (WDFW 2019b).

5.3.4 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, no federal or state-listed animals occur within 500 feet of the study area (WDFW 2019a). The closest known occurrence is Springbrook Creek within a wetland complex along SR 167, approximately 0.5-mile south of the study area. Listed species within Springbrook Creek include federally listed Chinook salmon and steelhead trout, as well as state-protected cutthroat trout, coho salmon, and chum salmon (WDFW 2019b). However, Chinook and steelhead have not been documented within Springbrook Creek and only have a modeled presence due to an accessible gradient. The closest documented ESA-listed species is an additional 0.5-mile downstream within the Black River (WDFW 2020). Additionally, according to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur within 500 feet of the study area (WDNR 2019). No additional Habitat Conservation Areas, as defined by Renton Municipal Code 4-3-050G.6, were observed as occurring within the study area.

5.3.5 Tree assessment

While the City of Renton currently does not have a tree protection code or a definition of what the city considers to be a significant tree, trees 4 inches or greater dbh were identified, consistent with WSDOT's definition of a Category 2 tree. Within City of Renton rights-of-way, a total of 14 trees with a dbh of 4 inches or more were identified within the South Renton Transit Center and Roadway Improvements study area, as detailed in **Table 5-3**. An additional 20 Category 2 trees were identified within WSDOT right-of-way based on aerial imagery. The majority of the trees identified within the study area are located on the northeast side of the I-405 south off-ramp to SR 167 within WSDOT right-of-way.

Table 5-3 Trees within the South Renton Transit Center and Roadway Improvements study area

Species	Common name	Number of trees observed or identified
Populus nigra	Lombardy poplar	4
Acer sp.	Maple species	8
Pinus sp.	Pine species	1
Robinia pseudoacacia	Black locust	1
Unknown[1]	Unknown	20
	Total	34

SOURCE: ESA 2020
NOTE: [1] Based on aerial imagery, 20 Category 2 trees appear to be present within the project component area.

5.4 Bellevue Transit Center and Off-site Layover

5.4.1 Study area

The Bellevue Transit Center study area is located at the existing Bellevue Transit Center in the City of Bellevue, King County, Washington. The project footprint includes bus bays 5, 6, and 7 to the east of 108th Avenue NE (**Figure 5-6**). The assessed project footprint does not include the bus layover area to the north as no ground-disturbing activities will occur there. The study area includes the area within 500 feet of the project footprint and is located within the Lake Washington-Sammamish River subwatershed within WRIA 8: Cedar - Sammamish.

5.4.2 Habitat description

The Bellevue Transit Center study area is located in a highly developed urban environment that consists primarily of buildings and roads. Little vegetation is present and is limited to street trees and landscaping along the Bellevue Transit Center access road.

Wildlife species in the study area likely include birds (e.g., American robin, American crow, and common pigeon) 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 in the study area.

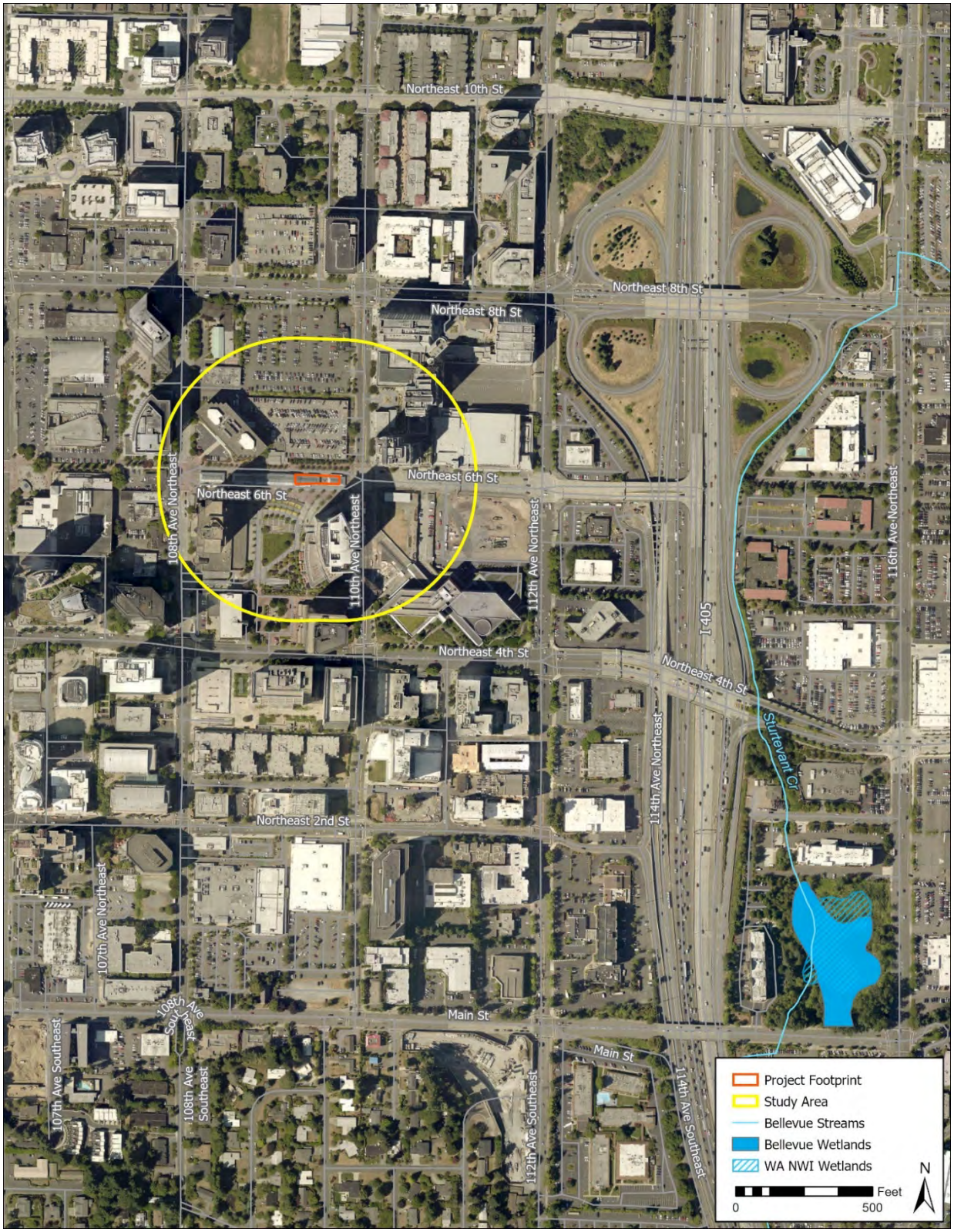


Figure 5-6 Bellevue Transit Center study area

5.4.3 Wetlands and streams

No wetlands or streams were observed within the project footprint during the field investigation. Additionally, no wetlands or streams are mapped as occurring within the study area (King County 2020; USFWS 2019). The closest mapped stream is Sturtevant Creek east of I-405, approximately 0.3 mile east of the project footprint (King County 2020). Sturtevant Creek flows south into Mercer Slough before entering Lake Washington approximately 2.5 miles south of the project footprint. The closest wetland is mapped as occurring at the northwest corner of Main Street and 116th Avenue SE, approximately 0.8 mile southeast of the project footprint near the headwaters of Mercer Slough (King County 2020).

5.4.4 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, no federal or state-listed animals occur within the study area (WDFW 2019a). The closest known occurrence is Sturtevant Creek, approximately 0.3 mile east of the project footprint, on the east side of I-405. Listed species within Sturtevant Creek include federally listed Chinook salmon and steelhead trout, as well as state-protected coho salmon and sockeye salmon (*Oncorhynchus nerka*) (WDFW 2019b). According to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur within the study area (WDNR 2019). No additional habitat for species of local importance, as defined by Bellevue Land Use Code 20.25H.150, were observed as occurring within the study area.

5.4.5 Tree assessment

BMC 20.50.046 defines a significant tree to be “a healthy evergreen or deciduous tree, eight inches in diameter or greater, measured 4 feet above existing grade.” No significant trees were observed in the study area. Several street trees are located along the north and south sides of NE 6th Street. However, these trees were not included in the assessment of impacts within the project footprint because the construction impacts of modifying the existing bus bay are anticipated to be isolated from these trees.

5.5 Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage

5.5.1 Study area

The Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage project footprint is located within the existing Kingsgate Park-and-Ride (Tax Parcel 2926059005) on 116th Way NE between NE 128th Street and NE 132nd Street in the City of Kirkland in King County (**Figure 5-7**). The study area includes the area within 500 feet of the project footprint and is located within the Lake Washington-Sammamish River subwatershed within WRIA 8: Cedar - Sammamish.

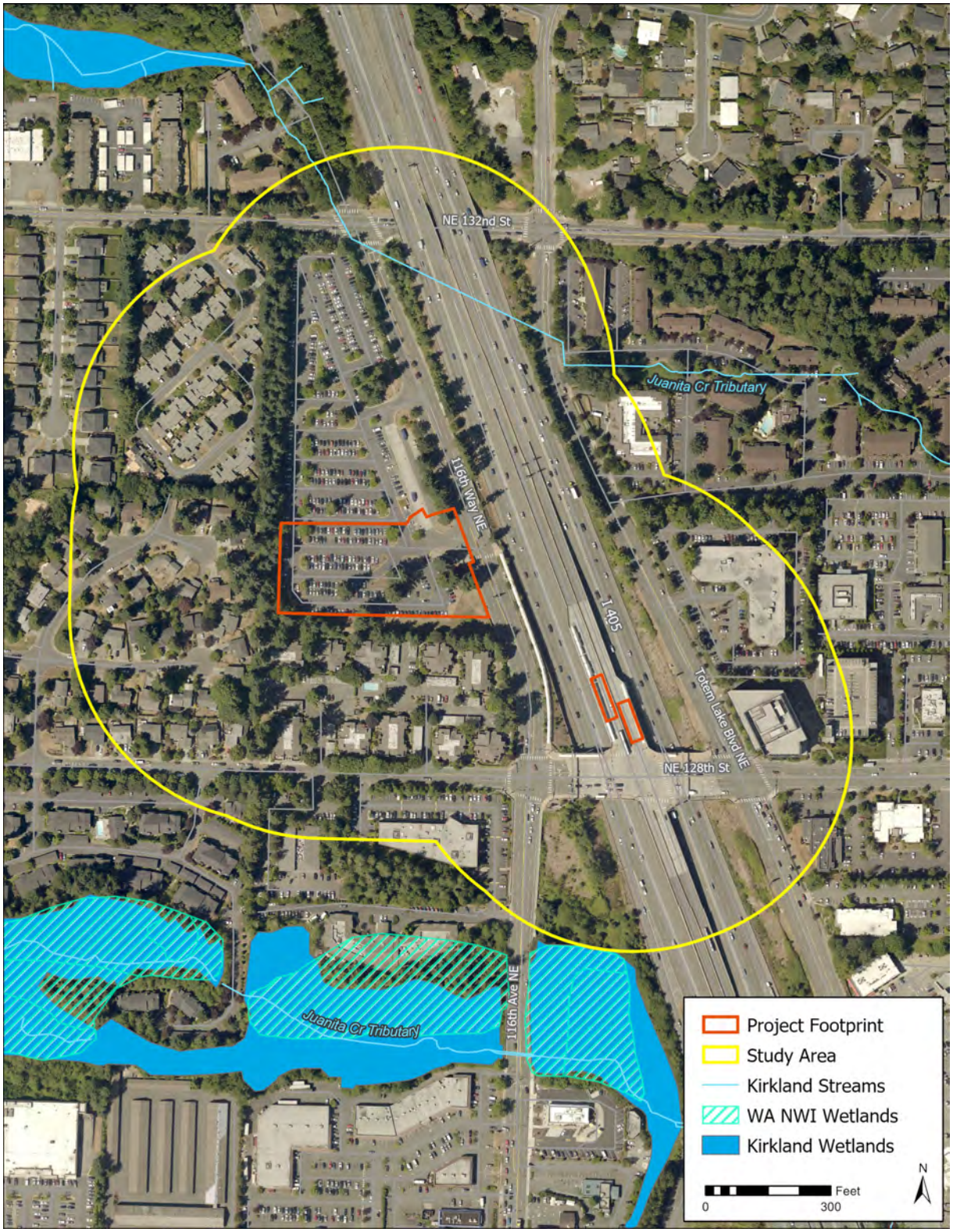


Figure 5-7 Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage study area

5.5.2 Habitat description

The Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage study area is located in a highly developed urban environment that is primarily buildings, roads, and the existing Kingsgate Park-and-Ride parking lot. Vegetation is limited to street trees and landscaping along 116th Way NE. Large, established coniferous trees, such as Douglas fir, are also present within and surrounding the park-and-ride.

5.5.3 Wetlands and streams

No wetlands or streams were observed within the project footprint during the field investigation. A man-made stormwater pond is present in the southeast corner of the park-and-ride, just east of the project footprint. Additionally, no wetlands are mapped as occurring within the study area (King County 2020; USFWS 2019). One stream, an unnamed tributary to Juanita Creek, is mapped as occurring at the 116th Way NE and NE 132nd Street intersection, approximately 380 feet north of the project footprint (City of Kirkland 2020; King County 2020). It is entirely piped through the study area and considered a total fish passage blockage (WDFW Culvert 992654; WDFW 2019c). The closest wetlands are mapped as occurring along each of the unnamed tributaries to Juanita Creek, approximately 0.2 mile both to the north and to the south of the project footprint (USFWS 2019).

5.5.4 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, no federal or state-listed animals occur within the study area (WDFW 2019a). The closest known occurrence is the open-channel portion of the unnamed tributary to Juanita Creek, approximately 0.3 mile northwest of the project footprint, north of NE 132nd Street. This tributary flows northwest entering Juanita Creek just north of the 108th Avenue NE and NE 134th Street intersection. Juanita Creek enters Lake Washington approximately 1.7 miles southwest of the confluence. Listed species within the Juanita Creek tributary include state-protected coho salmon and resident coastal cutthroat (WDFW 2019b). According to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur within the study area (WDNR 2019). No additional Fish and Wildlife Habitat Conservation Areas, as defined by KZC 90.95, were observed as occurring within the study area.

Moderate and high landslide susceptibility areas are mapped as occurring along the edges of the study area (City of Kirkland 2020). A large seismic area is also mapped by the city as occurring along the unnamed tributary to Juanita Creek, south of the study area.

5.5.5 Tree assessment

The City of Kirkland defines a significant tree as being at least 6 inches dbh (KZC 95.10.14). Using this definition, a total of 17 significant trees were identified within the Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage study area, as detailed in **Table 5-4**. Since this study area, including the Kingsgate Park-and-Ride site, is also WSDOT right-of-way, WSDOT's policy definition is also applicable. All identified significant trees are located along the southern and southeastern perimeter of the existing park-and-ride lot and are Category 2 trees by WSDOT's policy definition.

Table 5-4 City of Kirkland Significant Trees/WSDOT Category 2 Trees within the Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage study area

Species	Common name	Number of trees
Pseudotsuga menziesii	Douglas fir	13
Sorbus aucuparia	European mountain ash	2
Unknown[1]	Unknown	2
	Total	17

SOURCE: ESA 2020
NOTE: Based on aerial imagery, two Category 2 trees appear to be present within the project component area.

5.6 Brickyard Station and Roadway Improvements

5.6.1 Study area

The Brickyard Station and Roadway Improvements project footprint is located along I-405 from the SR 522 interchange in the City of Bothell, south to approximately NE 140th Street in the City of Kirkland in King County (**Figure 5-8**). The study area includes the area within 500 feet of the project footprint and is located within the Lake Washington-Sammamish River subwatershed within WRIA 8: Cedar - Sammamish.

5.6.2 Habitat description

The Brickyard Station and Roadway Improvements study area is located in a highly developed urban environment that consists primarily of buildings and roads. Two forested habitat patches exist on either side of I-405 on the north end of the study area from the I-405/SR 522 interchange south to the NE 160th Street exit. These forested patches contain large deciduous and coniferous trees, such as Douglas fir and big leaf maple. Additionally, the riparian and wetland habitats in the study area that are associated with the Sammamish River and Juanita Creek provide important habitat for many aquatic and terrestrial wildlife species.

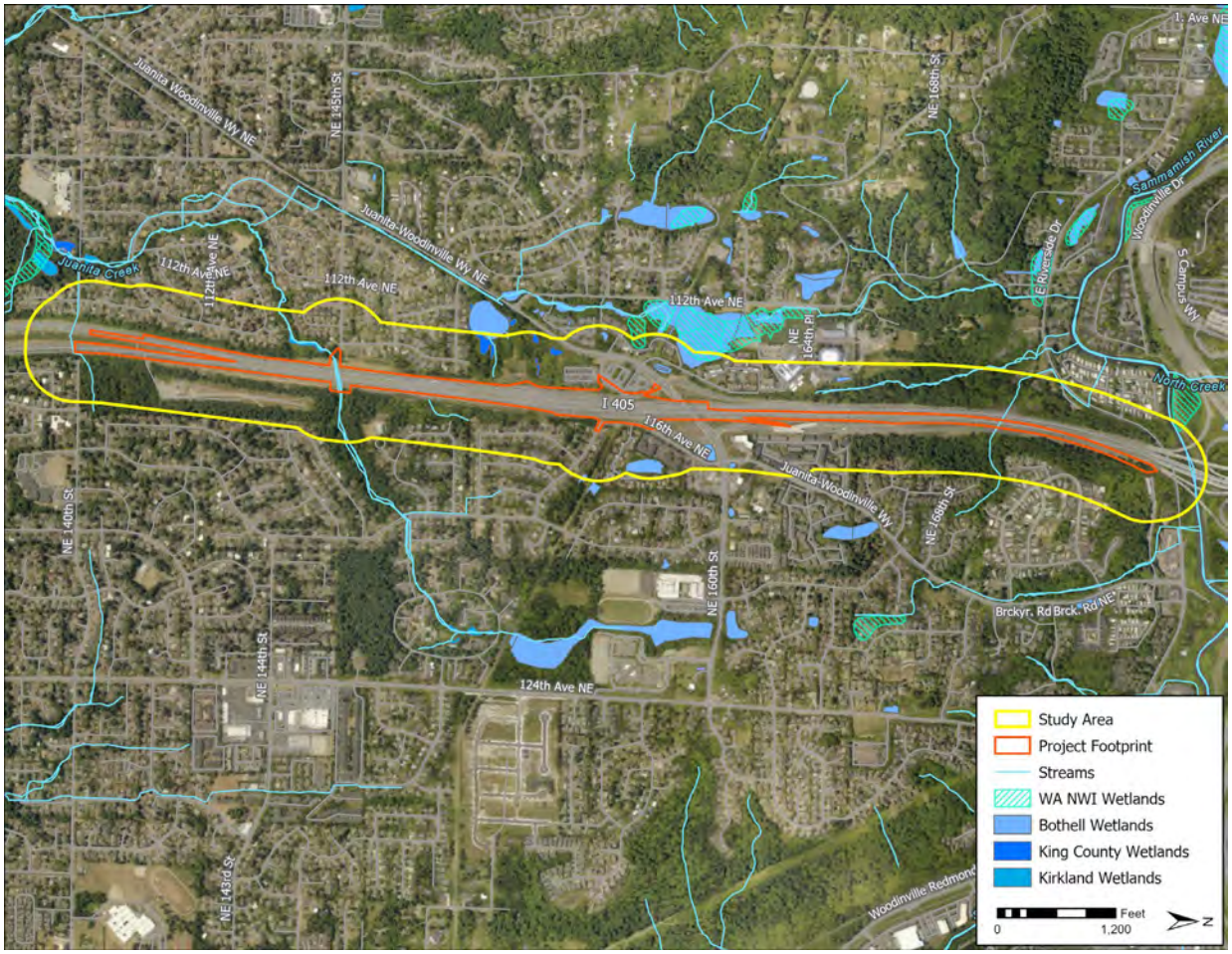


Figure 5-8 Brickyard Station and Roadway Improvements study area

5.6.3 Wetlands

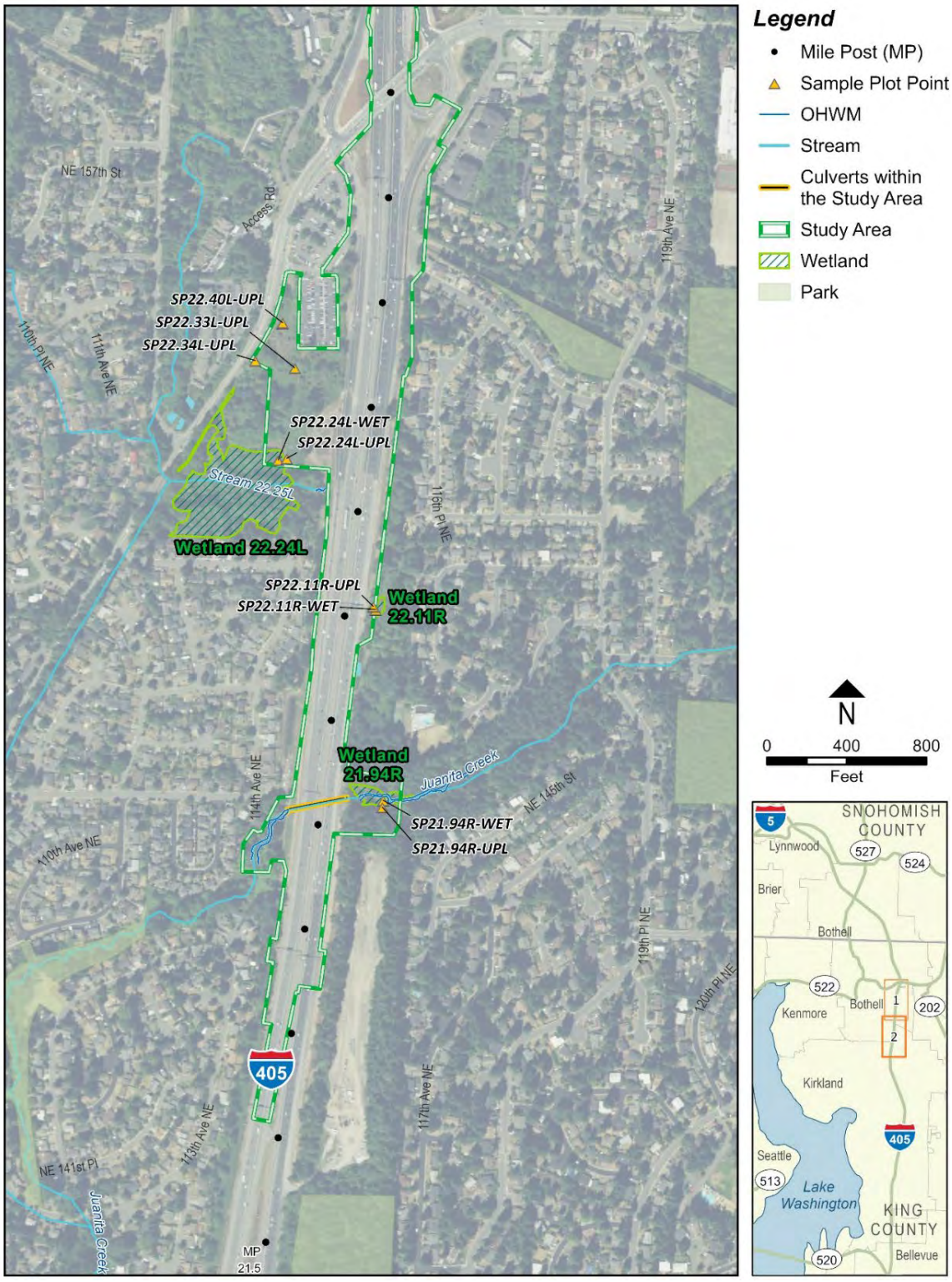
Multiple wetlands associated with Juanita Creek and its tributaries are mapped as occurring west of I-405 within the study area (City of Bothell 2020; City of Kirkland 2020; King County 2020). The wetland complex mapped west of I-405 near the Juanita Woodinville Way NE overpass appears to be the headwater to a Juanita Creek tributary and a Sammamish River tributary based on topography (City of Bothell 2020). Additionally, multiple isolated wetlands are mapped as occurring east of I-405 near the Juanita Woodinville Way NE overpass (City of Bothell 2020). WSDOT biologists formally delineated three wetlands within the project footprint during separate field investigations, which supplement the desktop analysis conducted for the I-405 BRT Project. These field efforts were only conducted in the southern portion of the Brickyard Station and Roadway Improvements study area. Surveys were conducted from the southern terminus north, to approximately 400 feet north of the Juanita Woodinville Way NE crossing. A summary of the three delineated wetlands is presented in **Table 5-5** and their locations are shown in **Figure 5-9**. Two of the wetlands (Wetlands 21.94R and 22.11R) were delineated as part of WSDOT's *SR 522 Vicinity to SR 527 Express Toll Lanes Improvement Project* in March 2019. Wetland 22.24L and the eastern portion of Wetland 21.94R were delineated on November 13, 2019.

Table 5-5 Wetlands delineated by WSDOT in the Brickyard Station and Roadway Improvements study area

Wetland[a]	Wetland Classification/Rating					Total Wetland Size (acres)	Wetland Size in the Study Area (acres)	Buffer Width (feet)[e]
	Cowardin[b]	HGM	Ecology Rating[c]	Local Jurisdiction	Local Jurisdiction Rating[d]			
21.94R	PSS/PFO	Riverine	III	Kirkland	III	0.32	0.30	105
22.11R	PSS	Depressional	III	Kirkland	III	0.07	0.00	60
22.24L	PSS/PFO	Depressional	III	Bothell	III	4.88	0.15	75
Total						**5.27**	**0.45**	**–**

SOURCE: WSDOT
NOTES:
a Wetlands listed from south to north.
b Cowardin et al. (1979) or National Wetlands Inventory class based on vegetation: PSS = palustrine scrub-shrub; PFO = palustrine forested.
c Ecology rating according to Hruby (2014).
d Wetlands rated according to City of Kirkland Wetlands Ordinance described in KZC 90.55 and City of Bothell Wetlands Ordinance described in Bothell Municipal Code (BMC) 14.04.500.
e Wetland buffer width according to City of Kirkland Wetlands Ordinance described in KZC 90.55 and City of Bothell Wetlands Ordinance described in BMC 14.04.530(F)1.

According to WSDOT *I-405 Brickyard Park-and-Ride Inline Freeway Station BRT Project Paving Plan 5% Conceptual Design Plans* (WSDOT 2019b) plan sheets, an additional wetland is located approximately 600 feet north of the Juanita Woodinville Way NE crossing, adjacent to the west side of I-405. Information on this wetland has not been received from WSDOT and, therefore, has not been included in this version of the technical memorandum. However, according to the 5% design, no ground disturbance would occur near any mapped wetlands to the west. WSDOT also maps additional wetlands in the northern portion of the project footprint, south of the Sammamish River crossing. However, similar to the other wetlands delineated by WSDOT, these wetlands appear to be outside of the project footprint when assessing the project plans.



SOURCED: WSDOT

Figure 5-9 Locations of wetlands delineated by WSDOT in the Brickyard Station and Roadway Improvements study area

5.6.4 Streams

The Sammamish River is mapped flowing east to west within the study area near the I-405/SR 522 interchange (City of Bothell 2020; King County 2020). Two tributaries to the Sammamish River are mapped as occurring within the study area (City of Bothell 2020). One of these tributaries begins near the NE 168 Street dead end and flows northwest under I-405, and the other tributary begins on the north side I-405, near 164th Place between Cedar Park Church and I-405, and flows northwest (City of Bothell 2020).

Juanita Creek is mapped flowing east to west within the study area crossing under I-405 approximately 0.65-mile south of the Juanita Woodinville Way NE overpass (City of Bothell 2020; City of Kirkland 2020; King County 2020). As described in Section 5.6.3, a tributary to Juanita Creek begins within the wetland complex west of the Juanita Woodinville Way NE overpass. The tributary flows south entering Juanita Creek just south of the 110th Avenue NE and NE 143rd Street intersection in the City of Kirkland (City of Kirkland 2020).

5.6.5 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, federal and state-listed fish species occur within the Sammamish River and Juanita Creek within the study area (WDFW 2020a). The Sammamish River flows west from the study area for approximately 4 miles before draining to Lake Washington. Juanita Creek flows southwest through Kirkland and drains to Lake Washington in Juanita Bay. Listed species within the Sammamish River and Juanita Creek include federally listed steelhead trout, sockeye salmon, and Chinook salmon and state-protected cutthroat trout and coho salmon (WDFW 2020b). Additionally, according to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur within the study area (WDNR 2020).

5.6.6 Tree assessment

A tree assessment has not been performed by Sound Transit. However, as described in Section 5.6.2, two forested habitat patches exist on either side of I-405 on the north end of the study area from the I-405/SR 522 interchange south to the NE 160th Street exit. These forested patches appear to contain Category 2 trees as defined by WSDOT, primarily large deciduous and coniferous trees, such as Douglas fir and big leaf maple.

5.7 Lynnwood City Center Transit Station BRT and Roadway Improvements

5.7.1 Study area

The Lynnwood City Center Transit Station BRT and Roadway Improvements study areas are located in the City of Lynnwood in Snohomish County. This project component has two elements. The first is the existing Lynnwood City Center transit center located south of 200th Street SW between 46th Avenue W and 48th Avenue W (**Figure 5-10**), and the second is the I-5 north on-ramp at 196th Street SW and Poplar Way (**Figure 5-11**), approximately 0.7 mile to the northeast. The study area includes the area within 500 feet of the project footprint and is located within the Swamp Creek subwatershed within WRIA 8: Cedar - Sammamish.

Figure 5-10 Lynnwood City Center Transit Station BRT and Roadway Improvements: Transit center study area

Figure 5-11 Lynnwood City Center Transit Station BRT and Roadway Improvements: Poplar Way Roadway Improvements study area

5.7.2 Habitat description

The Lynnwood City Center Transit Stations BRT and Roadway Improvements study areas are located in a highly developed urban environment that consists primarily of buildings and roads. Little vegetation is present and is limited to street trees and landscaping within the study area.

5.7.3 Wetlands and streams

No wetlands or streams were observed within the project footprint during the field investigation. A large wetland complex and multiple streams with associated wetlands are mapped as occurring within the study area (Snohomish County 2019; USFWS 2019). Scriber Creek and associated wetlands run northwest to southeast, and are located immediately southwest of the Lynnwood City Center transit center parking area and Interurban Trail (City of Lynnwood 2016; Snohomish County 2019). A left bank tributary and associated wetland to Scriber Creek are mapped as occurring on the west side of the transit center parking area. The stream is either entirely piped or shortened and rerouted to the vegetated area to the southeast, between the transit center parking lot and the I-405 on-ramp. The closest mapped streams and associated wetlands to the I-5 north on-ramp are Poplar Creek, which is piped under the residential area to the southwest near Birch Way, and Golde Creek, which runs north to southeast of the study area (City of Lynnwood 2016; Snohomish County 2019).

5.7.4 Fish and Wildlife Habitat Conservation Areas

According to the WDFW PHS data, no federal or state-listed animals occur within the project footprint (WDFW 2019a). The closest known occurrence is Scriber Creek, approximately 480 feet to the west. Golde Creek and Poplar Creek are tributaries to Scriber Creek. Scriber Creek flows southeast through the City of Brier entering Swamp Creek just north of Cypress Way, approximately 600 feet northwest of the Cypress Way and Locust Way intersection in unincorporated Snohomish County. Swamp Creek continues southeast into King County draining to the Sammamish River in the City of Kenmore. The Sammamish River flows west from that point for approximately 0.75 mile before entering Lake Washington. Listed species within Scriber Creek include state-protected and resident coastal cutthroat within the study area (WDFW 2019b). Additionally, there is a biodiversity area and corridor at Scriber Lake Park, approximately 0.3 mile northwest of the study area (WDFW 2019a). According to the WDNR Natural Heritage Program mapping, no federally or state-listed plant species occur within the study area (WDNR 2019).

No additional fish and wildlife priority habitats, as defined by Lynnwood Municipal Code 17.10.090, were observed as occurring within the study area.

5.7.5 Tree assessment

Based on aerial imagery, within WSDOTs right-of-way for the Poplar Way Loop Ramp that is proposed for construction staging, an estimated 15 WSDOT Category 2 trees (between 4 and 30 inches in diameter) may be present.

Per LMC 17.15.080, the City of Lynnwood defines a “significant” tree as a tree that is at least 6 inches dbh and does not include Lombardy poplar, native willow, native alder, black locust, or black cottonwood. No significant trees were observed in the study area during field efforts. Several street trees are located along the bus bays within the transit center. These trees were not included in the assessment of impacts within the project footprint because the construction impacts of modifying the existing bus bays are anticipated to be isolated from, and not impact, these trees.

6 ENVIRONMENTAL IMPACTS

6.1 Burien Transit Center and Roadway Improvements

6.1.1 Wetlands, streams, and FWHCAs

No long-term or temporary construction impacts on wetlands, streams, or other FWHCAs are anticipated as a result of the project, as none were observed or are mapped within the study area.

Some vegetation removal would occur to the east of the existing transit station to provide for staging during construction. However, this vegetation is primarily landscaping shrubs surrounded by commercial development that provide little habitat opportunities. Post-construction, areas of landscaping and vegetation would be replanted with native vegetation.

6.1.2 Tree removals

No impacts to significant trees are anticipated within the Burien Transit Center and Roadway Improvements as no significant trees were observed in the project footprint.

6.2 Tukwila International Boulevard BRT Station and Roadway Improvements

6.2.1 Construction impacts

6.2.1.1 Wetlands, streams, and FWHCAs

No temporary construction impacts to wetlands, streams, or other FWHCAs within the footprint of the Tukwila International Boulevard BRT Station and Roadway Improvements project component are anticipated as a result of the project. Although wetlands and streams were assessed within the study area during field efforts, since field surveys were conducted, the project alignment has been revised and the project footprint reduced. Therefore, the area covered in field surveys is largely outside of the current project footprint. Project work in relation to the location of the wetlands and streams is shown in **Figure 6-1** and **Figure 6-2**.

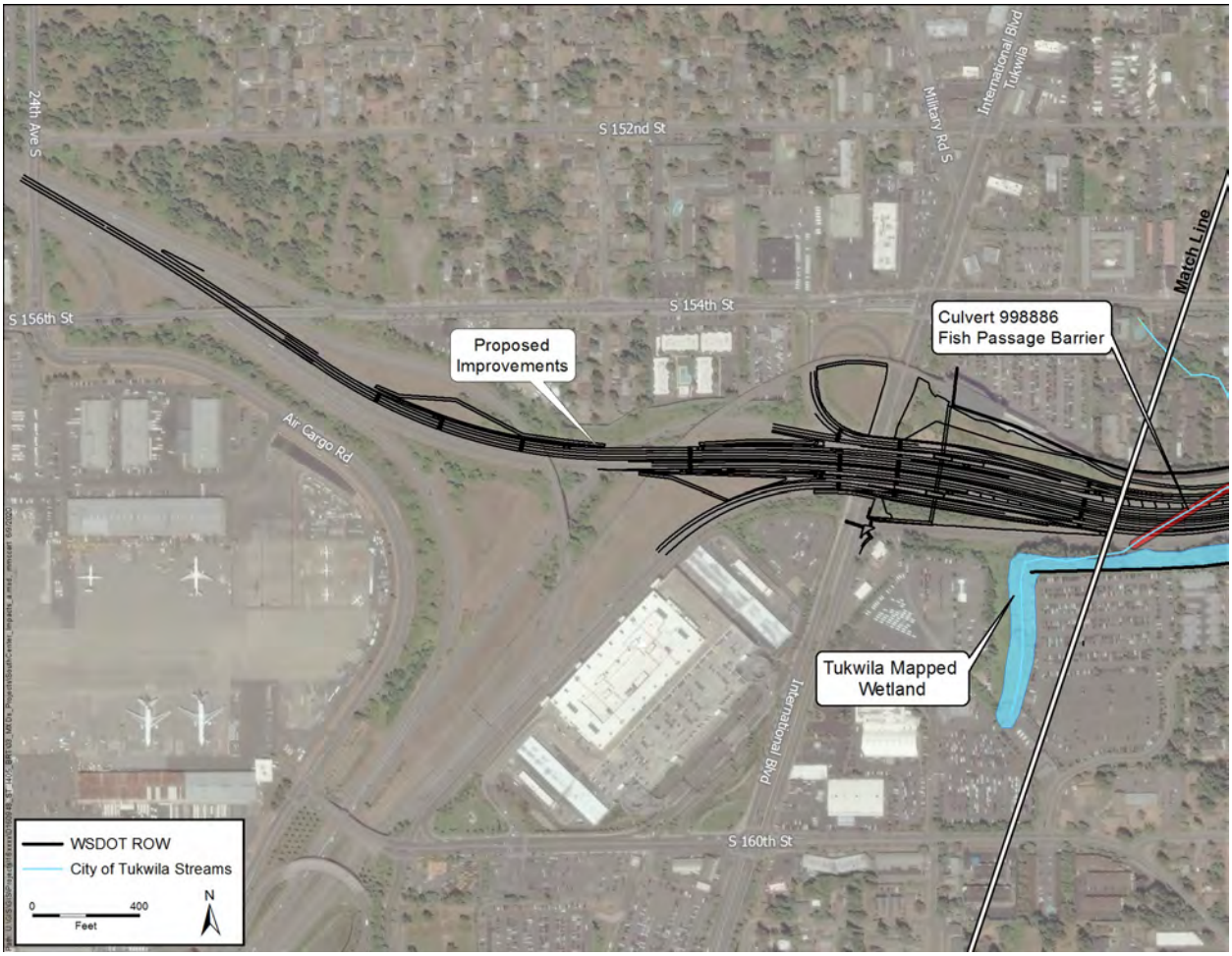


Figure 6-1 Wetlands, streams, and proposed improvements at the west end of the Tukwila International Boulevard BRT Station and Roadway Improvements project location

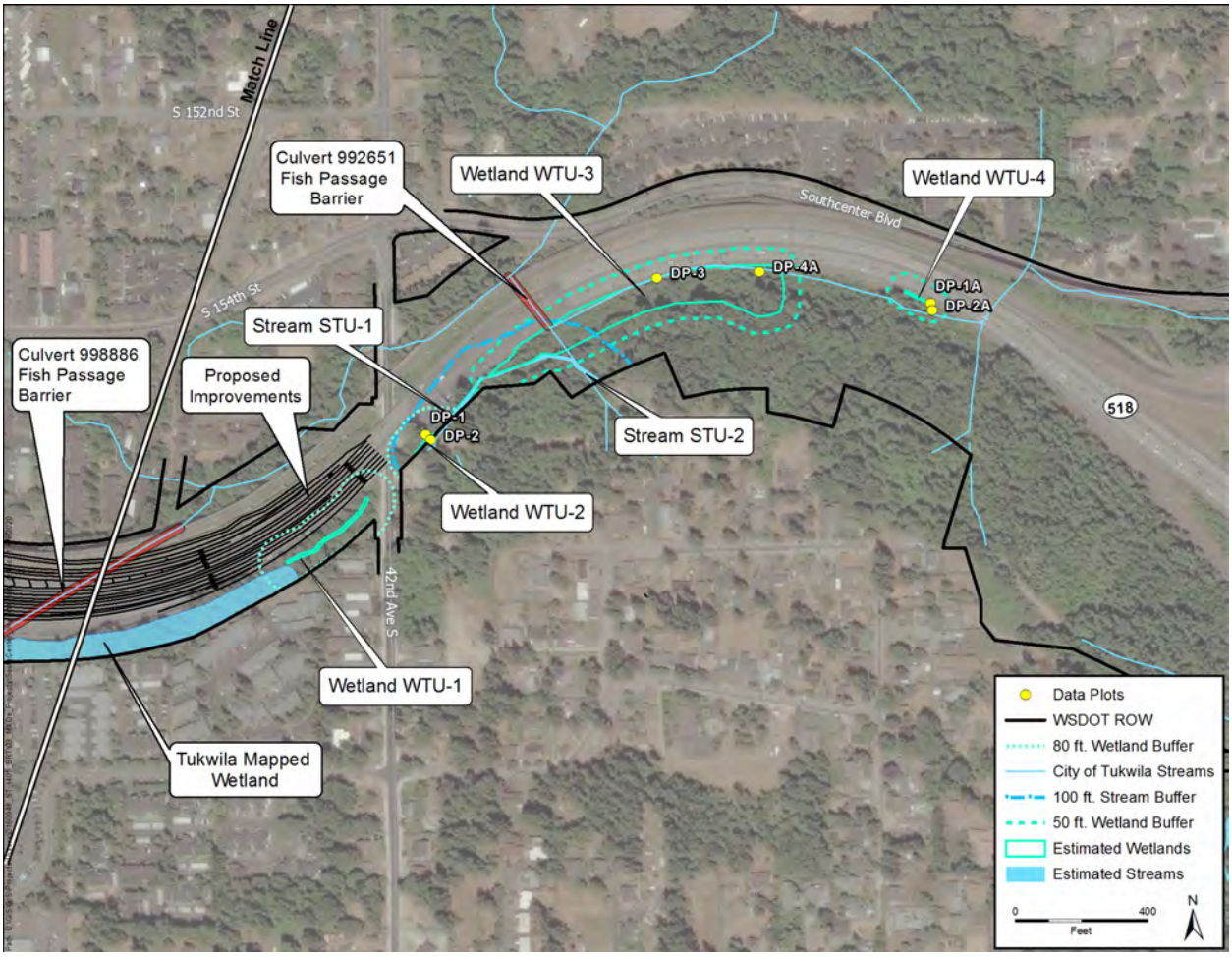


Figure 6-2 Wetlands, streams, and proposed improvements at the east end of the Tukwila International Boulevard BRT Station and Roadway Improvements project location

Vegetation removal would occur just south of the Tukwila International Boulevard BRT Station along the north side of SR 518 and continue east for approximately 1,780 feet to accommodate a new bus lane, staging area, and pedestrian overpass. Vegetation would also be cleared from the planting strip along the south side of SR 518 near the SR 99 overpass to accommodate additional SR 518 eastbound lanes, construction staging, and a new pedestrian overpass. Additional vegetation removal would occur in the westbound SR 518 off-ramp loop for the construction of a stormwater detention pond and retaining wall.

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 Tukwila. BMPs would also minimize the potential for sediment and waste materials (e.g., construction debris, fuel) to enter streams and wetlands during construction. Measures and

BMPs that would be incorporated during construction to minimize the potential for erosion include, but are not limited to, the following:

- Transport all construction 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 (TESC) 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 SWPPP. Other erosion control measures would be incorporated, as necessary, in accordance with City of Tukwila and Ecology requirements.
- Refuel construction equipment more than 100 feet from surface waters.
- Locate equipment and material staging in areas to prevent pollutants from entering a wetland or water body, consistent with project permits.
- Use nontoxic hydraulic fluids on all equipment working within on-site wetlands and streams.
- Seasonal restrictions (i.e., in-water work windows) would be applied to the project to avoid or minimize potential impacts on fish species, following approval from regulatory agencies.

No impacts on wetlands and streams outside the project footprint are anticipated to occur as a result of project construction. Additionally, no impacts to any other FWHCAs are anticipated, and none were observed in the field or mapped to occur in project vicinity.

6.2.2 Long-term impacts

6.2.2.1 Wetlands and streams

No long-term impacts to wetlands or streams are anticipated as a result of the project.

6.2.3 Tree removals

It is currently estimated that all 10 Category 2 trees located within WSDOT right-of-way on the south side of SR 518 would be removed for this project component. See Section 7 Mitigation Measures for discussion of tree replacement.

6.3 South Renton Transit Center and Roadway Improvements

6.3.1 Wetlands, streams, and FWHCAs

No long-term or temporary construction impacts to wetlands, streams, or FWHCAs are anticipated as a result of the project, as no critical areas were observed or are mapped within the study area.

Vegetation removal would occur along the north side of S Grady Way and the east side of SR 167 during construction of the transit center. This vegetation consists of small landscaping shrubs and street trees, which provide some habitat function in the largely urban area. However, post-construction, street trees would be installed around the perimeter of the transit center, and the portion of the site south of the proposed bus loop would be planted and used as open space, resulting in no loss of habitat.

6.3.2 Tree removals

It is currently estimated that all 34 identified trees would be removed for this project component. These include trees in City of Renton rights-of-way and Category 2 trees in WSDOT right-of-way. As stated above, the City of Renton does not currently have a tree protection code or a definition of a “significant tree.” However, the city asks that applicants contact the Urban Forestry and Natural Resources Manager before any work occurs on or around street trees.

6.4 Bellevue Transit Center and Off-site Layover

6.4.1 Wetlands, streams, and FWHCAs

No long-term or temporary construction impacts to wetlands, streams, or other FWHCAs are anticipated as a result of the project, as none were observed or are mapped within the study area. No clearing of vegetation is proposed in the study area and, therefore, no impacts to habitat are expected.

6.4.2 Tree removals

No impacts to significant trees are anticipated as no significant trees were observed in the study area.

6.5 Totem Lake/Kingsgate Station and Kingsgate Park-and-Ride Garage

6.5.1 Wetlands, streams, and FWHCAs

No long-term impacts or temporary construction impacts to wetlands, streams, or FWHCAs are anticipated as a result of the project, as none were observed or are mapped within the study area. Landslide susceptibility areas are mapped along the edges of the Kingsgate site but outside the limits of construction and, therefore, would not be impacted by the project.

Vegetation removal would occur in the south and southeast portion of the study area to construct the proposed parking structure and stormwater facilities. Most of this area is mowed lawn interspersed with large conifers. However, the study area is bordered by I-405 to the northeast and residential developments to the west and south, and the trees likely only act as perching areas for avian species en route to the wetland complex to the north. Additional trees may be cleared from the planting strips in the northern portion of the parking lot to provide access and staging during construction.

6.5.2 Tree removals

It is currently estimated that all 17 significant trees, as defined by the City of Kirkland, and Category 2 trees, as defined by WSDOT, would be removed for this project component. All significant/Category 2 trees anticipated for removal are Douglas firs located in planting strips or on the perimeter of the existing parking lot. As described above, additional trees may be removed for construction staging. If, based on final design, any staging areas are proposed outside of the project footprint on the site and it appears that any additional trees may need to be removed for that purpose, such trees would be evaluated to determine whether they are classified as significant by the City of Kirkland or meet WSDOT's category definitions. Mitigation for loss of those trees would be provided as required by applicable codes or policies.

6.6 Brickyard Station and Roadway Improvements

6.6.1 Construction impacts

It is currently anticipated that no temporary construction impacts to wetlands and streams within the footprint of the Brickyard Station and Roadway Improvements project component would occur as a result of the project. Based on a review of the current WSDOT plan sheets, no overlap of the delineated boundaries of the three on-site wetlands and project limits occurs. If project limits change as WSDOT's design progresses, these areas would be re-evaluated for potential impacts.

To further ensure impacts to critical areas are reduced to the extent possible, appropriate BMPs would be applied during construction. For more information on appropriate BMPs, refer to Section 6.2.1.1.

It is anticipated that some vegetation would need to be removed for construction access that may temporarily reduce habitat. However, as described above, clearing and grading limits have not been provided by WSDOT so exact areas are not yet known. As clearing and grading limits are provided, vegetation impacts in these area will be re-evaluated.

6.6.2 Long-term impacts

It is currently anticipated that no long-term impacts to wetlands and streams within the footprint of the Brickyard Station and Roadway Improvements project component would occur as a result of the project. As noted in Section 4, wetlands and streams were assessed by WSDOT within the study area during their field efforts; based on a review of WSDOT plan sheets and field data, no overlap of delineated boundaries and project limits would occur. If project limits change as design progresses, these areas will be revaluated for impacts.

As described above, grading limits have not been provided by WSDOT, and therefore are currently not known. However, some areas of anticipated tree impacts were provided by WSDOT and are primarily located near the location of the proposed BRT station, pedestrian bridge, sidewalk, and pedestrian access points. Based on the current WSDOT plans, these impacts are anticipated to be permanent.

6.6.3 Tree removals

As described above, Sound Transit has not performed a tree assessment of the Brickyard Station and Roadway Improvements project component because this component is being designed and constructed by WSDOT. Additionally, no information on trees has been received by WSDOT. Therefore, it is currently unknown if the tree impact areas provided by WSDOT, and described in Section 6.6.2, involve the removal of Category 2 trees.

6.7 Lynnwood City Center Transit Station BRT and Roadway Improvements

6.7.1 Wetlands, streams, and FWHCAs

No long-term or temporary construction impacts to wetlands, streams, or other FWHCAs are anticipated as a result of the project, as no such features were observed or are mapped within the study area other than the steep slope along the Poplar Way loop. No impacts to the slope are anticipated as most of the work would occur at the road edge, and appropriate BMPs would be applied during construction (see Section 6.2.1.1). Only minor clearing of vegetation is anticipated to construct the bus lane and the detention wall; however, these areas are currently dominated by grasses and no impacts to habitat are expected.

6.7.2 Tree removals

It is estimated that 15 Category 2 trees within WSDOT's right-of-way would be removed for constriction staging along the I-5 on-ramp.

7 MITIGATION MEASURES

No temporary or long-term impacts to wetlands, streams, and their associated buffers are anticipated and, therefore, no mitigation measures are proposed. Although not anticipated, if the design changes, the project would be revaluated for impacts to critical areas and appropriate mitigation would be identified.

7.1 Mitigation measures for construction impacts

No short-term construction impacts to wetlands or streams within the footprint or in the project vicinity are currently anticipated as a result of implementation of the BMPs described in Section 6.2.1. Direct impacts to wetlands and streams during construction have been avoided.

7.2 Mitigation measures for long-term impacts

No long-term impacts to wetlands and streams are anticipated and, therefore, no mitigation is proposed.

7.3 Impacts to regulated trees

As described above, impacts to trees defined by local jurisdictions as significant would only occur in the Cities of Tukwila and Kirkland. Trees would also be removed within WSDOT right-of-way. Within the Lynnwood City Center Transit Station BRT and Roadway Improvements project component, only trees within WSDOT right-of-way would be removed. The City of Lynnwood's tree replacement requirements are provided in Section 7.3.4. While the City of Renton does not currently regulate trees in its jurisdiction, the city does request coordination as described in Section 7.3.2. The proposed project would adhere to mitigation requirements for tree impacts in the jurisdictions where they occur. A discussion of relevant tree replacement requirements for each of these jurisdictions is provided below.

7.3.1 City of Tukwila

Significant tree removal that cannot be avoided as a result of construction of the Tukwila International Boulevard BRT Station and Roadway Improvements would be replaced per requirements in TMC 18.44.080.B.4, which states that significant trees removed shall be replaced with the ratios shown in **Table 7-1**.

Table 7-1 City of Tukwila Tree Replacement Ratios

Diameter of tree removed (measured at 4.5 feet from the ground)	Number of replacement trees required
4 to 6 inches (single trunk); 2 inches (any trunk of a multi-trunk tree)	3:1
6 to 8 inches	4:1
8 to 20 inches	6:1
Over 20 inches	8:1

SOURCE: TMC 18.44.080.B.4

7.3.2 City of Renton

The City of Renton currently does not have a tree ordinance. However, according to the city's website, the Urban and Community Forestry Task Force is developing the Urban Forestry Ordinance that would include regulations for street trees. The goal is to have these new regulations incorporated into the Renton Municipal Code. Until the ordinance is approved, the city asks that applicants contact the Urban Forestry and Natural Resources Manager before any work to or around street trees.

7.3.3 City of Kirkland

To meet its goal of an overall 40 percent canopy coverage, the City of Kirkland does not provide tree replacement ratios as part of the requirements in KZC Chapter 95 – *Tree Management and Required Landscaping*, and instead focuses on tree retention. Per KZC 95.30, an applicant for a development permit must submit a tree retention plan to the city, prepared by a qualified arborist. Per KZC 95.30.5, for any development other than residential, the tree retention plan must include the following:

1. A detailed tree inventory showing all the significant trees on the subject property
2. A detailed site plan showing the surveyed locations as required by the Planning official
3. A final landscaping plan showing retained trees
4. An arborists report describing significant trees potentially impacted by the proposed development and the removal of trees with a high retention value

Additionally, any development other than residential shall meet the following tree retention standards:

1. Trees with a high retention value must be retained and protected to the maximum extent possible
2. Trees with a moderate retention value must be protected if feasible
3. Preservation and maintenance agreements are required for all remaining trees on the subject property

Currently it is unknown if tree removal at the Kingsgate Park-and-Ride would be regulated by the City of Kirkland or WSDOT. If WSDOT takes jurisdiction, replacement requirements in Section 7.3.5 would be met.

7.3.4 City of Lynnwood

Per LMC 17.15.090, the number of replacement trees required for significant tree removal that cannot be avoided as a result of construction of the Lynnwood City Center Transit Station BRT and Roadway Improvements will be determined using the following methods:

1. Assign a “Tree Unit” to each significant tree, based on their dbh, using the following:
    - Trees with a dbh of 6 to 10 inches receive 1 Tree Unit
    - Trees with a dbh of 10.1 to 18 inches receive 2 Tree Units
    - Trees with a dbh of 18.1 to 36 inches receive 3 Tree Units
    - Trees with a dbh greater than 36 inches receive 4 Tree Units

2. Count the number of significant trees to be removed.
3. Measure the dbh of those significant trees.
4. Multiple the number of significant tree removed by the number of tree units to determine the number of trees to be replaced.

7.3.5 WSDOT tree replacement requirements

In WSDOT rights- of-way, the project would have to follow WSDOT tree replacement requirements in the WSDOT *Roadside Policy Manual* (WSDOT 2015), which states that Category 2 trees shall be replaced at a ratio of one 1-gallon replacement tree for each 1-inch of trunk diameter. If larger container sizes are used, the plant quantity can be adjusted down. For Category 1 trees, a landscape architect should be consulted to determine the appropriate project-specific restoration.

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APPENDIX A

Field Investigation Photos

Photo 1. Wetland WTU-1 facing west.

Photo 2. Wetland WTU-1 facing east.

Photo 3. Wetland WTU-2 facing south

Photo 4. Wetland WTU-2 facing south

Photo 5. Wetland WTU-3 looking upslope to the south

Photo 6. Wetland WTU-3 looking downslope to the north

Photo 7. Wetland WTU-3 along roadside looking northwest

Photo 8. Wetland WTU-4 along roadside looking southeast

Photo 9. Upstream pond and wide floodplain reach of Stream STU-1

Photo 10. Incised middle reach of Stream STU-1

Photo 11. Quarry spalled-lined lower reach of Stream STU-1

Photo 12. Stream STU-2 habitat and substrate.

Photo 13. Overflow culvert at end of STU-2 and STU-3

Photo 14. Stream STU-3 on construction bench above SR-518 road prism.

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 (Federal Register 1988), the Washington Shoreline Management Act of 1971, and the Washington State Growth Management Act 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 Shoreline Management Act and the Growth Management Act 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” 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

All three jurisdictions where wetlands were observed specify the use of the Washington State Department of Ecology (Ecology's) Washington State Wetland Rating System for Western Washington. Ecology revised this rating system in 2014 and the *Washington State Wetland Rating System for Western Washington – Revised 2014* (Hruby 2014) version is currently considered best available science. The Cities of Bothell and Kirkland specifically require the use of the 2014 revised version. However, the City of Tukwila's Critical Areas Ordinance has not been revised to include the current version, and instead specifies the use of the *Washington State Department of Ecology's (Ecology's) 2004 Washington State Wetland Rating System for Western Washington* (Hruby 2004). Therefore, both rating systems were applied to wetlands within the City of Tukwila.

Ecology developed the 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 the 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 E 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.

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APPENDIX C

Wetland Delineation Data Sheets

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

Project/Site: I-405 Site 2E | City/County: Tukwilla/King | Sampling Date: 28-Aug-2019
Applicant/Owner: Sound Transit | State: WA | Sampling Point: DP-1
Investigator(s): A. Brophy, M. Muscari | Section, Township, Range: 23, T23N,R04E
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none | Slope (%): 2
Subregion (LRR): A | Lat: 47.464244 | Long: -122.28069 | Datum: NAD83
Soil Map Unit Name: Urban land-Alderwood complex, 5 to 12 percent slopes | NWI classification: none (upland)
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No x (If no, explain in Remarks.)
Are Vegetation ___ Soil ___ or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X	No ___	
Hydric Soil Present?	Yes ___	No X	**Is the Sampled Area within a Wetland?** Yes ___ No **X**
Wetland Hydrology Present?	Yes ___	No X	

Remarks: Climatic conditions - Drought declared for WA state. Previous months have been especially dry.
Data plot located in upland adjacent to Wetland WTU-2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	40	Y	FAC
2. Fraxinus latifolia	40	Y	FACW
3. Thuja plicata	30	Y	FAC
4. Salix lucida	30	Y	FACW
	140	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m R)			
1. Rubus armeniacus	35	Y	FAC
2. Acer circinatum	trace	N	FAC
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 1m R)			
1. Juncus effusus	5	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	5	= Total Cover	
Woody Vine Stratum (Plot size: 5m R)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 75

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (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 = 0

Hydrophytic Vegetation Indicators:
___ 1- Rapid Test For Hydrophytic Vegetation
X 2- Dominance Test is >50%
___ 3- Prevalence Index is ≤3.0[1]
___ 4- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5- Wetland Non-Vascular Plants[1]
___ 6- Problematic Hydrophytic Vegetation[1](Explain)
[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes **X** No ___

Remarks:

SOIL

Sampling Point: DP-1

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					sand loam	
5-10	10YR 5/2	100					sand loam	compacted fill material

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: Compaction/fill/cobble

Depth (inches): 10

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (Inches): ___

Water Table Present? Yes ___ No X Depth (Inches): ___

Saturation Present? Yes ___ No X Depth (Inches): ___

(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** **X**

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: I-405 Site 2E | City/County: Tukwilla/King | Sampling Date: 28-Aug-2019
Applicant/Owner: Sound Transit | State: WA | Sampling Point: DP-2
Investigator(s): A. Brophy, M. Muscari | Section, Township, Range: 23, T23N,R04E
Landform (hillslope, terrace, etc.): terrace | Local relief (concave, convex, none): concave | Slope (%): 0
Subregion (LRR): A | Lat: 47.46418 | Long: -122.280657 | Datum: NAD83
Soil Map Unit Name: Urban land-Alderwood complex, 5 to 12 percent slopes | NWI classification: none (PFO/PSS)
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No x (If no, explain in Remarks.)
Are Vegetation ___ Soil ___ or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X No ___	**Is the Sampled Area**
Hydric Soil Present?	Yes X No ___	**within a Wetland?** **Yes X No ___**
Wetland Hydrology Present?	Yes X No ___	

Remarks: Climatic conditions - Drought declared for WA state. Previous months have been especially dry.
Data plot located in Wetland WTU-2.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lucida	50	Y	FACW
2. Fraxinus latifolia	40	Y	FACW
3. Thuja plicata	20	N	FAC
4. Populus balsamifera	20	N	FAC
	130	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m R)			
1. Rubus armeniacus	30	Y	FAC
2. Ilex aquifolium	trace	N	FACU
3.			
4.			
5.			
	15	= Total Cover	
Herb Stratum (Plot size: 1m R)			
1. Blechnum spicant	trace	N	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: 5m R)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (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 = 0

Hydrophytic Vegetation Indicators:
___ 1- Rapid Test For Hydrophytic Vegetation
X 2- Dominance Test is >50%
___ 3- Prevalence Index is ≤3.0[1]
___ 4- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5- Wetland Non-Vascular Plants[1]
___ 6- Problematic Hydrophytic Vegetation[1](Explain)
[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ___**

Remarks:

SOIL Sampling Point: DP-2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					sand silt loar	
1-11	10YR 2/1	100					silt sand loar	
11-18	5Y 5/1	100					sand gravelly	

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ 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** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes X	No ___	Depth (Inches):	surface
Water Table Present?	Yes X	No ___	Depth (Inches):	surface
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (Inches):	surface

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:

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

Project/Site: I-405 Site 2E | City/County: Tukwilla/King | Sampling Date: 28-Aug-2019
Applicant/Owner: Sound Transit | State: WA | Sampling Point: DP-3
Investigator(s): A. Brophy, M. Muscari | Section, Township, Range: 23, T23N,R04E
Landform (hillslope, terrace, etc.): roadside ditch | Local relief (concave, convex, none): concave | Slope (%): 0
Subregion (LRR): A | Lat: 47.465479 | Long: -122.277855 | Datum: NAD83
Soil Map Unit Name: Alderwood-Everett-Urban land complex, 12 to 35 percent slopes | NWI classification: none (upland)
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ___ No x (If no, explain in Remarks.)
Are Vegetation ___ Soil ___ or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X No ___	**Is the Sampled Area**
Hydric Soil Present?	Yes X No ___	**within a Wetland?** **Yes X No ___**
Wetland Hydrology Present?	Yes X No ___	

Remarks: Climatic conditions - Drought declared for WA state. Previous months have been especially dry. Hydrology, soils and veg of the entire area have been altered due to construction of the highway. Data plot located in Wetland WTU-3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lucida	20	Y	FACW
2. Acer rubrum	5	Y	FAC
3.			
4.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m R)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m R)			
1. Nasturtium officinale	80	Y	OBL
2. Equisetum telmateia	10	N	FACW
3. Athyrium cyclosorum	5	N	FAC
4. Holcus lanatus	5	N	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	100	= Total Cover	
Woody Vine Stratum (Plot size: 5m R)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ___

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (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 = 0

Hydrophytic Vegetation Indicators:
___ 1- Rapid Test For Hydrophytic Vegetation
X 2- Dominance Test is >50%
___ 3- Prevalence Index is ≤3.0[1]
___ 4- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ 5- Wetland Non-Vascular Plants[1]
___ 6- Problematic Hydrophytic Vegetation[1](Explain)
[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ___**

Remarks: Data plot located in ditch along highway. Hydrology from pipe upslope.

SOIL Sampling Point: DP-3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5Y 2.5/1	100					silt loam	
1-12	2.5Y 2.5/1	100					sand loam	high organics, quarry spalls

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: quarry spalls

Depth (inches): 12

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (Inches): NA		
Water Table Present?	Yes X	No ___	Depth (Inches): 6		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (Inches): surface	**Wetland Hydrology Present?**	**Yes** X **No** ___

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

Remarks:

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

Project/Site: I-405 BRT Site 2E | City/County: Tukwilla/King | Sampling Date: 22-Nov-2019
Applicant/Owner: Sound Transit | State: WA | Sampling Point: DP-4A
Investigator(s): A. Brophy, J. Redman | Section, Township, Range: 23, T23N,R04E
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none | Slope (%): 12
Subregion (LRR): A | Lat: 47.465534 | Long: -122.276606 | Datum: NAD83
Soil Map Unit Name: Alderwood-Everett-Urban land complex, 12 to 35 percent slopes | NWI classification: none (upland)
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X No ____	
Hydric Soil Present?	Yes X No ____	**Is the Sampled Area**
Wetland Hydrology Present?	Yes X No ____	**within a Wetland? Yes X No ____**

Remarks: Climatic conditions were wetter than normal for the three months prior according to the SEATAC WETS table. Hydrology, soils and veg of the entire area have been altered due to construction of the highway. Data plot located in Wetland WTU-3.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lucida	60	Y	FACW
2. Thuja plicata	45	Y	FAC
3.			
4.			
	105	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m R)			
1. Rubus spectabilis	20	Y	FAC
2.			
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 1m R)			
1. Equisetum telmateia	trace	NA	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	
Woody Vine Stratum (Plot size: 5m R)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 90

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (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 = 0

Hydrophytic Vegetation Indicators:
____ 1- Rapid Test For Hydrophytic Vegetation
X 2- Dominance Test is >50%
____ 3- Prevalence Index is ≤3.0[1]
____ 4- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5- Wetland Non-Vascular Plants[1]
____ 6- Problematic Hydrophytic Vegetation[1](Explain)
[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: DP-4A

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/1	100					sand loam	cobbles
3-9	10YR 2/1	97	10YR 5/8	3	C	M	sand loam	cobbles
9-16	10YR 3/1	95	7.5YR 4/6	5	C	M	sand loam	cobbles

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

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

Indicators for Problematic Hydric Soils[3]:

___ 2 cm Muck (A10)
___ Red Parent Material (TF2)
___ Very Shallow Dark Surface (TF12)
___ 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** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (Inches): NA
Water Table Present? Yes ___ No X Depth (Inches): NA
Saturation Present? Yes X No ___ Depth (Inches): 3
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

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

Remarks:

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

Project/Site: I-405 BRT Site 2E | City/County: Tukwilla/King | Sampling Date: 22-Nov-2019
Applicant/Owner: Sound Transit | State: WA | Sampling Point: DP-1A
Investigator(s): A. Brophy, J. Redman | Section, Township, Range: 23, T23N,R04E
Landform (hillslope, terrace, etc.): roadside ditch | Local relief (concave, convex, none): concave | Slope (%): 1
Subregion (LRR): A | Lat: 47.465252 | Long: -122.274526 | Datum: NAD83
Soil Map Unit Name: Alderwood-Everett-Urban land complex, 12 to 35 percent slopes | NWI classification: none (upland)
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X No ____	**Is the Sampled Area**
Hydric Soil Present?	Yes X No ____	**within a Wetland?** **Yes X No ____**
Wetland Hydrology Present?	Yes X No ____	

Remarks: Climatic conditions were wetter than normal for the three months prior according to the SEATAC WETS table. Hydrology, soils and veg of the entire area have been altered due to construction of the highway. Data plot located in Wetland WTU-4.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m R)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	3	Y	FAC
2.			
3.			
4.			
	3	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m R)			
1. Salix lucida	20	Y	FACW
2. Rubus armeniacus	3	N	FAC
3.			
4.			
5.			
	23	= Total Cover	
Herb Stratum (Plot size: 1m R)			
1. Nasturtium officinale	70	Y	OBL
2. Juncus effusus	17	N	FACW
3. Holcus lanatus	5	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	92	= Total Cover	
Woody Vine Stratum (Plot size: 5m R)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00 (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 = 0

Hydrophytic Vegetation Indicators:
____ 1- Rapid Test For Hydrophytic Vegetation
X 2- Dominance Test is >50%
____ 3- Prevalence Index is ≤3.0[1]
____ 4- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5- Wetland Non-Vascular Plants[1]
____ 6- Problematic Hydrophytic Vegetation[1](Explain)
[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: Data plot located in ditch along highway.

SOIL Sampling Point: DP-1A

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1	100					sand loam	high organics, quarry spalls

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: quarry spalls

Depth (inches): 10

Hydric Soil Present? Yes X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (Inches):	NA
Water Table Present?	Yes X	No ___	Depth (Inches):	5
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (Inches):	surface

Wetland Hydrology Present? Yes X **No** ___

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

Remarks:

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

Project/Site: I-405 BRT Site 2E | City/County: Tukwilla/King | Sampling Date: 22-Nov-2019
Applicant/Owner: Sound Transit | State: WA | Sampling Point: DP-2A
Investigator(s): A. Brophy, J. Redman | Section, Township, Range: 23, T23N,R04E
Landform (hillslope, terrace, etc.): hillslope | Local relief (concave, convex, none): none | Slope (%): 5
Subregion (LRR): A | Lat: 47.465194 | Long: -122.274507 | Datum: NAD83
Soil Map Unit Name: Alderwood-Everett-Urban land complex, 12 to 35 percent slopes | NWI classification: none (upland)
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____ Soil ____ or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x 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 X	No ____	
Hydric Soil Present?	Yes ____	No X	**Is the Sampled Area**
Wetland Hydrology Present?	Yes ____	No X	**within a Wetland? Yes ____ No X**

Remarks: Climatic conditions were wetter than normal for the three months prior according to the SEATAC WETS table.
Hydrology, soils and veg of the entire area have been altered due to construction of the highway.
Data plot located in upland adjacent to Wetland WTU-4.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m R)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 5m R)			
1. Salix lucida	20	Y	FACW
2. Rubus armeniacus	5	N	FAC
3. Thuja plicata	3	N	FAC
4.			
5.			
	28 = Total Cover		
Herb Stratum (Plot size: 1m R)			
1. Geranium robertianum	40	Y	FACU
2. Rumex crispus	20	Y	FAC
3. Holcus lanatus	20	Y	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: 5m R)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75.00 (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 = 0

Hydrophytic Vegetation Indicators:
____ 1- Rapid Test For Hydrophytic Vegetation
X 2- Dominance Test is >50%
____ 3- Prevalence Index is ≤3.0[1]
____ 4- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ 5- Wetland Non-Vascular Plants[1]
____ 6- Problematic Hydrophytic Vegetation[1](Explain)
[1] Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: Data plot located upslope of ditch along highway.

SOIL

Sampling Point: DP-2A

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: quarry spalls

Depth (inches): 10

Hydric Soil Present? Yes ___ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No X Depth (Inches): NA

Water Table Present? Yes ___ No X Depth (Inches): NA

Saturation Present? Yes ___ No X Depth (Inches): NA

(includes capillary fringe)

Wetland Hydrology Present? Yes ___ No X

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

Remarks:

APPENDIX D

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 D-1 below shows the 30th and 70th percentiles for precipitation totals (calculated from the long-term precipitation data) compared to the actual precipitation totals in the region for May through July 2019. Precipitation is determined to have a "normal" condition if it falls within the 30th to 70th percentile range; if the recorded data are 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 3 months (Table D-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 (July 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 3-month period is "drier than normal" (6–9), "normal" (10–14), or "wetter than normal" (15–18). Table D-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 August 13, 2019 field investigation (**Table D-1**).

Table D-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
May	1.27	2.32	0.62	Dry	1	1	Normal (12)
June	0.98	1.88	0.90	Dry	1	2	
July	0.32	0.85	1.15	Wet	3	3	

SOURCE: WETS Seattle-Tacoma Intl AP, 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.* U.S. Department of Agriculture, Natural Resources Conservation Service. (Internet website: https://efotg.sc.egov.usda.gov/efotg_locator.aspx); accessed August 2019.

Sprecher, S., and A. Warne. 2000. *Accessing and Using Meteorological Data to Evaluate Wetland Hydrology.* Technical Report TR-WRAP-00-01. U.S. Army Corps of Engineers, Engineer Research and Development Center, Operations Division Regulatory Branch, Vicksburg, Mississippi. April.

APPENDIX E

Ecology Wetland Rating System Forms and Figures

Wetland name or number: WTU-1

WETLAND RATING FORM - WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): WTU-1 Date of site visit: 11/22/19

Rated by A. Brophy & C.Hersum Trained by Ecology? Yes ☑ No ☐ Date: 10/11/18

SEC: 23 TWNSHP: 23N RNGE: 04E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure _____ **Estimated size:** _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland:

I ☐ **II** ☐ **III** ☐ **IV** ☑

Category I = Score >=70	
Category II = Score 51-69	
Category III = Score 30-50	
Category IV = Score <30	

Score for Water Quality Functions	4
Score for Hydrologic Functions	4
Score for Habitat Functions	12
TOTAL score for functions	**20**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ **II** ☐ **Does not Apply** ☑

Final Category **(choose the "highest" category from above)** **IV**

Check the appropriate type and class of wetland being rated.

Wetland Type	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☑

Wetland Class	
Depressional	☐
Riverine	☐
Lake-fringe	☐
Slope	☑
Flats	☐
Freshwater Tidal	☐
Check if multiple HGM classes are present	☐

Comments:

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below, you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Special Protection (in addition to the protection recommended for its category)		YES	NO
SP1.	*Has the wetland unit been documented as a habitat for any federally listed Threatened or Endangered (T/E)* ***plant or animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☑
SP2.	*Has the wetland unit been documented as habitat for any state listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands.	☐	☑
SP3.	*Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☑
SP4.	*Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☑

To complete the next part of the data sheet, you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, indentify 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 (i.e., except during floods)?

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

If YES, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ YES - **Freshwater Tidal Fringe** ☐ NO - **Saltwater Tidal Fringe (Estuarine)**

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 rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Saltwater Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is being kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. xx).

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

☑ 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 both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) where at least 20 acres (8 ha) are permanently inundated (ponded or flooded);

☐ At least 30% of the open water area is deeper than 6.6 feet (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.**

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 feet in diameter and less than 1 foot deep).*

☐ NO - go to 5 ☑ YES - the wetland class is **Slope**

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 once every two years.

☐ NO - go to 6 ☐ YES - the wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 stream or river running through it and providing water? The unit seems to be maintained by higher ground water 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 your wetland. 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 second class 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 a Delineated Wetland Boundary	***Class to Use in Rating***	
Slope + Riverine	Riverine	☐
Slope + Depressional	Depressional	☐
Slope + Lake-fringe	Lake-fringe	☐
Depressional + Riverine along stream within boundary	Depressional	☐
Depressional + Lake-fringe	Depressional	☐
Saltwater Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics	☐

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

S Slope Wetlands

WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality.

		Points
S 1.	**Does the wetland unit have the <u>potential</u> to improve water quality? *(see p. 64)***	
S 1.1	Characteristics of average slope of the unit: ☐ Slope is 1% or less (*a 1% slope has a 1-foot vertical drop for every 100 ft. horizontal distance*) **Points = 3** ☑ Slope is 1% - 2% **Points = 2** ☐ Slope is 2% - 5% **Points = 1** ☐ Slope is greater than 5% **Points = 0**	2
S 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES = 3 points NO = 0 points	0
S 1.3	Characteristics of the vegetation in the wetland that trap sediments and pollutants: *choose the points appropriate for the description that best fits vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation >90% of wetland area **Points = 6** Dense, uncut, herbaceous vegetation >1/2 of wetland area **Points = 3** Dense, woody vegetation >1/2 of wetland area **Points = 2** Dense, uncut, herbaceous vegetation >1/4 of wetland area **Points = 1** Does not meet any of the criteria above for vegetation **Points = 0**	0
	Aerial photo or map with vegetation polygons	**Figure 3**
	Total for S 1 *Add the points in the boxes above*	2
S 2.	**Does the wetland unit have the <u>opportunity</u> to improve water quality? *(see p. 67)*** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes, or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources but any single source would qualify as an opportunity.* ☐ Grazing in the wetland or within 150 feet of the wetland ☐ Untreated stormwater discharges to the wetland ☐ Tilled fields, logging, or orchards within 150 feet of the wetland ☑ Residential, urban areas, or golf courses are within 150 feet upslope of wetland ☐ Other: _____	Multiplier 2
	YES - multiplier is **2** NO - multiplier is **1**	
TOTAL - Water Quality Functions	Multiply the score from S 1. by S 2. ***Add score to table on p. 1***	4

S Slope Wetlands

HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion.

		Points
S 3.	**Does wetland unit have the <u>potential</u> to reduce flooding/erosion?** ***(see p. 68)***	
S 3.1	Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have truoble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* ☐ Dense, uncut, **rigid** vegetation covers >90% of wetland area **Points = 6** ☐ Dense, uncut, **rigid** vegetation covers >1/2 of wetland area **Points = 3** ☐ Dense, uncut, **rigid** vegetation covers >1/4 of wetland area **Points = 1** ☑ More than 3/4 of area is grazed, mowed, tilled, or vegetation is not rigid **Points = 0**	0
S 3.2	Characteristics of the slope wetland that holds back small amounts of flood flows: *the slope wetland has small surface depressions that can retain water over at least 10% of its area* YES = **2 points** NO = **0 points**	2
	Record the points from the boxes above	2
S 4.	**Does wetland unit have the opportunity to reduce flooding and erosion?** ***(see p. 70)***	
	Is the wetland in a landscape position where the reduction in water velocity it provides help to protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☑ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other: _____	Multiplier 2
	YES - multiplier is **2** NO - multiplier is **1**	
TOTAL - Hydrologic Functions	Multiply the score from S 3. by S 4. ***Add score to table on p. 1***	4

These questions apply to wetlands of all HGM classes

HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat.

H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? — **Points**

H 1.1 <u>Vegetation structure</u> ***(see p. 72)***

Check the types of vegetation classes present (as defined by Cowardin). Size threshold for class is 1/4 acre or more than 10% of the areaif unit is smaller than 2.5 acres.

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

If the unit has a forested class, check if: — 0

- ☐ 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.

Add the number of vegetation types that qualify. If you have:

4 structures or more	**Points = 4**
3 structures	**Points = 2**
2 structures	**Points = 1**
1 structure	**Points = 0**

Map of Cowardin vegetation classes — **Figure 1**

H 1.2 <u>Hydroperiods</u> ***(see p. 73)***

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if less than 2.5 acres in size or 1/4 acre to count (see text for descriptions of hydroperiods).

☐ Permanently flooded or inundated	4 or more types present	**Points = 3**
☑ Seasonally flooded or inundated	3 types present	**Points = 2**
☐ Occasionally flooded or inundated	2 types present	**Points = 1**
☑ Saturated only	1 type present	**Points = 0**

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

2

Map of hydroperiods — **Figure 2**

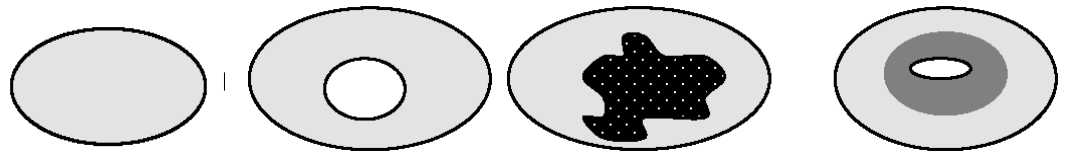
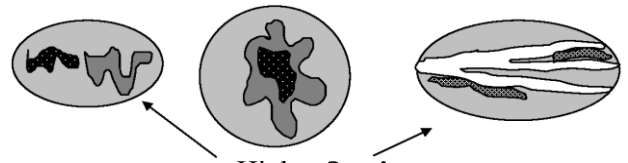
H 1.3 <u>Richness of Plant Species</u> ***(see p. 75)***

Count the number of plant species in the wetland that cover at least 10 sq. ft. (different patches of the same species can be combined to meet the size threshold). 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**
List species below if you want to:	<5 species	**Points = 0**

1

Total for page: 3

		Points
H 1.4	Interspersion of Habitats ***(see p. 76)*** *Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1) or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.*  None = **0 points** Low = **1 point** Moderate = **2 points**  [riparian braided channels] High = **3 points** NOTE: If you have four or more vegetation types or three vegetation types and open water, the rating is always "high". **Use map of Cowardin vegetation classes.**	0
H 1.5	Special Habitat Features ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4 inches in diameter and 6 feet long). ☐ Standing snags (diameter at the bottom >4 inches) in the wetland. ☐ Undercut banks are present for at least 6.6 feet (2 m) and/or overhanging vegetation extends at least 3.3 feet (1 m) over a stream (or ditch) in or contiguous with the wetland, for at least 33 feet (10 m). ☐ Stable steep banks of fine material that might be used by beaver/muskrat for denning (>30° slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet turned brown/gray*). ☐ At least 1/4 acre of thin-stemmed presistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*). ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants.	1
	Note: The 20% stated in early printings of the manual on page 78 is an error.	
	H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	4
Comments:		

H 2.	**Does the wetland unit have the opportunity to provide habitat for many species?**	**Points**
H 2.1	Buffers ***(see p. 80)***	
	Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within undisturbed part of buffer (*relatively undisturbed also means no grazing, no landscaping, no daily human use*). **Points = 5**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >50% of circumference. **Points = 4**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >25% circumference. **Points = 3**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >50% circumference. **Points = 3**	1
	If buffer does not meet any of the criteria above:	
	☐ No paved areas (except paved trails) or buildings within 25 m (80 feet) of wetland >95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ No paved areas or buildings within 50 m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ Heavy grazing in buffer. **Points = 1**	
	☐ Vegetated buffers are <2 m wide (6.6 feet) for more than 95% of the circumference (e.g., tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0**	
	☑ Buffer does not meet any of the criteria above. **Points = 1**	
	Aerial photo showing buffers **Figure 4**	
H 2.2	Corridors and Connections ***(see p. 81)***	0
H 2.2.1	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (riparian or upland) at least 150 feet wide, has at least 30% cover of shrubs, forest, or native undisturbed prairie, that connects to estuaries, other wetlands, or undisturbed uplands that are at least 250 acres in size? (*Dams in riparian corridors, heavily used gravel roads, and paved roads are considered breaks in the corridor.*)	
	YES = **4 points** (*go to H 2.3*) NO = *go to H 2.2.2*	
H 2.2.2	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (either riparian or upland) at least 50 feet wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands, or undisturbed uplands that are at least 25 acres in size **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above?	
	YES = **2 points** (*go to H 2.3*) NO = *go to H 2.2.3*	
H 2.2.3	Is the wetland:	
	☐ within 5 miles (8 km) of a brackish or salt water estuary **OR**	
	☐ within 3 miles of a large field or pasture > 40 acres in size **OR**	
	☐ within 1 mile of a lake greater than 20 acres in size?	
	YES = **1 point** NO = **0 points**	

Total for page 1

H 2.3	Near or Adjacent to Other Priority Habitats Listed by WDFW ***(see p. 82)***	**Points**

Which of the following priority habitats are within 330 feet (100 m) of the wetland unit?
NOTE: the connections do not have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions

- ☐ **Aspen stands:** Pure or mixed stands of aspen >0.4 ha (1 acre).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over
- ☐ **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 20 trees/ha (8/acre) >81 cm (32 in) dbh or > 200 years of age. (Mature forests) S
- ☐ **Oregon white Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is 25% (*full descrptions in WDFW PHS report p. 158*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each
- ☐ **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*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life hsitory requirements for instream
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coastal Nearshore, and Puget Sound Nearshore. (*full descriptions*
- ☐ **Caves**: 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 7.6 m (25 ft) high and occuring below 5,000 ft.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

4

If wetland has: **3+** priority habitats = **4 points** **1** priority habitat = **1 point**
2 priority habitats = **3 points** No habitats = **0 points**

Note: all vegetated wetlands are by definition a priority habitat but are not included in this list.

Nearby wetlands are addressed in question H 2.4	
Choose the **one** description of the landscape around the wetland that best fits. ☐ There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development). **Points = 5** ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 5** ☑ There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. **Points = 3** ☐ The wetland is Lake-fringe on a lake **with** disturbance, and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 3** ☐ There is at least 1 wetland within 1/2 mile. **Points = 2** ☐ There are no wetlands within 1/2 mile. **Points = 0**	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	8
Total Score for Habitat Functions - add the points for H1 and H2, and record the result on p. 1	12

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and choose the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Check the appropriate Category when the appropriate criteria are met.*	**Category**
SC 1.0 **<u>Estuarine Wetlands</u>** ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = *Go to SC 1.1* ☐ NO - not an estuarine wetland	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = **Category I** ☐ NO = *Go to SC 1.2*	
SC 1.2 Is the wetland unit at least 1 acre in size and meeting at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has <10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover >10% of the wetland, then the wetland should be given a dual rating (I/II). The area of *Spartina* would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of *Spartina* in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or continguous freshwater wetlands. ☐ YES = **Category I** ☐ NO - not an estuarine wetland	

		Category
SC 2.0	**<u>Natural Heritage Wetlands</u>** ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ ☐ YES - contact WNHP/DNR *(see p. 79)* and *go to SC 3.2* ☐ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state Threatened or Endangered plant species? ☐ YES = **Category I** ☐ NO - not a Heritage wetland	
SC 3.0	**<u>Bogs</u>** ***(see p. 87)*** Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetations in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer Yes, you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic oils.) ☐ YES - *go to Q. 3* ☐ NO - *go to Q. 2* 2. Does the unit have organic soils, either peats or mucks, that are <16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES - *go to Q. 3* ☐ NO - not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (>30% of total shrub and herbaceous cover consists of species in Table 3)? ☐ YES - is a bog for purpose of rating ☐ NO - *go to Q. 4* NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (>30% cover) with sitka spruce, subalpine fir, western redcedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of total shrub/herbaceous cover*)? ☐ YES = **Category I** ☐ NO - not a bog for purpose of rating	

		Category
SC 4.0	**Forested Wetlands** ***(see p. 90)***	

Does the wetland unit have at least 1 acre of forest that meets one of these criteria for the Department of Fish and Wildlife's forests as priority habitat? *If you answer Yes, you will still need to rate the wetland based on its functions.*

☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more.

NOTE: The criterion for dbh is based on measurements for upland forests. 200-year-old trees in wetlands will often have a smaller dbh because their growth rates are often smaller. The DFW criterion is an "OR" so old-growth forests do not necessarily have to have trees of this diameter.

☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 - 200 years old OR have average diameters (dbh) exceeding 21 inches (53 cm); 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.

☐ YES = **Category I** ☐ NO - not a forested wetland w/ special characteristics

SC 5.0 **Wetlands in Coastal Lagoons** ***(see p. 91)***

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

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks.

☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (>.5 ppt) during most of the year in at leat a portion of the lagoon (*needs to be measured near the bottom*).

☐ YES = *go to SC 5.1* ☐ NO - not a wetland in a coastal lagoon

SC 5.1 Does the wetland meet all of the following 3 conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).

☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland.

☐ The wetland is larger than 1/10 acre (4,350 square feet).

☐ YES = **Category I** ☐ NO - not a wetland in a coastal lagoon

SC 6.0 **Interdunal Wetlands *(see p. 93)***	**Category**
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - *go to SC 6.1* ☐ NO - not an interdunal wetland for rating ***If you answer Yes, you will still need to rate the wetland based on its functions.*** In practical terms, that means the following geographic areas: • Long Beach Peninsula - lands west of SR 103 • Grayland-Westport - lands west of SR 105 • Ocean Shores-Copalis - lands west of SR 1115 and SR 109. SC 6.1 Is wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? ☐ YES = **Category II** ☐ NO - *go to SC 6.2* SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = **Category III**	
Category of wetland based on Special Characteristics Choose the "highest" rating if wetland falls into several categories, and record on p. 1. If you answered NO for all types, enter "Not Applicable" on p. 1.	

Wetland name or number WTU-1

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WTU-1 Date of site visit: Nov-19

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

HGM Class used for rating Slope 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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	L	L	L	
Landscape Potential	M	M	L	
Value	H	M	H	**Total**
Score Based on Ratings	6	5	5	**16**

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number WTU-1

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

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	1
Hydroperiods	H 1.2	2
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	3
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	3
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	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	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	6

HGM Classification of Wetland in Western Washington

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

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

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

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

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

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

3. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
- ☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

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

4. Does the entire wetland unit **meet all** of the following criteria?
- ☑ The wetland is on a slope (*slope can be very gradual*),
- ☑ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
- ☑ The water leaves the wetland **without being impounded.**

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

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

5. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
- ☐ The overbank flooding occurs at least once every 2 years.

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

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

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

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

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

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

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

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

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

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

Wetland name or number WTU-1

SLOPE WETLANDS

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

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (*a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less — points = 3 Slope is > 1% - 2% — points = 2 Slope is > 2% - 5% — points = 1 Slope is greater than 5% — points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*): Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	0
Total for S 1 — Add the points in the boxes above	**2**

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

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other Sources Yes = 1 No = 0	0
Total for S 2 — Add the points in the boxes above	**1**

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

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

Wetland name or number WTU-1

SLOPE WETLANDS

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

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland — points = 1 All other conditions — points = 0	0

Rating of Site Potential If score is: ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1

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

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2 Surface flooding problems are in a sub-basin farther down-gradient — points = 1 No flooding problems anywhere downstream — points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 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*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WTU-1

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	0
☑ 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

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	2
☑ 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**	

H 1.3. Richness of plant species

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

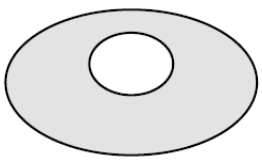
1

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

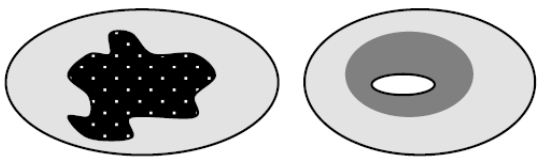
H 1.4. Interspersion of habitats

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. *If you have four or more plant classes or three classes and open water, the rating is always high.*

None = 0 points



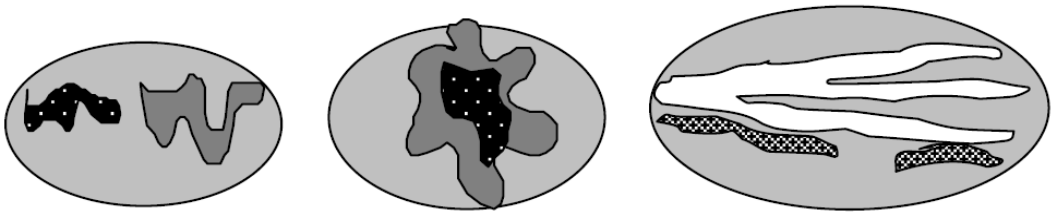
Low = 1 point



Moderate = 2 points

0

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



Wetland name or number WTU-1

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

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

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 0.5 % undisturbed habitat + (0 % 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. *Calculate:* 5 % undisturbed habitat + (5 % moderate & low intensity land uses / 2) = 7.5% 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	0
H 2.3 Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	**-2**

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

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

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

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

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

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name or number WTU-1

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☐ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☐ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☐ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☐ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☐ No = **Is not a bog**	

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

SC 5.0. Wetlands in Coastal Lagoons

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

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

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

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

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

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

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

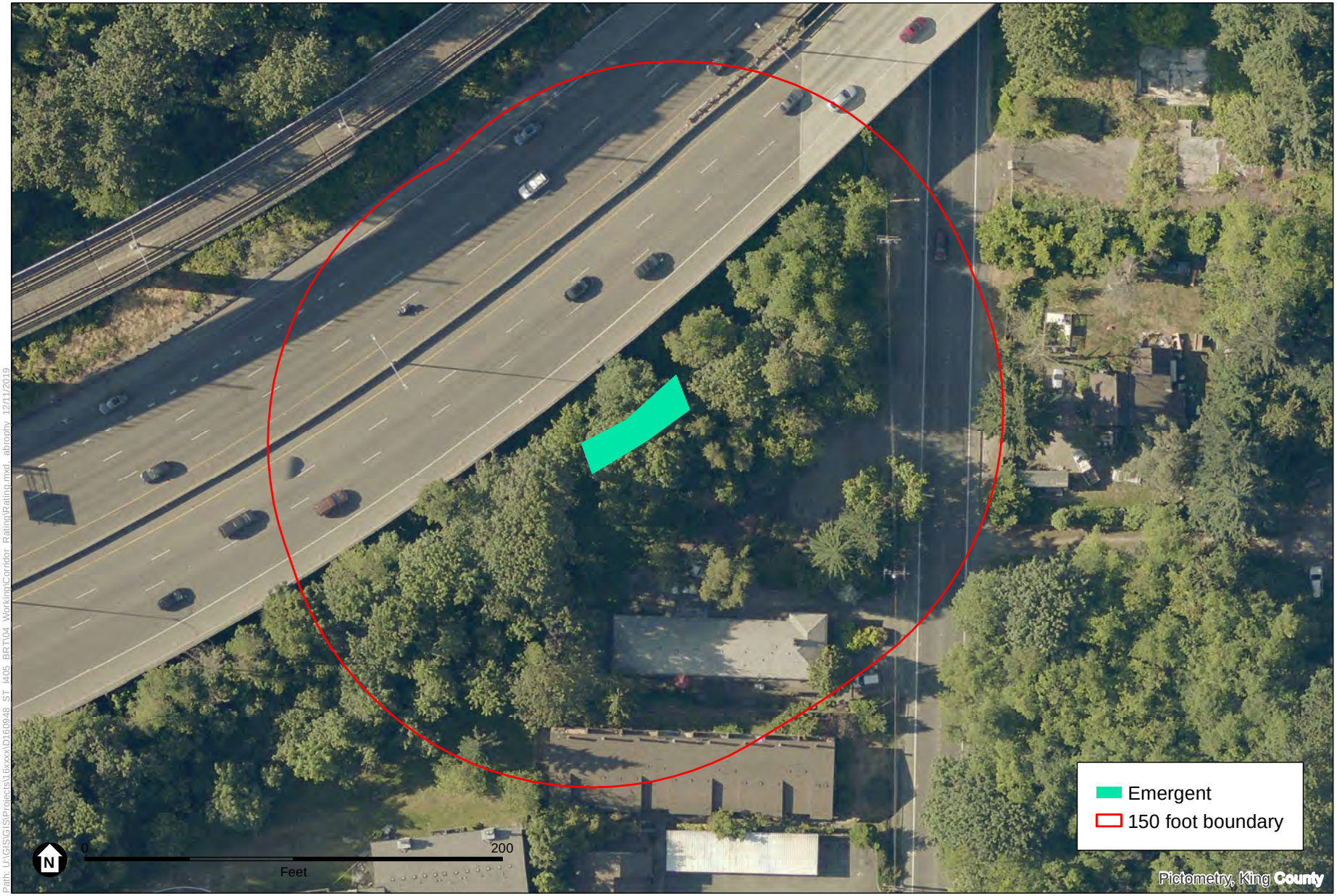
☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

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

Category of wetland based on Special Characteristics

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



I-405 BRT Wetland and Stream Investigation

Figure 1
Wetland WTU-1 - Cowardin plant classes and boundary of area within 150 feet of the wetland
Tukwila, Washington

ESA

Path: U:\GIS\G\S\Projects\16xxxx\D160948_ST_I405_BRT\04_Working\Corridor_Rating\Rating.mxd abrophy 12/4/2019

I-405 BRT Wetland and Stream Investigation

Figure 2
Wetland WTU-1 - hydroperiods and locaiton of outlet
Tukwila, Washington

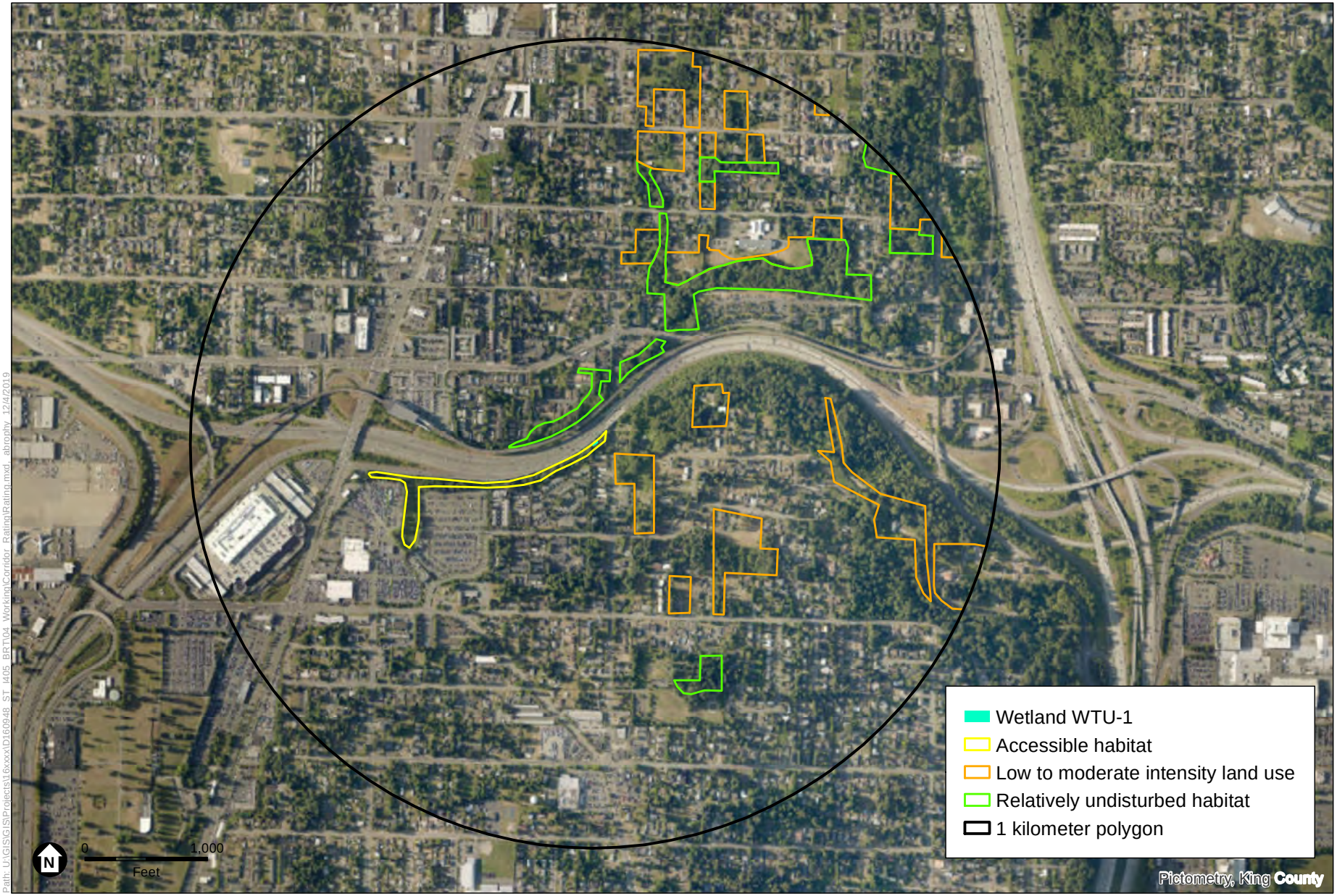
ESA

Path: U:\GIS\GIS\Projects\16xxxx\D160948_ST_I405_BRT\04_Working\Corridor_Ratings\Ratings.mxd, abrophy, 12/4/2019

I-405 BRT Wetland and Stream Investigation

Figure 3
Wetland WTU-1 - plant cover of dense herbaceous plants
Tukwila, Washington

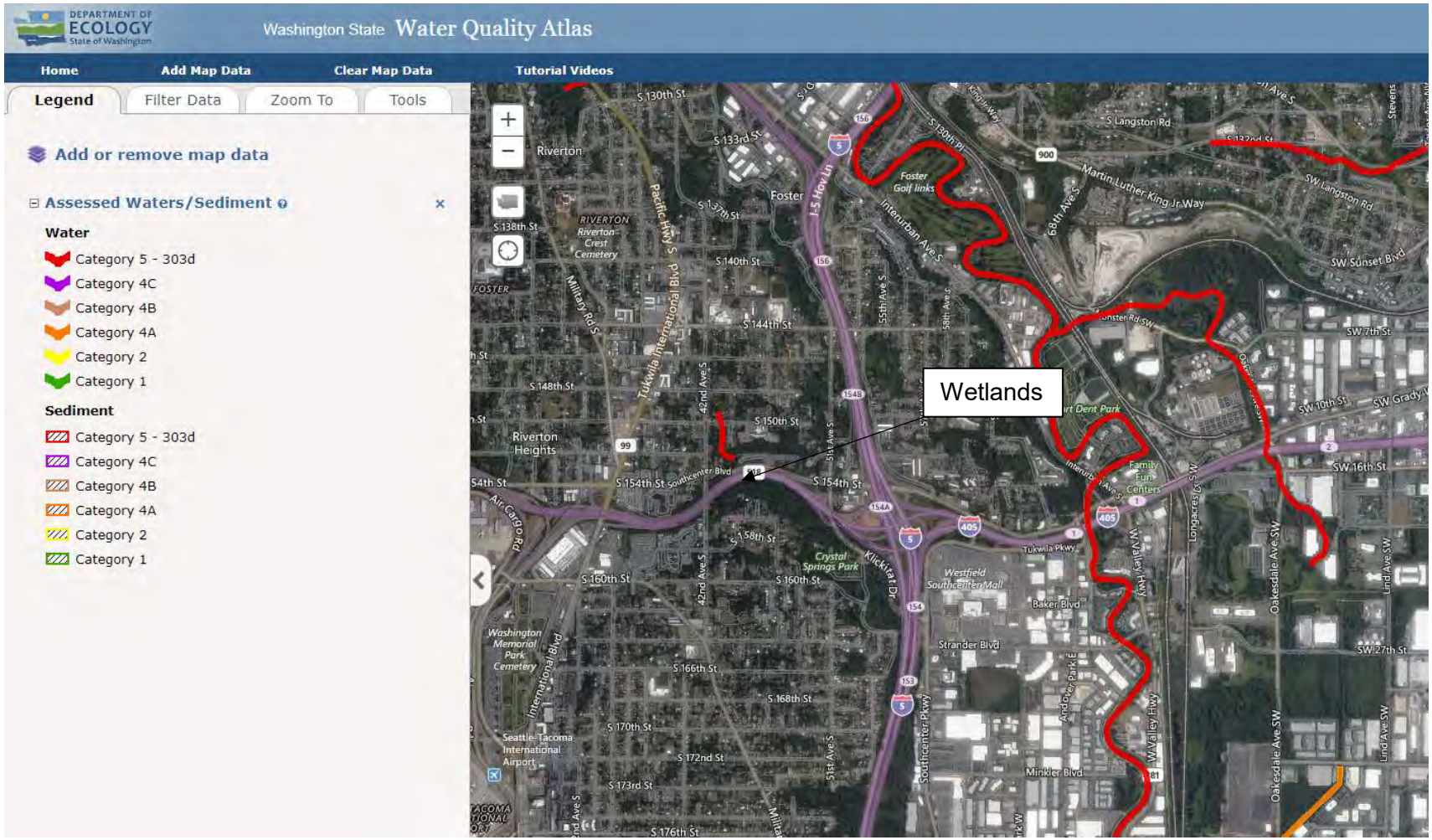
ESA



I-405 BRT Wetland and Stream Investigation

Figure 4
Wetland WTU-1 - accessible and undisturbed habitat within 1 km from the wetland edge
Tukwila, Washington

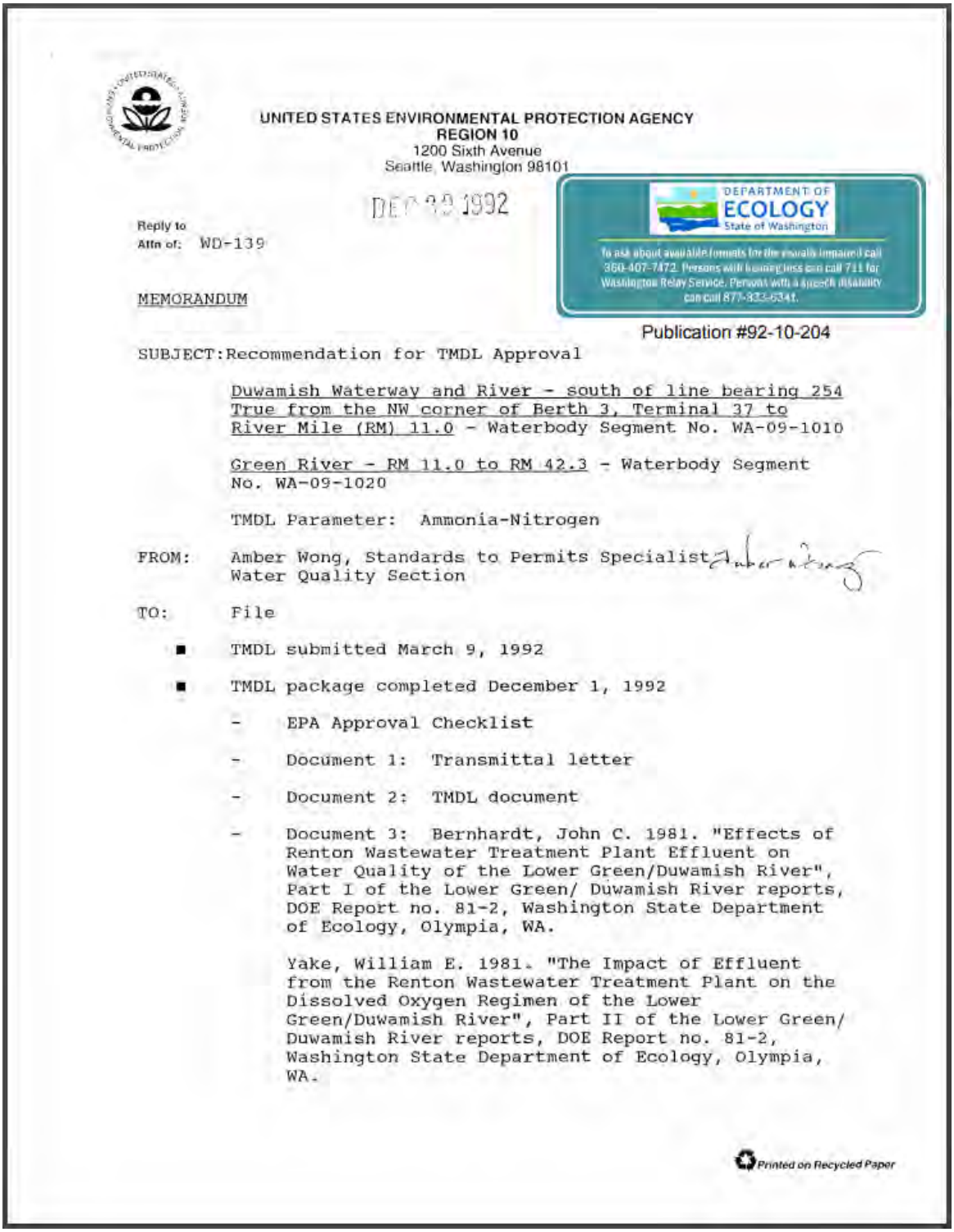
ESA



SOURCE: Ecology 2019a

I-405 BRT Wetland and Stream Investigation

Figure 5
Screen capture of map of 303(d) listed waters in basin



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

DEC 29 1992

Reply to
Attn of: WD-139

DEPARTMENT OF ECOLOGY
State of Washington

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Publication #92-10-204

MEMORANDUM

SUBJECT: Recommendation for TMDL Approval

Duwamish Waterway and River - south of line bearing 254 True from the NW corner of Berth 3, Terminal 37 to River Mile (RM) 11.0 - Waterbody Segment No. WA-09-1010

Green River - RM 11.0 to RM 42.3 - Waterbody Segment No. WA-09-1020

TMDL Parameter: Ammonia-Nitrogen

FROM: Amber Wong, Standards to Permits Specialist
Water Quality Section

TO: File

- TMDL submitted March 9, 1992
- TMDL package completed December 1, 1992
  - EPA Approval Checklist
  - Document 1: Transmittal letter
  - Document 2: TMDL document
  - Document 3: Bernhardt, John C. 1981. "Effects of Renton Wastewater Treatment Plant Effluent on Water Quality of the Lower Green/Duwamish River", Part I of the Lower Green/ Duwamish River reports, DOE Report no. 81-2, Washington State Department of Ecology, Olympia, WA.

    Yake, William E. 1981. "The Impact of Effluent from the Renton Wastewater Treatment Plant on the Dissolved Oxygen Regimen of the Lower Green/Duwamish River", Part II of the Lower Green/ Duwamish River reports, DOE Report no. 81-2, Washington State Department of Ecology, Olympia, WA.

Printed on Recycled Paper

SOURCE: Ecology 2019b

I-405 BRT Wetland and Stream Investigation

Figure 6
Screen capture of TMDLs for WRIA in which unit is found

Wetland name or number: WTU-2

WETLAND RATING FORM - WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): WTU-2 Date of site visit: 9/28/19

Rated by A. Brophy & C.Hersum Trained by Ecology? Yes ☑ No ☐ Date: 10/11/18

SEC: 23 TWNSHP: 23N RNGE: 04E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure _____ **Estimated size:** _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland:

I ☐ **II** ☐ **III** ☑ **IV** ☐

Category I = Score >=70	
Category II = Score 51-69	
Category III = Score 30-50	
Category IV = Score <30	

Score for Water Quality Functions	16
Score for Hydrologic Functions	12
Score for Habitat Functions	19
TOTAL score for functions	**47**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ **II** ☐ **Does not Apply** ☐

Final Category **(choose the "highest" category from above)** **III**

Check the appropriate type and class of wetland being rated.

Wetland Type	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☑

Wetland Class	
Depressional	☑
Riverine	☐
Lake-fringe	☐
Slope	☐
Flats	☐
Freshwater Tidal	☐
Check if unit has multiple HGM classes present	☐

Comments:

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below, you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Special Protection (in addition to the protection recommended for its category)		YES	NO
SP1.	*Has the wetland unit been documented as a habitat for any federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☑
SP2.	*Has the wetland unit been documented as habitat for any state listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).	☐	☑
SP3.	*Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☑
SP4.	*Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☑

To complete the next part of the data sheet, you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, indentify 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 (i.e., except during floods)?

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

If YES, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ YES - **Freshwater Tidal Fringe** ☐ NO - **Saltwater Tidal Fringe (Estuarine)**

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 rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Saltwater Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is being kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. xx).

2. The entire wetland unit is flat and precipitation is 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 both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 feet (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.**

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 feet in diameter and less than 1 foot deep).*

☑ NO - go to 5 ☐ YES - the wetland class is **Slope**

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 once every two years.

☑ NO - go to 6 ☐ YES - the wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 ground water 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 within your wetland. 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 being rated. If the area of the second class is less than 10% of the unit, classify the wetland using the class that represent more than 90% of the total area.

HGM Classes Within a Delineated Wetland Boundary	***Class to Use in Rating***	
Slope + Riverine	Riverine	☐
Slope + Depressional	Depressional	☐
Slope + Lake-fringe	Lake-fringe	☐
Depressional + Riverine along stream within boundary	Depressional	☐
Depressional + Lake-fringe	Depressional	☐
Saltwater Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics	☐

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

D Depressional and Flats Wetlands

WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality.

		Points
D 1.	**Does the wetland unit have the <u>potential</u> to improve water quality? *(see p. 38)***	**Points**
D 1.1	Characteristics of surface water flows out of the wetland: ☐ Unit is a depression with no surface water leaving it (no outlet) **Points = 3** ☐ Unit has an intermittently flowing, or highly constricted permanently flowing outlet. **Points = 2** ☑ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*). **Points = 1** ☐ Unit is a flat depression (Q. 7 on key) or in the Flats class, with permenent surface outflow and **no obvious natural outlet** and/or outlet is a man-made ditch. (If ditch is not permanently flowing, treat unit as "intermittently flowing.") **Points = 1** Provide photo or drawing	1 **Figure 8**
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions): ☐ YES **Points = 4** ☑ NO **Points = 0**	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): ☐ Wetland has persistent, ungrazed vegetation >=95% of area. **Points = 5** ☑ Wetland has persistent, ungrazed vegetation >=1/2 of area. **Points = 3** ☐ Wetland has persistent, ungrazed vegetation >=1/10 of area. **Points = 1** ☐ Wetland has persistent, ungrazed vegetation <1/10 of area **Points = 0** Map of Cowardin vegetation classes	3 **Figure 7**
D 1.4	Characteristics of seasonal ponding or inundation. *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* ☑ Area seasonally ponded is >1/2 total area of wetland. **Points = 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** Map of hydroperiods	4 **Figure 8**
	Total for D 1 *Add the points in the boxes above*	8

D 2.	**Does the wetland unit have the <u>opportunity</u> to improve water quality? *(see p. 44)*** Answer YES if you know or believe there are pollutants in ground water or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes, or ground water downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants:* ☐ Grazing in the wetland or within 150 feet. ☐ Untreated stormwater discharges to wetland. ☐ Tilled fields or orchards within 150 feet of wetland. ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging. ☑ Residential, urban areas, golf courses are within 150 feet of wetland. ☐ Wetland is fed by ground water high in phosphorus or nitrogen. ☐ Other: _____ YES - multiplier is **2** NO - multiplier is **1**	Multiplier 2
TOTAL - Water Quality Functions	Multiply the score from D 1. by D 2. ***Add score to table on p. 1***	16

D Depressional and Flats Wetlands

HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding/stream degradation.

D 3. Does wetland unit have the potential to reduce flooding/erosion? *(see p. 46)*		**Points**
D 3.1 Characteristics of surface water flows out of the wetland:		0
☐ Unit is a depression with no surface water leaving it (no outlet).	**Points = 4**	
☐ Unit has an intermittently flowing, **OR** highly constricted permanently flowing outlet.	**Points = 2**	
☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and **no obvious natural outlet** and/or outlet is a man-made ditch. (*If ditch is not permanently flowing, treat unit at "intermittently flowing.")*	**Points = 1**	
☑ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*).	**Points = 0**	
D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).*		3
☐ Marks of ponding are 3 feet or more above the surface or bottom of outlet.	**Points = 7**	
☐ The wetland is a "headwater" wetland.	**Points = 5**	
☑ Marks of ponding between 2 feet to <3 feet from surface or bottom of outlet.	**Points = 5**	
☐ Marks are at least 0.5 feet to <2 feet from surface or bottom of outlet.	**Points = 3**	
☐ Wetland is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water.	**Points = 1**	
☐ Marks of ponding are less than 0.5 feet.	**Points = 0**	
D 3.3 Contribution of 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 itself.*		3
☐ The area of the basin is <10 times the area of the unit.	**Points = 5**	
☑ The area of the basin is 10 to 100 times the area of the unit.	**Points = 3**	
☐ The area of the basin is >100 times the area of the unit.	**Points = 0**	
☐ Entire unit is in the **Flats** class (basin=wetland)	**Points = 5**	
Total for D 3	*Add the points in the boxes above*	6

D 4. Does wetland unit have the opportunity to reduce flooding/erosion? *(see p. 49)*		
Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows.		
Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir, etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur.		
Note which of the following indicators of opportunity apply:		
☐ Wetland is in a headwater of a river or stream that has flooding problems.		
☑ Wetland drains to a river or stream that has flooding problems.		
☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems.		Multiplier
☐ Other:		2
YES - multiplier is **2**	NO - multiplier is **1**	
TOTAL - Hydrologic Functions	Multiply the score from D 3. by D 4. ***Add score to table on p. 1***	12

These questions apply to wetlands of all HGM classes

HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat.

H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? — **Points**

H 1.1 <u>Vegetation structure</u> ***(see p. 72)***

Check the types of vegetation classes present (as defined by Cowardin). Size threshold for class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.

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

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

Add the number of vegetation types that qualify. If you have:

4 structures or more	**Points = 4**
3 structures	**Points = 2**
2 structures	**Points = 1**
1 structure	**Points = 0**

Map of Cowardin classes — **Figure 7**

Points: 2

H 1.2 <u>Hydroperiods</u> ***(see p. 73)***

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if less than 2.5 acres in size or 1/4 acre to count (see text for descriptions of hydroperiods).

☑ Permanently flooded or inundated	4 or more types present	**Points = 3**
☑ Seasonally flooded or inundated	3 types present	**Points = 2**
☐ Occasionally flooded or inundated	2 types present	**Points = 1**
☑ Saturated only	1 type present	**Points = 0**

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

Map of hydroperiods — **Figure 8**

Points: 3

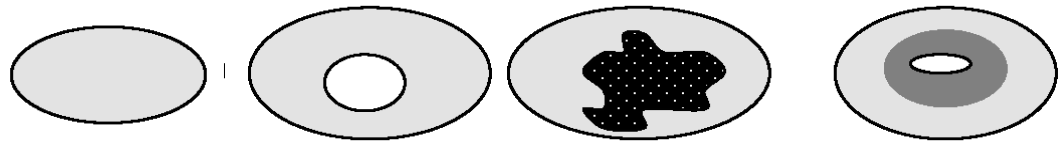
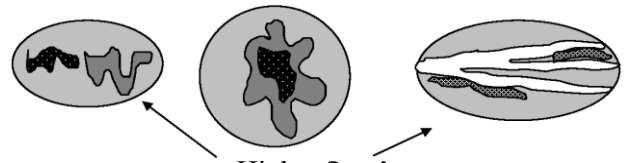
H 1.3 <u>Richness of Plant Species</u> ***(see p. 75)***

Count the number of plant species in the wetland that cover at least 10 sq. ft. (different patches of the same species can be combined to meet the size threshold). 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**
List species below if you want to:	<5 species	**Points = 0**

Points: 2

Total for page: 7

		Points
H 1.4	Interspersion of Habitats ***(see p. 76)*** *Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1) or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.*  None = **0 points** Low = **1 point** Moderate = **2 points**  [riparian braided channels] High = **3 points** NOTE: If you have four or more vegetation types or three vegetation types and open water, the rating is always "high". **Use map of Cowardin vegetation classes.**	2
H 1.5	Special Habitat Features ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4 inches in diameter and 6 feet long). ☑ Standing snags (diameter at the bottom >4 inches) in the wetland. ☐ Undercut banks are present for at least 6.6 feet (2 m) and/or overhanging vegetation extends at least 3.3 feet (1 m) over a stream (or ditch) in or contiguous with the wetland, for at least 33 feet (10 m). ☐ Stable steep banks of fine material that might be used by beaver/muskrat for denning (>30° slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet turned brown/gray*). ☐ At least 1/4 acre of thin-stemmed presistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*). ☑ Invasive plants cover less than 25% of the wetland area in each stratum of plants. *Note: The 20% stated in early printings of the manual on page 78 is an error.*	3
	H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	12
Comments:		

H 2.	**Does the wetland unit have the opportunity to provide habitat for many species?**	**Points**
H 2.1	Buffers ***(see p. 80)***	
	Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within undisturbed part of buffer (*relatively undisturbed also means no grazing, no landscaping, no daily human use*). **Points = 5**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >50% of circumference. **Points = 4**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >25% circumference. **Points = 3**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >50% circumference. **Points = 3**	1
	If buffer does not meet any of the criteria above:	
	☐ No paved areas (except paved trails) or buildings within 25 m (80 feet) of wetland >95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ No paved areas or buildings within 50 m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ Heavy grazing in buffer. **Points = 1**	
	☐ Vegetated buffers are <2 m wide (6.6 feet) for more than 95% of the circumference (e.g., tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0**	
	☑ Buffer does not meet any of the criteria above. **Points = 1**	
	Aerial photo showing buffers **Figure 10**	
H 2.2	Corridors and Connections ***(see p. 81)***	0
H 2.2.1	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (riparian or upland) at least 150 feet wide, has at least 30% cover of shrubs, forest, or native undisturbed prairie, that connects to estuaries, other wetlands, or undisturbed uplands that are at least 250 acres in size? (*Dams in riparian corridors, heavily used gravel roads, and paved roads are considered breaks in the corridor.*)	
	YES = **4 points** (*go to H 2.3*) NO = *go to H 2.2.2*	
H 2.2.2	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (either riparian or upland) at least 50 feet wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands, or undisturbed uplands that are at least 25 acres in size **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above?	
	YES = **2 points** (*go to H 2.3*) NO = *go to H 2.2.3*	
H 2.2.3	Is the wetland: ☐ within 5 miles (8 km) of a brackish or salt water estuary **OR** ☐ within 3 miles of a large field or pasture > 40 acres in size **OR** ☐ within 1 mile of a lake greater than 20 acres in size? YES = **1 point** NO = **0 points**	

Total for page 1

H 2.3	Near or Adjacent to Other Priority Habitats Listed by WDFW ***(see p. 82)***	**Points**

Which of the following priority habitats are within 330 feet (100 m) of the wetland unit?
NOTE: the connections do not have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions

- ☐ **Aspen stands:** Pure or mixed stands of aspen >0.4 ha (1 acre).
- ☐ **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 p. 152*).
- ☐ **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 20 trees/ha (8/acre) >81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadance, 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 25% (*full descrptions in WDFW PHS report p. 158*).
- ☑ **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*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life hsitory requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coastal Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report pp. 167-169 and glossary in Appendix A).*
- ☐ **Caves**: 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 7.6 m (25 ft) high and occuring below 5,000 ft.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

3

If wetland has: **3+** priority habitats = **4 points** **1** priority habitat = **1 point**
2 priority habitats = **3 points** No habitats = **0 points**

Note: all vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4

H 2.4	Wetland Landscape ***(see p. 84)***	**Points**
	*Choose the **one** description of the landscape around the wetland that best fits.*	
	☐ There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development). **Points = 5**	3
	☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 5**	
	☑ There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. **Points = 3**	
	☐ The wetland is Lake-fringe on a lake **with** disturbance, and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 3**	
	☐ There is at least 1 wetland within 1/2 mile. **Points = 2**	
	☐ There are no wetlands within 1/2 mile. **Points = 0**	
	H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	7
Total Score for Habitat Functions - add the points for H1 and H2, and record the result on p. 1		19

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and choose the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Check the appropriate Category when the appropriate criteria are met.*	**Category**
SC 1.0 **<u>Estuarine Wetlands</u>** ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = *Go to SC 1.1* ☐ NO - not an estuarine wetland	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = **Category I** ☐ NO = *Go to SC 1.2*	
SC 1.2 Is the wetland unit at least 1 acre in size and meeting at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has <10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover >10% of the wetland, then the wetland should be given a dual rating (I/II). The area of *Spartina* would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of *Spartina* in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or continguous freshwater wetlands. ☐ YES = **Category I** ☐ NO = **Category II**	

		Category
SC 2.0	**<u>Natural Heritage Wetlands</u>** ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ ☐ YES - contact WNHP/DNR *(see p. 79)* and *go to SC 3.2* ☐ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state Threatened or Endangered plant species? ☐ YES = **Category I** ☐ NO - not a Heritage wetland	
SC 3.0	**<u>Bogs</u>** ***(see p. 87)*** Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer Yes, you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic oils.) ☐ YES - *go to Q. 3* ☐ NO - *go to Q. 2* 2. Does the unit have organic soils, either peats or mucks, that are <16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES - *go to Q. 3* ☐ NO - not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (>30% of total shrub and herbaceous cover consists of species in Table 3)? ☐ YES - is a bog for purpose of rating ☐ NO - *go to Q. 4* NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (>30% cover) with sitka spruce, subalpine fir, western redcedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of total shrub/herbaceous cover*)? ☐ YES - **Category I** ☐ NO - not a bog for purpose of rating	

		Category
SC 4.0	**<u>Forested Wetlands</u>** ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meets one of these criteria for the Department of Fish and Wildlife's forests as priority habitat? *If you answer Yes, you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. 200-year-old trees in wetlands will often have a smaller dbh because their growth rates are often smaller. The DFW criterion is an "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 - 200 years old OR have average diameters (dbh) exceeding 21 inches (53 cm); 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. ☐ YES = **Category I** ☐ NO - not a forested wetland w/ special characteristics	
SC 5.0	**<u>Wetlands in Coastal Lagoons</u>** ***(see p. 91)*** Does the wetland meet all of the following criteria of a wtland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (>.5 ppt) during most of the year in at leat a portion of the lagoon (*needs to be measured near the bottom*). ☐ YES = *go to SC 5.1* ☐ NO - not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following 3 conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland is larger than 1/10 acre (4,350 square feet). ☐ YES = **Category I** ☐ NO = **Category II**	

SC 6.0 **Interdunal Wetlands** ***(see p. 93)***	Category
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - *go to SC 6.1* ☐ NO - not an interdunal wetland for rating ***If you answer YES, you will still need to rate the wetland based on its functions.*** In practical terms, that means the following geographic areas: • Long Beach Peninsula - lands west of SR 103 • Grayland-Westport - lands west of SR 105 • Ocean Shores-Copalis - lands west of SR 1115 and SR 109. SC 6.1 Is wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? ☐ YES = **Category II** ☐ NO - *go to SC 6.2* SC 6.2 Is the wetland unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = **Category III**	
Category of wetland based on Special Characteristics Choose the "highest" rating if wetland falls into several categories, and record on p. 1. If you answered NO for all types, enter "Not Applicable" on p. 1.	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WTU-2 Date of site visit: 9/28/2019

Rated by A. Brophy Trained by Ecology? ☑ Yes ☐ No Date of training 10/11/21018

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			List appropriate rating (H, M, L)	
Site Potential	M	M	M	
Landscape Potential	M	M	L	
Value	H	M	M	**Total**
Score Based on Ratings	7	6	5	**18**

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

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

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetland in Western Washington

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

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

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

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

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

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

3. Does the entire wetland unit **meet all** of the following criteria?
☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

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

4. Does the entire wetland unit **meet all** of the following criteria?
☐ The wetland is on a slope (*slope can be very gradual*),
☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
☐ The water leaves the wetland **without being impounded.**

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

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

5. Does the entire wetland unit **meet all** of the following criteria?
☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
☐ The overbank flooding occurs at least once every 2 years.

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:

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 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☑ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	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 Wetland has persistent, ungrazed, plants > ½ 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	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 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 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? Source Yes = 1 No = 0	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*)? Yes = 2 No = 0	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. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	0
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☐ The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire wetland is in the Flats class points = 5	3
Total for D 4 — Add the points in the boxes above	**6**

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 ☑ ● Surface flooding problems are in a sub-basin farther down-gradient. points = 1 ☐ Flooding from groundwater is an issue in the sub-basin. points = 1 ☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why points = 0 ☐ There are no problems with flooding downstream of the wetland. points = 0	1
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	2
☑ 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

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	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**	

H 1.3. Richness of plant species

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

2

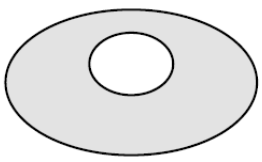
If you counted:	> 19 species	points = 2
	5 - 19 species	points = 1
	< 5 species	points = 0

H 1.4. Interspersion of habitats

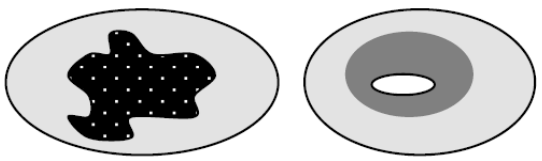
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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

2

None = 0 points

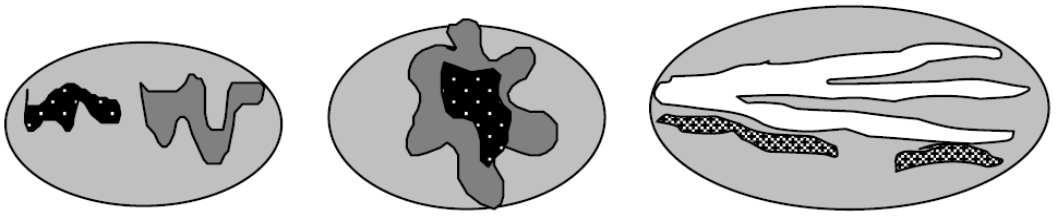


Low = 1 point



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. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☑ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☑ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	3
Total for H 1 Add the points in the boxes above	**12**

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

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 5 % undisturbed habitat + (2 % moderate & low intensity land uses / 2) = 6% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 10 % undisturbed habitat + (5 % moderate & low intensity land uses / 2) = 12.5% 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	-2
Total for H 2 Add the points in the boxes above	**-1**

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

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

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

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

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

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☐ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☐ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☐ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☐ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☐ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☐ No = **Is not a bog**	

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

SC 5.0. Wetlands in Coastal Lagoons

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

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

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

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

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

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

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

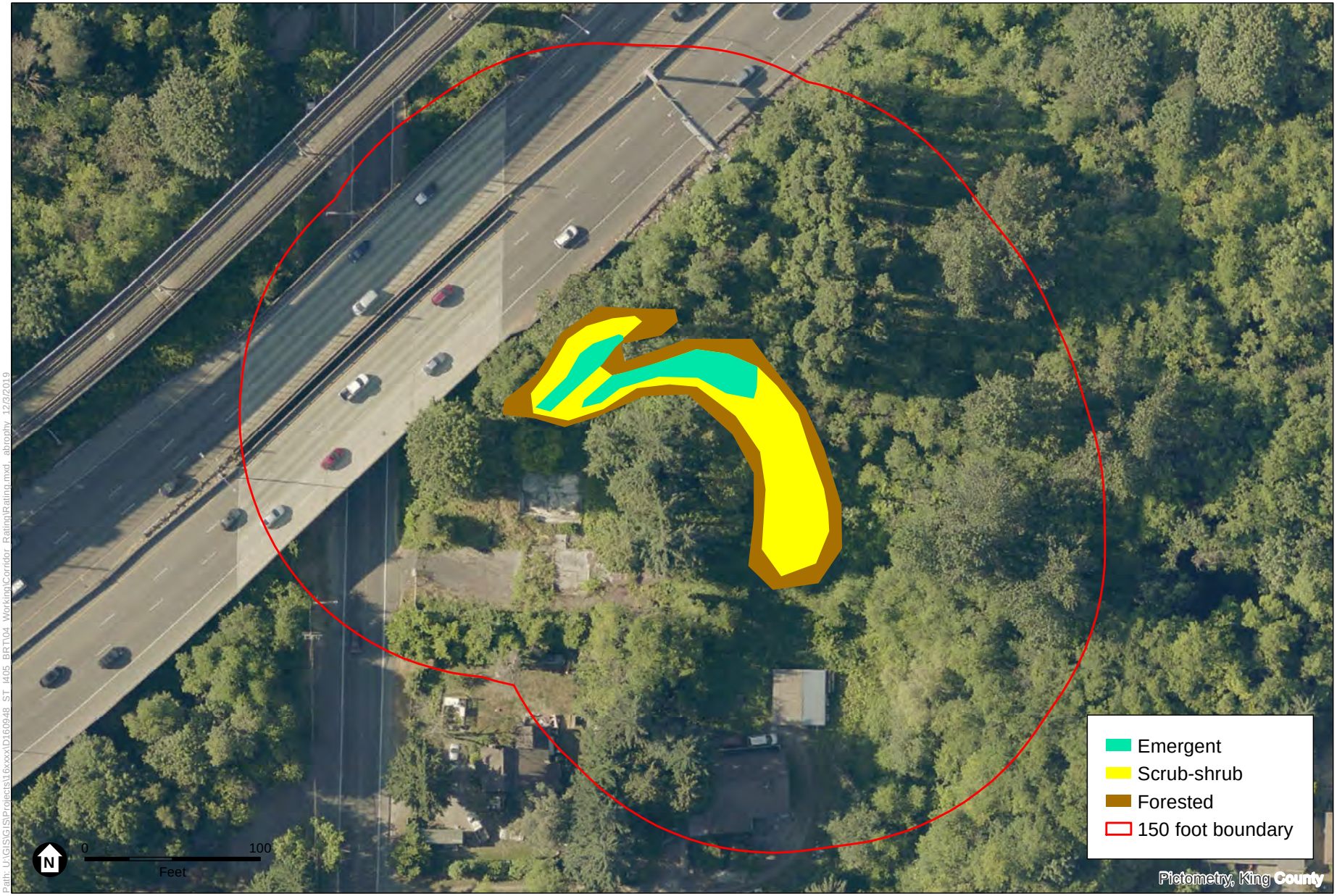
☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

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

Category of wetland based on Special Characteristics

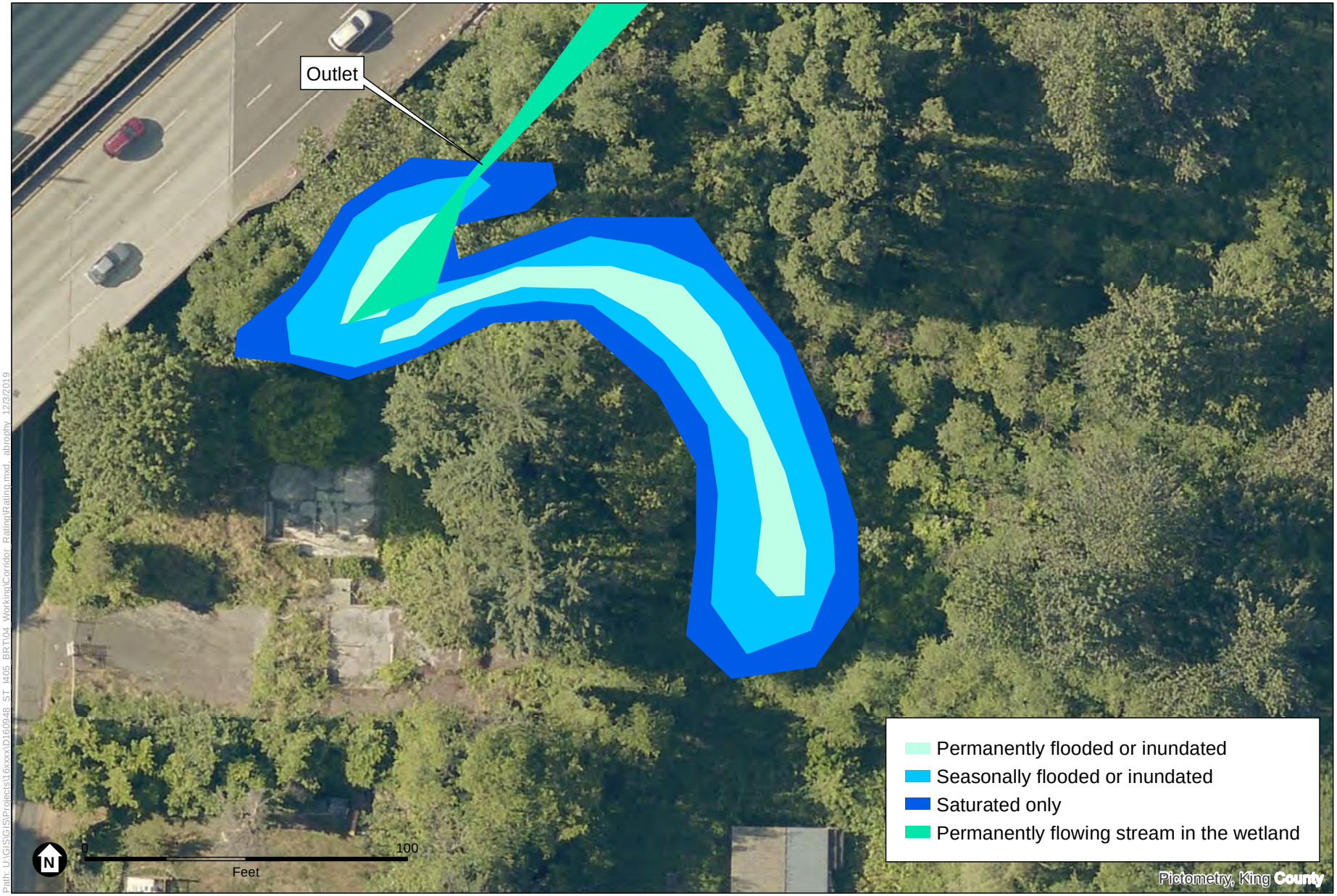
If you answered No for all types, enter "Not Applicable" on Summary Form



I-405 BRT Wetland and Stream Investigation

Figure 7
Wetland WTU-2 - Cowardin plant classes and boundary of area within 150 feet of the wetland
Tukwila, Washington

ESA



I-405 BRT Wetland and Stream Investigation

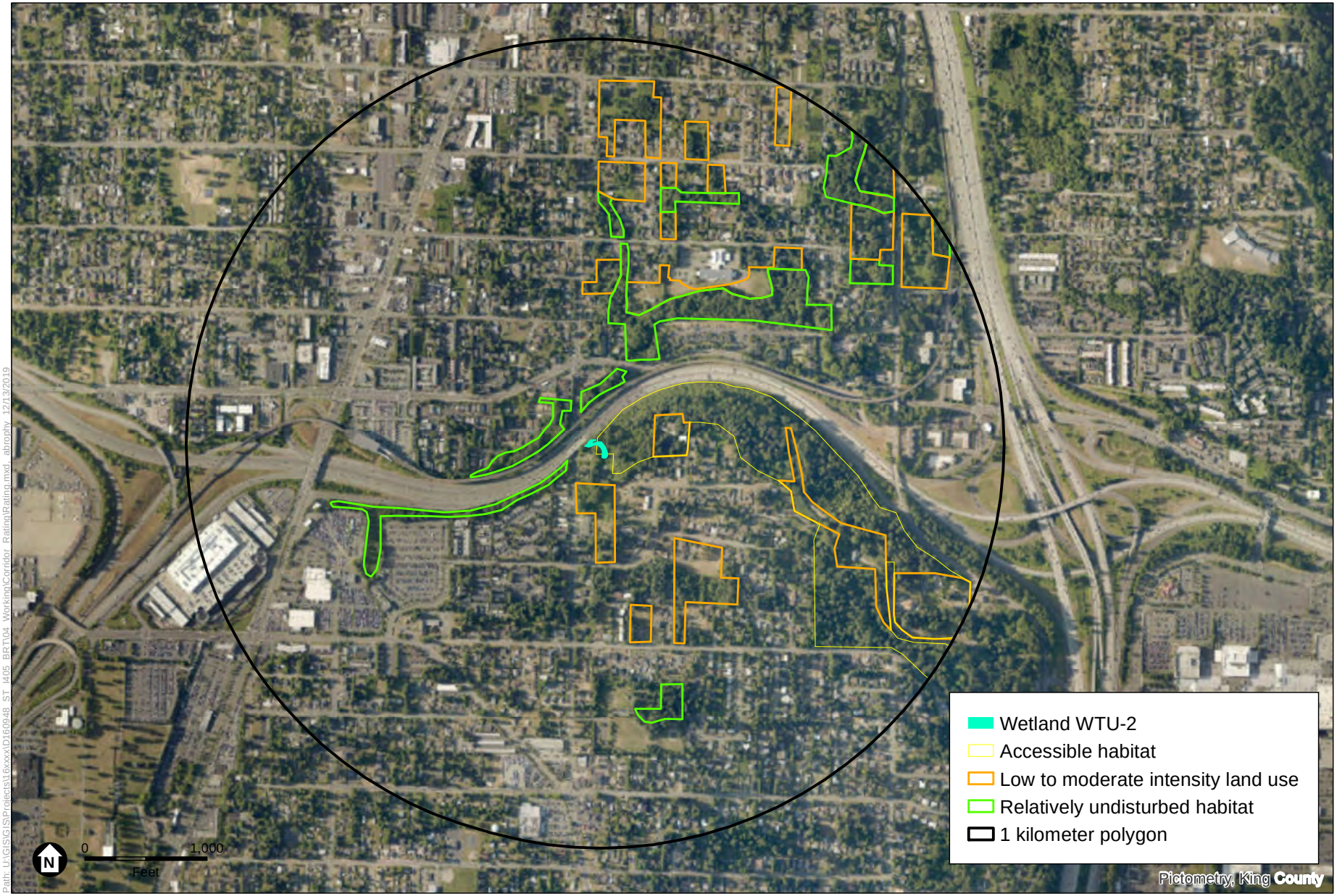
Figure 8
Wetland WTU-2 - hydroperiods and location of outlet
Tukwila, Washington

ESA

I-405 BRT Wetland and Stream Investigation

Figure 9
Wetland WTU-2 - contributing basin
Tukwila, Washington

ESA



I-405 BRT Wetland and Stream Investigation

Figure 10
Wetland WTU-2 - accessible and undisturbed habitat within 1 km from the wetland edge
Tukwila, Washington

ESA

Wetland name or number: WTU-3

WETLAND RATING FORM - WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): WTU-3 Date of site visit: 11/22/19

Rated by A. Brophy & C.Hersum Trained by Ecology? Yes ☑ No ☐ Date: 10/11/18

SEC: 23 TWNSHP: 23N RNGE: 04E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure _____ **Estimated size:** _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland:

I ☐ **II** ☐ **III** ☐ **IV** ☑

Category I = Score >=70	
Category II = Score 51-69	
Category III = Score 30-50	
Category IV = Score <30	

Score for Water Quality Functions	4
Score for Hydrologic Functions	6
Score for Habitat Functions	19
TOTAL score for functions	**29**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ **II** ☐ **Does not Apply** ☑

Final Category **(choose the "highest" category from above)** **IV**

Check the appropriate type and class of wetland being rated.

Wetland Type	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☑

Wetland Class	
Depressional	☐
Riverine	☐
Lake-fringe	☐
Slope	☑
Flats	☐
Freshwater Tidal	☐
Check if multiple HGM classes are present	☐

Comments:

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below, you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Special Protection (in addition to the protection recommended for its category)		YES	NO
SP1.	*Has the wetland unit been documented as a habitat for any federally listed Threatened or Endangered (T/E)* ***plant or animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☑
SP2.	*Has the wetland unit been documented as habitat for any state listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands.	☐	☑
SP3.	*Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☑
SP4.	*Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☑

To complete the next part of the data sheet, you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, indentify 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 (i.e., except during floods)?

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

If YES, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ YES - **Freshwater Tidal Fringe** ☐ NO - **Saltwater Tidal Fringe (Estuarine)**

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 rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Saltwater Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is being kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. xx).

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

☑ 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 both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) where at least 20 acres (8 ha) are permanently inundated (ponded or flooded);

☐ At least 30% of the open water area is deeper than 6.6 feet (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.**

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 feet in diameter and less than 1 foot deep).*

☐ NO - go to 5 ☑ YES - the wetland class is **Slope**

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 once every two years.

☐ NO - go to 6 ☐ YES - the wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 stream or river running through it and providing water? The unit seems to be maintained by higher ground water 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 your wetland. 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 second class 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 a Delineated Wetland Boundary	***Class to Use in Rating***	
Slope + Riverine	Riverine	☐
Slope + Depressional	Depressional	☐
Slope + Lake-fringe	Lake-fringe	☐
Depressional + Riverine along stream within boundary	Depressional	☐
Depressional + Lake-fringe	Depressional	☐
Saltwater Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics	☐

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

S Slope Wetlands

WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality.

		Points
S 1.	**Does the wetland unit have the <u>potential</u> to improve water quality? *(see p. 64)***	**Points**
S 1.1	Characteristics of average slope of the unit: ☐ Slope is 1% or less (*a 1% slope has a 1-foot vertical drop for every 100 ft. horizontal distance*) **Points = 3** ☐ Slope is 1% - 2% **Points = 2** ☐ Slope is 1% - 5% **Points = 1** ☑ Slope is greater than 5% **Points = 0**	0
S 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES = 3 points NO = 0 points	0
S 1.3	Characteristics of the vegetation in the wetland that trap sediments and pollutants: *choose the points appropriate for the description that best fits vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* Dense, uncut, herbaceous vegetation >90% of wetland area **Points = 6** Dense, uncut, herbaceous vegetation >1/2 of wetland area **Points = 3** Dense, woody vegetation >1/2 of wetland area **Points = 2** Dense, uncut, herbaceous vegetation >1/4 of wetland area **Points = 1** Does not meet any of the criteria above for vegetation **Points = 0**	2
	Aerial photo or map with vegetation polygons	**Figure 13**
	Total for S 1 *Add the points in the boxes above*	2
S 2.	**Does the wetland unit have the <u>opportunity</u> to improve water quality? *(see p. 67)*** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes, or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources but any single source would qualify as an opportunity.* ☐ Grazing in the wetland or within 150 feet of the wetland ☐ Untreated stormwater discharges to the wetland ☐ Tilled fields, logging, or orchards within 150 feet of the wetland ☑ Residential, urban areas, or golf courses are within 150 feet upslope of wetland ☐ Other: _____	Multiplier 2
	YES - multiplier is **2** NO - multiplier is **1**	
TOTAL - Water Quality Functions	Multiply the score from S 1. by S 2. ***Add score to table on p. 1***	4

S Slope Wetlands

HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding and stream erosion.

		Points
S 3.	**Does wetland unit have the <u>potential</u> to reduce flooding/erosion?** ***(see p. 68)***	
S 3.1	Characteristics of vegetation that reduce the velocity of surface flows during storms. *Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have truoble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.* ☐ Dense, uncut, **rigid** vegetation covers >90% of wetland area **Points = 6** ☐ Dense, uncut, **rigid** vegetation covers >1/2 of wetland area **Points = 3** ☑ Dense, uncut, **rigid** vegetation covers >1/4 of wetland area **Points = 1** ☐ More than 3/4 of area is grazed, mowed, tilled, or vegetation is not rigid **Points = 0**	1
S 3.2	Characteristics of the slope wetland that holds back small amounts of flood flows: *the slope wetland has small surface depressions that can retain water over at least 10% of its area* YES = **2 points** NO = **0 points**	2
	Record the points from the boxes above	3
S 4.	**Does wetland unit have the opportunity to reduce flooding and erosion?** ***(see p. 70)***	
	Is the wetland in a landscape position where the reduction in water velocity it provides help to protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.* ☑ Wetland has surface runoff that drains to a river or stream that has flooding problems ☐ Other: _____	Multiplier
	YES - multiplier is **2** NO - multiplier is **1**	2
TOTAL - Hydrologic Functions	Multiply the score from S 3. by S 4. ***Add score to table on p. 1***	6

These questions apply to wetlands of all HGM classes

HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat.

H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? — **Points**

H 1.1 <u>Vegetation structure</u> ***(see p. 72)***

Check the types of vegetation classes present (as defined by Cowardin). Size threshold for class is 1/4 acre or more than 10% of the areaif unit is smaller than 2.5 acres.

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

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.

Add the number of vegetation types that qualify. If you have:

4 structures or more **Points = 4**
3 structures **Points = 2**
2 structures **Points = 1**
1 structure **Points = 0**

Map of Cowardin vegetation classes **Figure 11**

Points: 2

H 1.2 <u>Hydroperiods</u> ***(see p. 73)***

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if less than 2.5 acres in size or 1/4 acre to count (see text for descriptions of hydroperiods).

- ☑ Permanently flooded or inundated — 4 or more types present **Points = 3**
- ☑ Seasonally flooded or inundated — 3 types present **Points = 2**
- ☐ Occasionally flooded or inundated — 2 types present **Points = 1**
- ☑ Saturated only — 1 type present **Points = 0**
- ☑ Permanently flowing stream or river in, or adjacent to, the wetland
- ☐ Seasonally flowing stream in, or adjacent to, the wetland
- ☐ ***Lake-fringe wetland = 2 points***
- ☐ ***Freshwater tidal wetland = 2 points***

Map of hydroperiods **Figure 12**

Points: 3

H 1.3 <u>Richness of Plant Species</u> ***(see p. 75)***

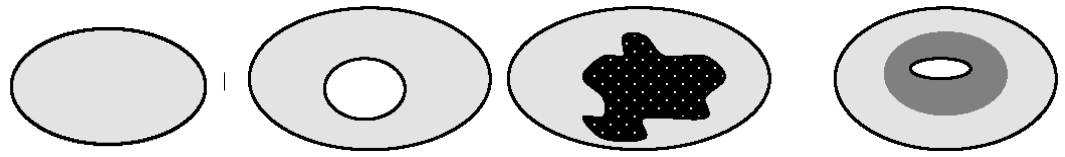
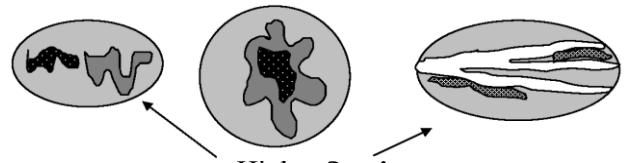
Count the number of plant species in the wetland that cover at least 10 sq. ft. (different patches of the same species can be combined to meet the size threshold). You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle.

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

List species below if you want to:

Points: 1

Total for page: **6**

		Points
H 1.4	Interspersion of Habitats ***(see p. 76)*** *Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1) or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.*  None = **0 points** Low = **1 point** Moderate = **2 points**  [riparian braided channels] High = **3 points** NOTE: If you have four or more vegetation types or three vegetation types and open water, the rating is always "high". **Use map of Cowardin vegetation classes.**	3
H 1.5	Special Habitat Features ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☑ Large, downed, woody debris within the wetland (>4 inches in diameter and 6 feet long). ☑ Standing snags (diameter at the bottom >4 inches) in the wetland. ☐ Undercut banks are present for at least 6.6 feet (2 m) and/or overhanging vegetation extends at least 3.3 feet (1 m) over a stream (or ditch) in or contiguous with the wetland, for at least 33 feet (10 m). ☐ Stable steep banks of fine material that might be used by beaver/muskrat for denning (>30° slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet turned brown/gray*). ☐ At least 1/4 acre of thin-stemmed presistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*). ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants. *Note: The 20% stated in early printings of the manual on page 78 is an error.*	2
	H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	11

Comments:

H 2.	**Does the wetland unit have the opportunity to provide habitat for many species?**	**Points**
H 2.1	Buffers ***(see p. 80)***	
	Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within undisturbed part of buffer (*relatively undisturbed also means no grazing, no landscaping, no daily human use*). **Points = 5**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >50% of circumference. **Points = 4**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >25% circumference. **Points = 3**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >50% circumference. **Points = 3**	1
	If buffer does not meet any of the criteria above:	
	☐ No paved areas (except paved trails) or buildings within 25 m (80 feet) of wetland >95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ No paved areas or buildings within 50 m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ Heavy grazing in buffer. **Points = 1**	
	☐ Vegetated buffers are <2 m wide (6.6 feet) for more than 95% of the circumference (e.g., tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0**	
	☑ Buffer does not meet any of the criteria above. **Points = 1**	
	Aerial photo showing buffers **Figure 14**	

H 2.2	Corridors and Connections ***(see p. 81)***	0
H 2.2.1	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (riparian or upland) at least 150 feet wide, has at least 30% cover of shrubs, forest, or native undisturbed prairie, that connects to estuaries, other wetlands, or undisturbed uplands that are at least 250 acres in size? (*Dams in riparian corridors, heavily used gravel roads, and paved roads are considered breaks in the corridor.*) YES = **4 points** (*go to H 2.3*) NO = *go to H 2.2.2*	
H 2.2.2	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (either riparian or upland) at least 50 feet wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands, or undisturbed uplands that are at least 25 acres in size **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? YES = **2 points** (*go to H 2.3*) NO = *go to H 2.2.3*	
H 2.2.3	Is the wetland: ☐ within 5 miles (8 km) of a brackish or salt water estuary **OR** ☐ within 3 miles of a large field or pasture > 40 acres in size **OR** ☐ within 1 mile of a lake greater than 20 acres in size? YES = **1 point** NO = **0 points**	

Total for page 1

H 2.3	Near or Adjacent to Other Priority Habitats Listed by WDFW ***(see p. 82)***	**Points**

Which of the following priority habitats are within 330 feet (100 m) of the wetland unit?
NOTE: the connections do not have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions

- ☐ **Aspen stands:** Pure or mixed stands of aspen >0.4 ha (1 acre).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over
- ☐ **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 20 trees/ha (8/acre) >81 cm (32 in) dbh or > 200 years of age. (Mature forests) S
- ☐ **Oregon white Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is 25% (*full descrptions in WDFW PHS report p. 158*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each
- ☐ **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*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life hsitory requirements for instream
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coastal Nearshore, and Puget Sound Nearshore. (*full descriptions*
- ☐ **Caves**: 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 7.6 m (25 ft) high and occuring below 5,000 ft.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

4

If wetland has: **3+** priority habitats = **4 points** **1** priority habitat = **1 point**
2 priority habitats = **3 points** No habitats = **0 points**

Note: all vegetated wetlands are by definition a priority habitat but are not included in this list.

Nearby wetlands are addressed in question H 2.4	
Choose the **one** description of the landscape around the wetland that best fits. ☐ There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development). **Points = 5** ☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 5** ☑ There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. **Points = 3** ☐ The wetland is Lake-fringe on a lake **with** disturbance, and there are 3 other Lake-fringe wetlands within 1/2 mile. **Points = 3** ☐ There is at least 1 wetland within 1/2 mile. **Points = 2** ☐ There are no wetlands within 1/2 mile. **Points = 0**	3
H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	8
Total Score for Habitat Functions - add the points for H1 and H2, and record the result on p. 1	19

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and choose the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Check the appropriate Category when the appropriate criteria are met.*	**Category**
SC 1.0 **<u>Estuarine Wetlands</u>** ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = *Go to SC 1.1* ☐ NO - not an estuarine wetland	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = **Category I** ☐ NO = *Go to SC 1.2*	
SC 1.2 Is the wetland unit at least 1 acre in size and meeting at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has <10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover >10% of the wetland, then the wetland should be given a dual rating (I/II). The area of *Spartina* would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of *Spartina* in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or continguous freshwater wetlands. ☐ YES = **Category I** ☐ NO - not an estuarine wetland	

		Category
SC 2.0	**<u>Natural Heritage Wetlands</u>** ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ ☐ YES - contact WNHP/DNR *(see p. 79)* and *go to SC 3.2* ☐ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state Threatened or Endangered plant species? ☐ YES = **Category I** ☐ NO - not a Heritage wetland	
SC 3.0	**<u>Bogs</u>** ***(see p. 87)*** Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetations in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer Yes, you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic oils.) ☐ YES - *go to Q. 3* ☐ NO - *go to Q. 2* 2. Does the unit have organic soils, either peats or mucks, that are <16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES - *go to Q. 3* ☐ NO - not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (>30% of total shrub and herbaceous cover consists of species in Table 3)? ☐ YES - is a bog for purpose of rating ☐ NO - *go to Q. 4* NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (>30% cover) with sitka spruce, subalpine fir, western redcedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of total shrub/herbaceous cover*)? ☐ YES = **Category I** ☐ NO - not a bog for purpose of rating	

		Category
SC 4.0	**Forested Wetlands** ***(see p. 90)***	

Does the wetland unit have at least 1 acre of forest that meets one of these criteria for the Department of Fish and Wildlife's forests as priority habitat? *If you answer Yes, you will still need to rate the wetland based on its functions.*

☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more.

NOTE: The criterion for dbh is based on measurements for upland forests. 200-year-old trees in wetlands will often have a smaller dbh because their growth rates are often smaller. The DFW criterion is an "OR" so old-growth forests do not necessarily have to have trees of this diameter.

☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 - 200 years old OR have average diameters (dbh) exceeding 21 inches (53 cm); 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.

☐ YES = **Category I** ☐ NO - not a forested wetland w/ special characteristics

SC 5.0 **Wetlands in Coastal Lagoons** ***(see p. 91)***

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

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks.

☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (>.5 ppt) during most of the year in at leat a portion of the lagoon (*needs to be measured near the bottom*).

☐ YES = *go to SC 5.1* ☐ NO - not a wetland in a coastal lagoon

SC 5.1 Does the wetland meet all of the following 3 conditions?

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).

☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland.

☐ The wetland is larger than 1/10 acre (4,350 square feet).

☐ YES = **Category I** ☐ NO - not a wetland in a coastal lagoon

SC 6.0 **Interdunal Wetlands *(see p. 93)***	**Category**
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - *go to SC 6.1* ☐ NO - not an interdunal wetland for rating ***If you answer Yes, you will still need to rate the wetland based on its functions.*** In practical terms, that means the following geographic areas: • Long Beach Peninsula - lands west of SR 103 • Grayland-Westport - lands west of SR 105 • Ocean Shores-Copalis - lands west of SR 1115 and SR 109. SC 6.1 Is wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? ☐ YES = **Category II** ☐ NO - *go to SC 6.2* SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = **Category III**	
Category of wetland based on Special Characteristics Choose the "highest" rating if wetland falls into several categories, and record on p. 1. If you answered NO for all types, enter "Not Applicable" on p. 1.	

Wetland name or number WTU-3

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WTU-3 Date of site visit: Nov-19

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

HGM Class used for rating Slope 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 IV (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	L	L	M	
Landscape Potential	L	L	L	
Value	H	M	H	**Total**
Score Based on Ratings	5	4	6	**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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number WTU-3

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	11
Hydroperiods	H 1.2	12
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	13
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	13
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	11
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)	S 3.1, S 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	6

HGM Classification of Wetland in Western Washington

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

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

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

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

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

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

3. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
- ☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

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

4. Does the entire wetland unit **meet all** of the following criteria?
- ☑ The wetland is on a slope (*slope can be very gradual*),
- ☑ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
- ☑ The water leaves the wetland **without being impounded.**

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

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

5. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
- ☐ The overbank flooding occurs at least once every 2 years.

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

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

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

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

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

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

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

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

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

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

Wetland name or number WTU-3

SLOPE WETLANDS

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

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: (*a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less — points = 3 Slope is > 1% - 2% — points = 2 Slope is > 2% - 5% — points = 1 Slope is greater than 5% — points = 0	0
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (*use NRCS definitions*): Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	2
Total for S 1 — Add the points in the boxes above	**2**

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

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other Sources Yes = 1 No = 0	0
Total for S 2 — Add the points in the boxes above	**0**

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

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

Wetland name or number WTU-3

SLOPE WETLANDS

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

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland — points = 1 All other conditions — points = 0	0

Rating of Site Potential If score is: ☐ **1 = M** ☑ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	0

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

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) — points = 2 Surface flooding problems are in a sub-basin farther down-gradient — points = 1 No flooding problems anywhere downstream — points = 0	1
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 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*

NOTES and FIELD OBSERVATIONS:

Wetland name or number WTU-3

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	2
☑ 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

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	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**	

H 1.3. Richness of plant species

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

1

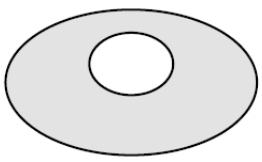
If you counted:	> 19 species	points = 2
	5 - 19 species	points = 1
	< 5 species	points = 0

H 1.4. Interspersion of habitats

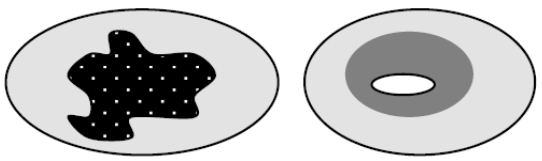
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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

3

None = 0 points

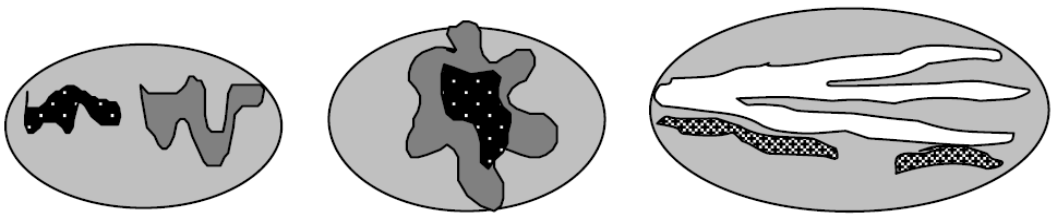


Low = 1 point



Moderate = 2 points

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



Wetland name or number WTU-3

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* ☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☑ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	2
Total for H 1 Add the points in the boxes above	**11**

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

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 5 % undisturbed habitat + (1 % moderate & low intensity land uses / 2) = 5.5% 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. *Calculate:* 10 % undisturbed habitat + (10 % moderate & low intensity land uses / 2) = 15% 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: ☐ **4 - 6 = H** ☐ **1 - 3 = M** ☑ **< 1 = L** *Record the rating on the first page*

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

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

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

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

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☑ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☑ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☑ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name or number WTU-3

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☐ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☐ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☐ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☐ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☐ No = **Is not a bog**	

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

SC 5.0. Wetlands in Coastal Lagoons

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

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

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

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

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

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

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

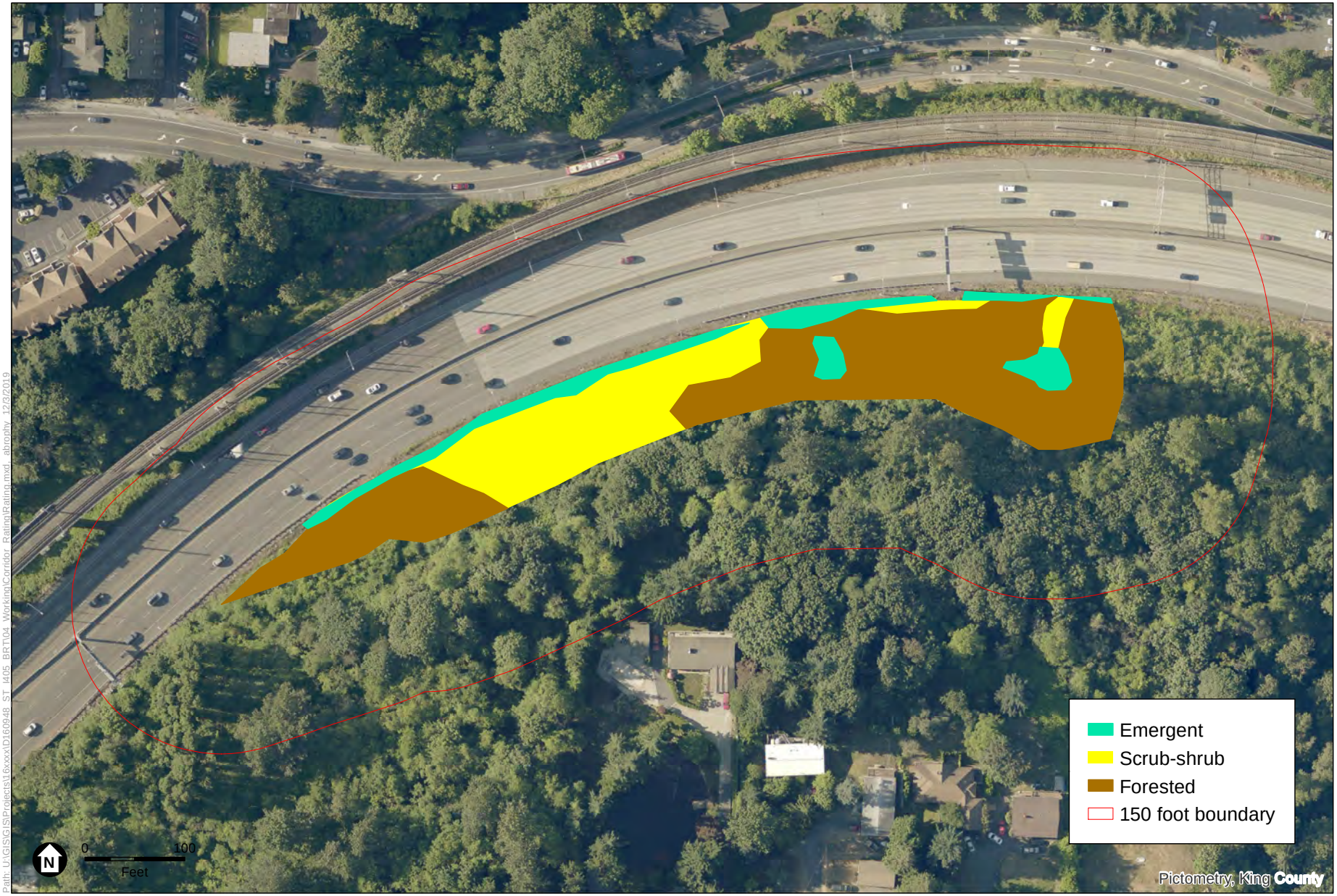
☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

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

Category of wetland based on Special Characteristics

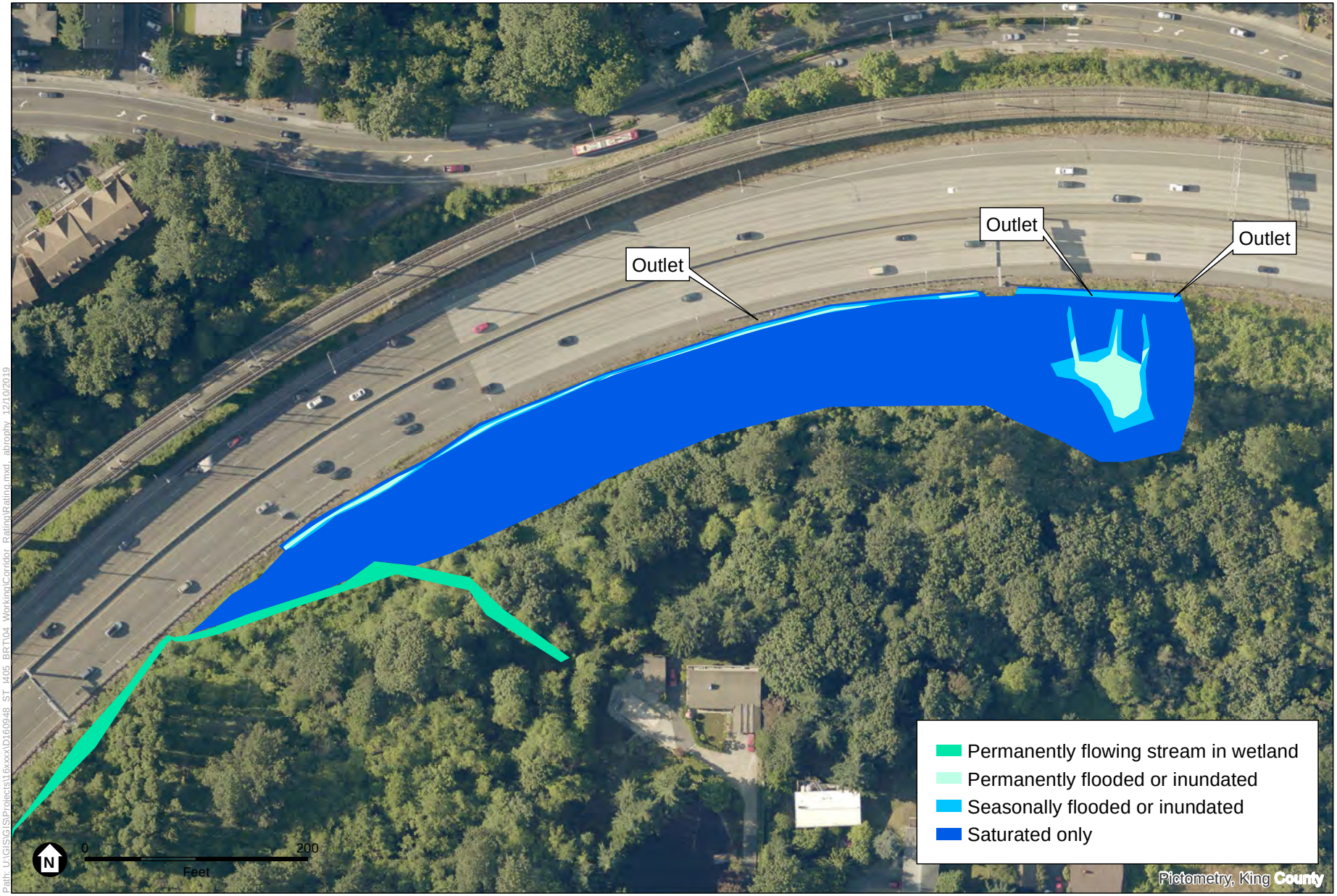
If you answered No for all types, enter "Not Applicable" on Summary Form



I-405 BRT Wetland and Stream Investigation

Figure 11
Wetland WTU-3 - Cowardin plant classes and boundary of area within 150 feet of the wetland
Tukwila, Washington

ESA



I-405 BRT Wetland and Stream Investigation

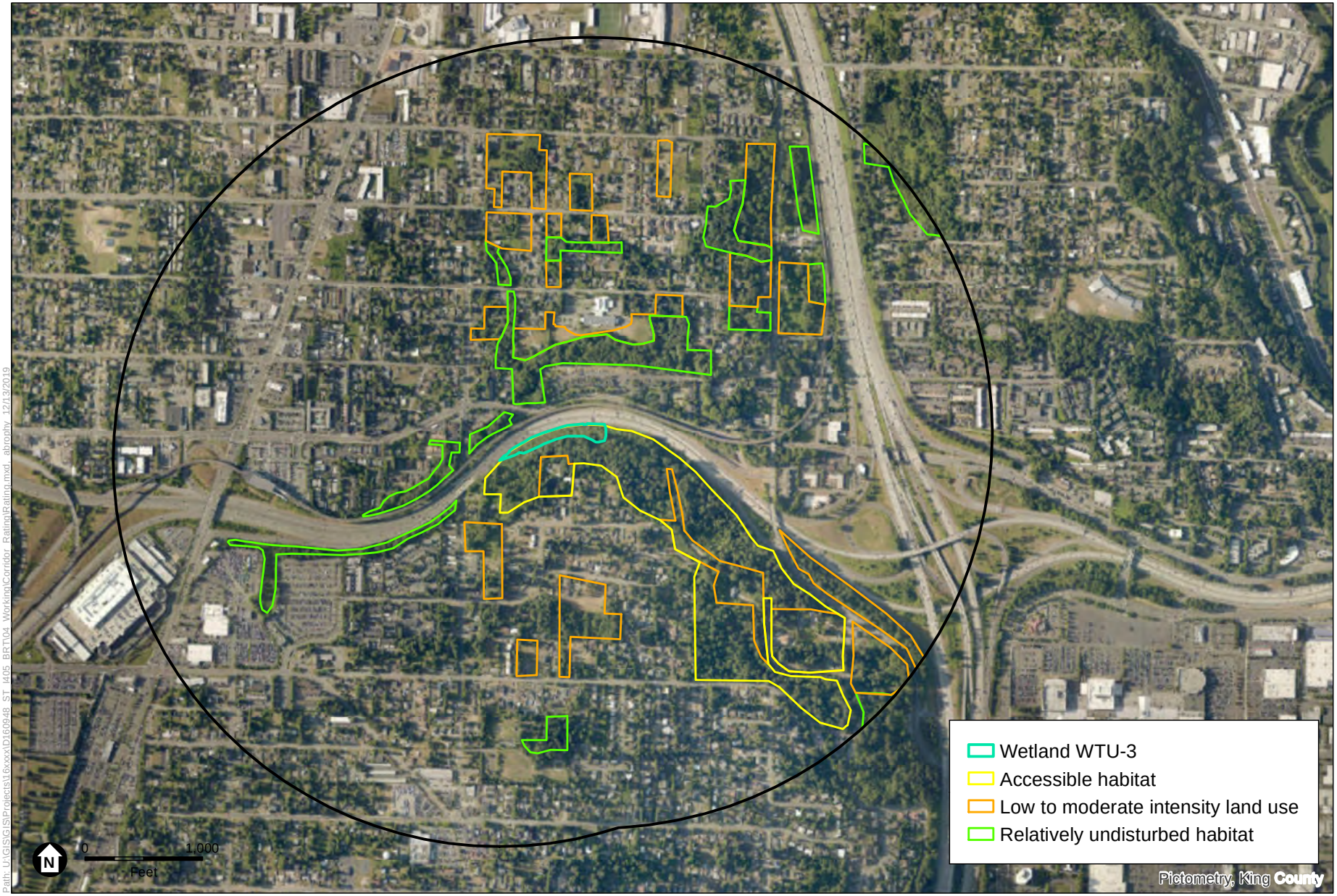
Figure 12
Wetland WTU-3 - hydroperiods and locaiton of outlet
Tukwila, Washington

ESA

I-405 BRT Wetland and Stream Investigation

Figure 13
Wetland WTU-3 - plant cover of dense herbaceous and woody plants
Tukwila, Washington

ESA



I-405 BRT Wetland and Stream Investigation

Figure 14
Wetland WTU-3 - accessible and undisturbed habitat within 1 km from the wetland edge
Tukwila, Washington

ESA

Wetland name or number: WTU-4

WETLAND RATING FORM - WESTERN WASHINGTON

Version 2 - Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): WTU-4 Date of site visit: 11/22/19

Rated by A. Brophy & C.Hersum Trained by Ecology? Yes ☑ No ☐ Date: 10/11/18

SEC: 23 TWNSHP: 23N RNGE: 04E Is S/T/R in Appendix D? Yes ☐ No ☑

Map of wetland unit: Figure _____ **Estimated size:** _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland:

I ☐ **II** ☐ **III** ☐ **IV** ☑

Category I = Score >=70	
Category II = Score 51-69	
Category III = Score 30-50	
Category IV = Score <30	

Score for Water Quality Functions	8
Score for Hydrologic Functions	6
Score for Habitat Functions	8
TOTAL score for functions	**22**

Category based on SPECIAL CHARACTERISTICS of wetland

I ☐ **II** ☐ **Does not Apply** ☑

Final Category **(choose the "highest" category from above)** **IV**

Check the appropriate type and class of wetland being rated.

Wetland Type	
Estuarine	☐
Natural Heritage Wetland	☐
Bog	☐
Mature Forest	☐
Old Growth Forest	☐
Coastal Lagoon	☐
Interdunal	☐
None of the above	☑

Wetland Class	
Depressional	☑
Riverine	☐
Lake-fringe	☐
Slope	☐
Flats	☐
Freshwater Tidal	☐
Check if unit has multiple HGM classes present	☐

Comments:

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below, you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands That May Need Special Protection (in addition to the protection recommended for its category)		YES	NO
SP1.	*Has the wetland unit been documented as a habitat for any federally listed Threatened or Endangered* ***animal or plant*** *species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☑
SP2.	*Has the wetland unit been documented as habitat for any state listed Threatened or Endangered* ***animal*** *species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).	☐	☑
SP3.	*Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☑
SP4.	*Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☑

To complete the next part of the data sheet, you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Classification of Vegetated Wetlands in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, indentify 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 (i.e., except during floods)?

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

If YES, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

☐ YES - **Freshwater Tidal Fringe** ☐ NO - **Saltwater Tidal Fringe (Estuarine)**

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 rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Saltwater Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is being kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. xx).

2. The entire wetland unit is flat and precipitation is 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 both** of the following criteria?

☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

☐ At least 30% of the open water area is deeper than 6.6 feet (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.**

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 feet in diameter and less than 1 foot deep).*

☑ NO - go to 5 ☐ YES - the wetland class is **Slope**

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 once every two years.

☑ NO - go to 6 ☐ YES - the wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 ground water 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 within your wetland. 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 being rated. If the area of the second class is less than 10% of the unit, classify the wetland using the class that represent more than 90% of the total area.

HGM Classes Within a Delineated Wetland Boundary	***Class to Use in Rating***	
Slope + Riverine	Riverine	☐
Slope + Depressional	Depressional	☐
Slope + Lake-fringe	Lake-fringe	☐
Depressional + Riverine along stream within boundary	Depressional	☐
Depressional + Lake-fringe	Depressional	☐
Saltwater Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics	☐

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

D Depressional and Flats Wetlands

WATER QUALITY FUNCTIONS - Indicators that wetland functions to improve water quality.

		Points
D 1.	**Does the wetland unit have the <u>potential</u> to improve water quality? *(see p. 38)***	**Points**
D 1.1	Characteristics of surface water flows out of the wetland: ☐ Unit is a depression with no surface water leaving it (no outlet) **Points = 3** ☐ Unit has an intermittently flowing, or highly constricted permanently flowing outlet. **Points = 2** ☑ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*). **Points = 1** ☐ Unit is a flat depression (Q. 7 on key) or in the Flats class, with permenent surface outflow and **no obvious natural outlet** and/or outlet is a man-made ditch. (If ditch is not permanently flowing, treat unit as "intermittently flowing.") **Points = 1** Provide photo or drawing	1 **Figure 16**
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions): ☐ YES **Points = 4** ☑ NO **Points = 0**	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): ☐ Wetland has persistent, ungrazed vegetation >=95% of area. **Points = 5** ☐ Wetland has persistent, ungrazed vegetation >=1/2 of area. **Points = 3** ☑ Wetland has persistent, ungrazed vegetation >=1/10 of area. **Points = 1** ☐ Wetland has persistent, ungrazed vegetation <1/10 of area **Points = 0** Map of Cowardin vegetation classes	1 **Figure 15**
D 1.4	Characteristics of seasonal ponding or inundation. *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* ☐ Area seasonally ponded is >1/2 total area of wetland. **Points = 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** Map of hydroperiods	2 **Figure 16**
	Total for D 1 *Add the points in the boxes above*	4

D 2.	**Does the wetland unit have the <u>opportunity</u> to improve water quality? *(see p. 44)*** Answer YES if you know or believe there are pollutants in ground water or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes, or ground water downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants:* ☐ Grazing in the wetland or within 150 feet. ☐ Untreated stormwater discharges to wetland. ☐ Tilled fields or orchards within 150 feet of wetland. ☐ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging. ☑ Residential, urban areas, golf courses are within 150 feet of wetland. ☐ Wetland is fed by ground water high in phosphorus or nitrogen. ☐ Other: _____ YES - multiplier is **2** NO - multiplier is **1**	Multiplier 2
TOTAL - Water Quality Functions	Multiply the score from D 1. by D 2. ***Add score to table on p. 1***	8

D Depressional and Flats Wetlands

HYDROLOGIC FUNCTIONS - Indicators that wetland functions to reduce flooding/stream degradation.

D 3. Does wetland unit have the potential to reduce flooding/erosion? *(see p. 46)*		**Points**
D 3.1 Characteristics of surface water flows out of the wetland:		
☐ Unit is a depression with no surface water leaving it (no outlet).	**Points = 4**	0
☐ Unit has an intermittently flowing, **OR** highly constricted permanently flowing outlet.	**Points = 2**	
☐ Unit is a "flat" depression (Q. 7 on key), or in the Flats class, with permanent surface outflow and **no obvious natural outlet** and/or outlet is a man-made ditch. (*If ditch is not permanently flowing, treat unit at "intermittently flowing."*)	**Points = 1**	
☑ Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*).	**Points = 0**	
D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).*		0
☐ Marks of ponding are 3 feet or more above the surface or bottom of outlet.	**Points = 7**	
☐ The wetland is a "headwater" wetland.	**Points = 5**	
☐ Marks of ponding between 2 feet to <3 feet from surface or bottom of outlet.	**Points = 5**	
☐ Marks are at least 0.5 feet to <2 feet from surface or bottom of outlet.	**Points = 3**	
☐ Wetland is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water.	**Points = 1**	
☑ Marks of ponding are less than 0.5 feet.	**Points = 0**	
D 3.3 Contribution of 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 itself.*		3
☐ The area of the basin is <10 times the area of the unit.	**Points = 5**	
☑ The area of the basin is 10 to 100 times the area of the unit.	**Points = 3**	
☐ The area of the basin is >100 times the area of the unit.	**Points = 0**	
☐ Entire unit is in the **Flats** class (basin=wetland)	**Points = 5**	
Total for D 3	*Add the points in the boxes above*	3

D 4. Does wetland unit have the opportunity to reduce flooding/erosion? *(see p. 49)*		
Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows.		
Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir, etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur.		
Note which of the following indicators of opportunity apply:		
☐ Wetland is in a headwater of a river or stream that has flooding problems.		
☑ Wetland drains to a river or stream that has flooding problems.		
☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems.		Multiplier
☐ Other:		2
YES - multiplier is **2**	NO - multiplier is **1**	
TOTAL - Hydrologic Functions	Multiply the score from D 3. by D 4. ***Add score to table on p. 1***	6

These questions apply to wetlands of all HGM classes

HABITAT FUNCTIONS - Indicators that wetland functions to provide important habitat.

H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species? — **Points**

H 1.1 <u>Vegetation structure</u> ***(see p. 72)***

Check the types of vegetation classes present (as defined by Cowardin). Size threshold for class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.

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

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

Add the number of vegetation types that qualify. If you have:

4 structures or more	**Points = 4**
3 structures	**Points = 2**
2 structures	**Points = 1**
1 structure	**Points = 0**

Map of Cowardin classes — **Figure 15**

Points: 0

H 1.2 <u>Hydroperiods</u> ***(see p. 73)***

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland if less than 2.5 acres in size or 1/4 acre to count (see text for descriptions of hydroperiods).

☑ Permanently flooded or inundated	4 or more types present	**Points = 3**
☑ Seasonally flooded or inundated	3 types present	**Points = 2**
☐ Occasionally flooded or inundated	2 types present	**Points = 1**
☑ Saturated only	1 type present	**Points = 0**

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

Map of hydroperiods — **Figure 16**

Points: 2

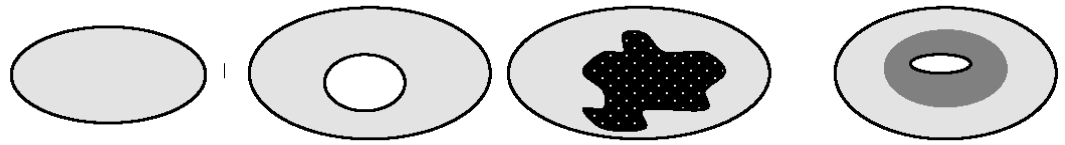
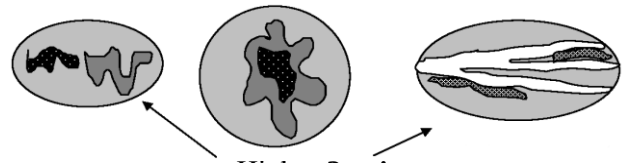
H 1.3 <u>Richness of Plant Species</u> ***(see p. 75)***

Count the number of plant species in the wetland that cover at least 10 sq. ft. (different patches of the same species can be combined to meet the size threshold). 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**
List species below if you want to:	<5 species	**Points = 0**

Points: 1

Total for page: 3

		Points
H 1.4	Interspersion of Habitats ***(see p. 76)*** *Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1) or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.*  None = **0 points** Low = **1 point** Moderate = **2 points**  [riparian braided channels] High = **3 points** NOTE: If you have four or more vegetation types or three vegetation types and open water, the rating is always "high". **Use map of Cowardin vegetation classes.**	0
H 1.5	Special Habitat Features ***(see p. 77)*** *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (>4 inches in diameter and 6 feet long). ☐ Standing snags (diameter at the bottom >4 inches) in the wetland. ☐ Undercut banks are present for at least 6.6 feet (2 m) and/or overhanging vegetation extends at least 3.3 feet (1 m) over a stream (or ditch) in or contiguous with the wetland, for at least 33 feet (10 m). ☐ Stable steep banks of fine material that might be used by beaver/muskrat for denning (>30° slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet turned brown/gray*). ☐ At least 1/4 acre of thin-stemmed presistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*). ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants. *Note: The 20% stated in early printings of the manual on page 78 is an error.*	0
	H 1. TOTAL Score - potential for providing habitat *Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*	3
Comments:		

H 2.	**Does the wetland unit have the opportunity to provide habitat for many species?**	**Points**
H 2.1	Buffers ***(see p. 80)***	
	Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within undisturbed part of buffer (*relatively undisturbed also means no grazing, no landscaping, no daily human use*). **Points = 5**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >50% of circumference. **Points = 4**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**	
	☐ 100 m (330 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >25% circumference. **Points = 3**	
	☐ 50 m (170 feet) of relatively undisturbed vegetated areas, rocky areas, or open water for >50% circumference. **Points = 3**	2
	If buffer does not meet any of the criteria above:	
	☐ No paved areas (except paved trails) or buildings within 25 m (80 feet) of wetland >95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☑ No paved areas or buildings within 50 m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**	
	☐ Heavy grazing in buffer. **Points = 1**	
	☐ Vegetated buffers are <2 m wide (6.6 feet) for more than 95% of the circumference (e.g., tilled fields, paving, basalt bedrock extend to edge of wetland). **Points = 0**	
	☐ Buffer does not meet any of the criteria above. **Points = 1**	
	Aerial photo showing buffers **Figure 18**	
H 2.2	Corridors and Connections ***(see p. 81)***	0
H 2.2.1	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (riparian or upland) at least 150 feet wide, has at least 30% cover of shrubs, forest, or native undisturbed prairie, that connects to estuaries, other wetlands, or undisturbed uplands that are at least 250 acres in size? (*Dams in riparian corridors, heavily used gravel roads, and paved roads are considered breaks in the corridor.*)	
	YES = **4 points** (*go to H 2.3*) NO = *go to H 2.2.2*	
H 2.2.2	Is the wetland part of a relatively undisturbed/unbroken vegetated corridor (either riparian or upland) at least 50 feet wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands, or undisturbed uplands that are at least 25 acres in size **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above?	
	YES = **2 points** (*go to H 2.3*) NO = *go to H 2.2.3*	
H 2.2.3	Is the wetland: ☐ within 5 miles (8 km) of a brackish or salt water estuary **OR** ☐ within 3 miles of a large field or pasture > 40 acres in size **OR** ☐ within 1 mile of a lake greater than 20 acres in size? YES = **1 point** NO = **0 points**	

Total for page 2

H 2.3	Near or Adjacent to Other Priority Habitats Listed by WDFW ***(see p. 82)***	**Points**

Which of the following priority habitats are within 330 feet (100 m) of the wetland unit?
NOTE: the connections do not have to be relatively undisturbed. These are DFW definitions. Check with your local DFW biologist if there are any questions

- ☐ **Aspen stands:** Pure or mixed stands of aspen >0.4 ha (1 acre).
- ☐ **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 p. 152*).
- ☐ **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 20 trees/ha (8/acre) >81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; decay, decadance, 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 25% (*full descrptions in WDFW PHS report p. 158*).
- ☐ **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*).
- ☐ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life hsitory requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coastal Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report pp. 167-169 and glossary in Appendix A).*
- ☐ **Caves**: 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 7.6 m (25 ft) high and occuring below 5,000 ft.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), 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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

0

If wetland has: **3+** priority habitats = **4 points** **1** priority habitat = **1 point**
2 priority habitats = **3 points** No habitats = **0 points**

Note: all vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4

H 2.4	Wetland Landscape ***(see p. 84)***		**Points**
	*Choose the **one** description of the landscape around the wetland that best fits.*		
	☐ There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development).	**Points = 5**	
	☐ The wetland is Lake-fringe on a lake with little disturbance and there are 3 other Lake-fringe wetlands within 1/2 mile.	**Points = 5**	3
	☑ There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed.	**Points = 3**	
	☐ The wetland is Lake-fringe on a lake **with** disturbance, and there are 3 other Lake-fringe wetlands within 1/2 mile.	**Points = 3**	
	☐ There is at least 1 wetland within 1/2 mile.	**Points = 2**	
	☐ There are no wetlands within 1/2 mile.	**Points = 0**	
	H 2. TOTAL Score - opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*		5
Total Score for Habitat Functions - add the points for H1 and H2, and record the result on p. 1			8

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and choose the appropriate answers and Category.

Wetland Type *Check off any criteria that apply to the wetland. Check the appropriate Category when the appropriate criteria are met.*	**Category**
SC 1.0 **<u>Estuarine Wetlands</u>** ***(see p. 86)*** Does the wetland unit meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt. ☐ YES = *Go to SC 1.1* ☐ NO - not an estuarine wetland	
SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park, or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = **Category I** ☐ NO = *Go to SC 1.2*	
SC 1.2 Is the wetland unit at least 1 acre in size and meeting at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has <10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover >10% of the wetland, then the wetland should be given a dual rating (I/II). The area of *Spartina* would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of *Spartina* in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or continguous freshwater wetlands. ☐ YES = **Category I** ☐ NO = **Category II**	

		Category
SC 2.0	**<u>Natural Heritage Wetlands</u>** ***(see p. 87)*** Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D ☐ or accessed from WNHP/DNR web site ☐ ☐ YES - contact WNHP/DNR *(see p. 79)* and *go to SC 3.2* ☐ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state Threatened or Endangered plant species? ☐ YES = **Category I** ☐ NO - not a Heritage wetland	
SC 3.0	**<u>Bogs</u>** ***(see p. 87)*** Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below to identify if the wetland is a bog.* ***If you answer Yes, you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic oils.) ☐ YES - *go to Q. 3* ☐ NO - *go to Q. 2* 2. Does the unit have organic soils, either peats or mucks, that are <16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES - *go to Q. 3* ☐ NO - not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (>30% of total shrub and herbaceous cover consists of species in Table 3)? ☐ YES - is a bog for purpose of rating ☐ NO - *go to Q. 4* NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (>30% cover) with sitka spruce, subalpine fir, western redcedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on bog species plant list in Table 3 as a significant component of the ground cover (*>30% coverage of total shrub/herbaceous cover*)? ☐ YES - **Category I** ☐ NO - not a bog for purpose of rating	

		Category
SC 4.0	**<u>Forested Wetlands</u>** ***(see p. 90)*** Does the wetland unit have at least 1 acre of forest that meets one of these criteria for the Department of Fish and Wildlife's forests as priority habitat? *If you answer Yes, you will still need to rate the wetland based on its functions.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more. NOTE: The criterion for dbh is based on measurements for upland forests. 200-year-old trees in wetlands will often have a smaller dbh because their growth rates are often smaller. The DFW criterion is an "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 - 200 years old OR have average diameters (dbh) exceeding 21 inches (53 cm); 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. ☐ YES = **Category I** ☐ NO - not a forested wetland w/ special characteristics	
SC 5.0	**<u>Wetlands in Coastal Lagoons</u>** ***(see p. 91)*** Does the wetland meet all of the following criteria of a wtland in a coastal lagoon? ☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks. ☐ The lagoon in which the wetland is located contains surface water that is saline or brackish (>.5 ppt) during most of the year in at leat a portion of the lagoon (*needs to be measured near the bottom*). ☐ YES = *go to SC 5.1* ☐ NO - not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following 3 conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 of the landward edge of the wetland has a 100 foot buffer of shrub, forest, or ungrazed or unmowed grassland. ☐ The wetland is larger than 1/10 acre (4,350 square feet). ☐ YES = **Category I** ☐ NO = **Category II**	

SC 6.0 **Interdunal Wetlands** ***(see p. 93)***	Category
Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES - *go to SC 6.1* ☐ NO - not an interdunal wetland for rating ***If you answer YES, you will still need to rate the wetland based on its functions.*** In practical terms, that means the following geographic areas: • Long Beach Peninsula - lands west of SR 103 • Grayland-Westport - lands west of SR 105 • Ocean Shores-Copalis - lands west of SR 1115 and SR 109. SC 6.1 Is wetland 1 acre or larger, or is it in a mosaic of wetlands that is 1 acre or larger? ☐ YES = **Category II** ☐ NO - *go to SC 6.2* SC 6.2 Is the wetland unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = **Category III**	
Category of wetland based on Special Characteristics Choose the "highest" rating if wetland falls into several categories, and record on p. 1. If you answered NO for all types, enter "Not Applicable" on p. 1.	

RATING SUMMARY – Western Washington

Name of wetland (or ID #): WTU-4 Date of site visit: 11/22/2019

Rated by A. Brophy Trained by Ecology? ☑ Yes ☐ No Date of training 10/11/2018

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 IV (based on functions ☑ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			List appropriate rating (H, M, L)	
Site Potential	L	L	L	
Landscape Potential	M	H	L	
Value	H	M	L	**Total**
Score Based on Ratings	6	6	3	**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

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

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to another figure*)	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	

HGM Classification of Wetland in Western Washington

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

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

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

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

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

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

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

3. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
- ☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

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

4. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The wetland is on a slope (*slope can be very gradual*),
- ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
- ☐ The water leaves the wetland **without being impounded.**

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

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

5. Does the entire wetland unit **meet all** of the following criteria?
- ☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
- ☐ The overbank flooding occurs at least once every 2 years.

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:

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 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 ☑ Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 ☐ Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	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 Wetland has persistent, ungrazed, plants > ½ 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	1
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	2
Total for D 1 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 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	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source Yes = 1 No = 0	0
Total for D 2 Add the points in the boxes above	**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*)? Yes = 2 No = 0	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. Characteristics of surface water outflows from the wetland:		
Wetland is a depression or flat depression with no surface water leaving it (no outlet)	points = 4	0
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. 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.*		0
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
☐ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
☐ The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*		3
☐ The area of the basin is less than 10 times the area of the unit	points = 5	
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
☐ Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	**3**

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.*		1
The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds):		
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2	
☑ • Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
☐ Flooding from groundwater is an issue in the sub-basin.	points = 1	
☐ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why	points = 0	
☐ There are no problems with flooding downstream of the wetland.	points = 0	
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	0
☑ 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

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	2
☑ 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**	

H 1.3. Richness of plant species

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

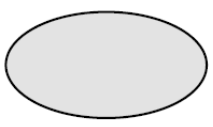
1

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

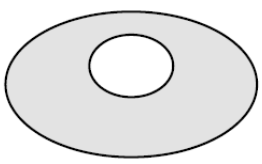
H 1.4. Interspersion of habitats

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. *If you have four or more plant classes or three classes and open water, the rating is always high.*

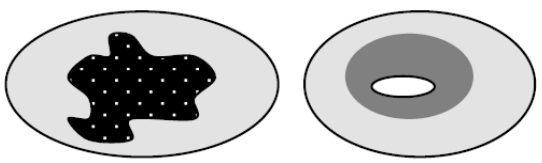
0



None = 0 points

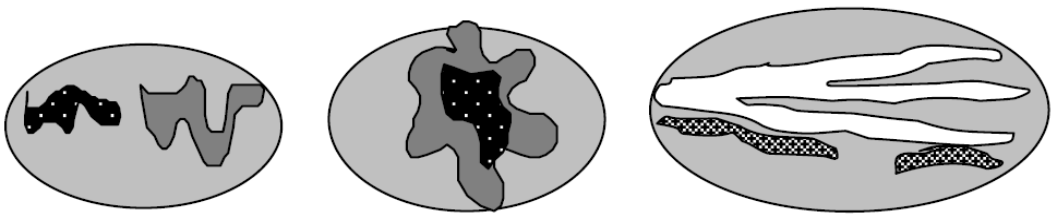


Low = 1 point



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. *The number of checks is the number of points.* ☐ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long) ☐ Standing snags (dbh > 4 in) within the wetland ☐ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*) ☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*) ☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	0
Total for H 1 Add the points in the boxes above	**3**

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

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 5 % undisturbed habitat + (2 % moderate & low intensity land uses / 2) = 6% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 5 % undisturbed habitat + (10 % moderate & low intensity land uses / 2) = 10% 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: ☐ **4 - 6 = H** ☐ **1 - 3 = M** ☑ **< 1 = L** *Record the rating on the first page*

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

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

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp.
http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here:
http://wdfw.wa.gov/conservation/phs/list/

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

- ☐ **Aspen Stands**: Pure or mixed stands of aspen greater than 1 ac (0.4 ha).
- ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).
- ☐ **Herbaceous Balds**: Variable size patches of grass and forbs on shallow soils over bedrock.
- ☐ **Old-growth/Mature forests**: Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.
- ☐ **Oregon White Oak**: Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).
- ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- ☐ **Westside Prairies**: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).
- ☐ **Instream**: The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.
- ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).
- ☐ **Caves**: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.
- ☐ **Cliffs**: Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.
- ☐ **Talus**: Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.
- ☐ **Snags and Logs**: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. List the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine Wetlands Does the wetland meet the following criteria for Estuarine wetlands? ☐ The dominant water regime is tidal, ☐ Vegetated, and ☐ With a salinity greater than 0.5 ppt ☐ Yes - Go to **SC 1.1** ☐ No = **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ Yes = **Category I** ☐ No - Go to **SC 1.2**	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina* , see page 25) ☐ At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. ☐ The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. ☐ Yes = **Category I** ☐ No = **Category II**	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? ☐ Yes - Go to **SC 2.2** ☐ No - Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? ☐ Yes = **Category I** ☐ No = **Not WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf ☐ Yes - **Contact WNHP/WDNR and to SC 2.4** ☐ No = **Not WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? ☐ Yes = **Category I** ☐ No = **Not WHCV**	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions*** . SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? ☐ Yes - Go to **SC 3.3** ☐ No - Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? ☐ Yes - Go to **SC 3.3** ☐ No = **Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? ☐ Yes = **Is a Category I bog** ☐ No - Go to **SC 3.4** **NOTE**: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? ☐ Yes = **Is a Category I bog** ☐ No = **Is not a bog**	

SC 4.0. Forested Wetlands

Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***

☐ **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.

☐ **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80-200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

SC 5.0. Wetlands in Coastal Lagoons

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

☐ The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks

☐ The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

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

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

☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?

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

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

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

SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?

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

Category of wetland based on Special Characteristics

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

I-405 BRT Wetland and Stream Investigation

Figure 15
Wetland WTU-4 - Cowardin plant classes and boundary of area within 150 feet of the wetland
Tukwila, Washington

ESA

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I-405 BRT Wetland and Stream Investigation

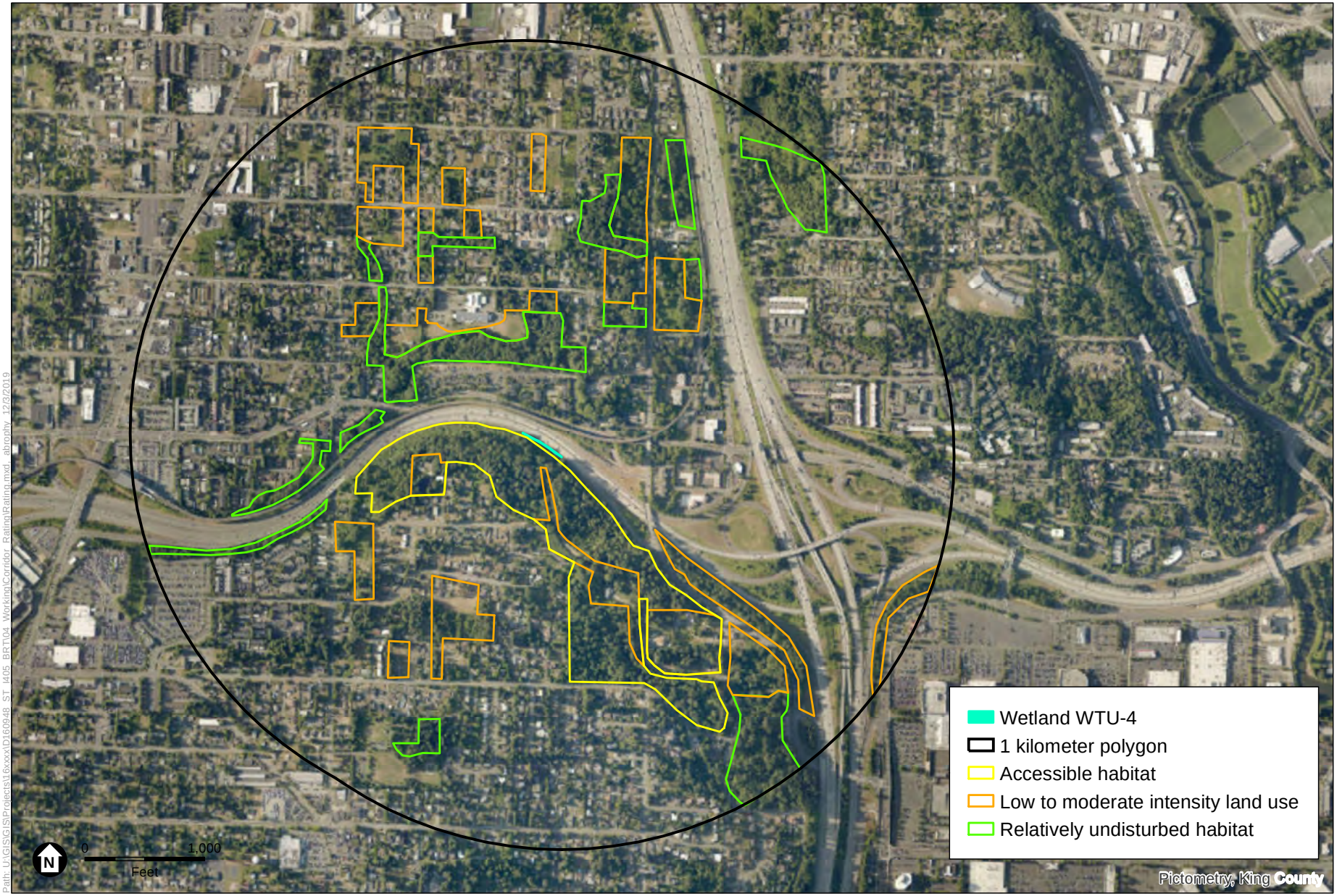
Figure 16
Wetland WTU-4 - hydroperiods and location of outlet
Tukwila, Washington

ESA

I-405 BRT Wetland and Stream Investigation

Figure 17
Wetland WTU-4 - contributing basin
Tukwila, Washington

ESA



I-405 BRT Wetland and Stream Investigation

Figure 18
Wetland WTU-4 - accessible and undisturbed habitat in area that extends 1 km from the wetland edge
Tukwila, Washington

ESA

APPENDIX F

WSDOT Function Characterization Form

Wetland Functions & Values Form

Wetland I.D. WTU-1 Project: ST I-405 BRT Project Assessed by: A. Brophy

Cowardin Class: P Ecology Category: III Local Rating: III Wetland size: 0.02 acre Date: 12/11/2019

Function/Value	Occurrence Y	Occurrence N	Rationale	Principal Function(s)	Comments
Flood Flow Alteration		X	Wetland is a slope.	N	
Sediment Removal		X	Wetland is a slope.	N	
Nutrient & Toxicant Removal		X	Wetland is a slope.	N	
Erosion Control & Shoreline Stabilization		X	Wetland is a slope.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent vegetation and is seasonally inundated during the growing season.	N	Low function –Species diversity is moderate but it has a slightly constricted outlet to export nutrients.
General Habitat Suitability		X	Wetland has one Cowardin class.	N	
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 stream and emergent in 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. Wetland associated with stream and receives flood waters. Wetland contains still and moving water.	N	Low function – Emergent vegetation in ponded areas, but most not conducive to support amphibian egg masses. Buffer partially disturbed but forested upland present. No amphibians were observed.
Habitat for Wetland-Associated Mammals	X		Wetland is associated with permanently flowing stream and seasonally ponded habitat.	N	Low function – Low interspersion of water and no interspersion of vegetation is present in wetland. Trees and shrubs present in buffer but not in wetland.
Habitat for Wetland-Associated Birds		X	Wetland does not have shallow open water habitat.	N	

General Fish Habitat		X	Wetland is a slope.	N	
Native Plant Richness		X	Wetland contains one Cowardin class.	N	
Educational or Scientific Value		X	Majority of the 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. WTU-2 Project: ST I-405 BRT Project Assessed by: A. Brophy

Cowardin Class: PEM/PSS/PFO Ecology Category: III Local Rating: III Wetland size: 0.02 acre Date: 12/11/2019

Function/Value	Occurrence Y	Occurrence N	Rationale	Principal Function(s)	Comments
Flood Flow Alteration	X		Wetland is a depression with a slightly constricted outlet that has a depth of storage of 2-3 feet in a landscape that has surface flooding problems in a sub-basin down-gradient.	Y	Moderate function – The wetland is depressional with emergent vegetation and some woody vegetation to slow flows and retain floodwaters, but the wetland is relatively small compared to the drainage area.
Sediment Removal	X		Wetland is depressional, vegetated, and down slope of sediment sources from surrounding development.	Y	Moderate function – Wetland retains sediment associated with surface flows and is associated with a stream able to carry sediment. The wetland has low interspersion of vegetation and only a slightly constricted outlet. Stream velocity decreases in the wetland; however, the wetland is small.
Nutrient & Toxicant Removal	X		Wetland is depressional, vegetated, and down slope of nutrient sources from surrounding development in a sub-basin where an aquatic resource is on the 303(d) list and has a TMDL.	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.
Erosion Control & Shoreline Stabilization	X		Wetland is associated with a small stream and contains emergent and woody vegetation.	N	Low function – Erosion not present up or down stream. The wetland woody vegetation is not very dense. Culvert and berm barriers along the stream prevent natural floodplain development.
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 surrounding development. Species diversity is moderate but it has a slightly constricted outlet to export nutrients.
General Habitat Suitability	X		Wetland has three Cowardin classes and connectivity with stream and upland forest corridor.	N	Low function – Wetland is surrounded by developed upland (residential). Plant species diversity is moderate. Provides habitat for small mammals and passerines.

Habitat for Aquatic Invertebrates	X		Wetland has permanent and seasonal inundation and emergent vegetation is present in the ponded area.	Y	Moderate function – Associated with multiple water regimes with emergent vegetation in the ponded area. Low LWD and snags present. No aquatic bed vegetation is present.
Habitat for Amphibians	X		Wetland has permanent and 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. Buffer is disturbed and no amphibians were observed.
Habitat for Wetland-Associated Mammals	X		Wetland is associated with a permanently flowing stream.	N	Low function – No evidence of use. Ingress and egress of wetland mammals is restricted by surrounding development.
Habitat for Wetland-Associated Birds	X		Wetland has shallow, permanent open water habitat.	N	Low function – Wetland contains PEM/PSS/PFO habitat with a variety of hydrologic regimes. However, surrounding land is highly developed.
General Fish Habitat	X		Wetland is associated with a potentially fish-bearing stream.	N	Low function – Water depth in wetland is shallow. Buffer provides shade and detrital matter to support food base.
Native Plant Richness	X		Wetland contains three Cowardin classes.	N	Low to moderate function – Emergent is dominated by non-native reed canarygrass. Native shrubs are present. Matures trees are present.
Educational or Scientific Value		X	Majority of the 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. WTU-3 Project: ST I-405 BRT Project Assessed by: A. Brophy

Cowardin Class: PEM/PSS/PFO Ecology Category: IV Local Rating: IV Wetland size: 2.0 acres Date: 12/11/2019

Function/Value	Occurrence Y	Occurrence N	Rationale	Principal Function(s)	Comments
Flood Flow Alteration		X	Wetland is a slope.	N	
Sediment Removal		X	Wetland is a slope.	N	
Nutrient & Toxicant Removal		X	Wetland is a slope.	N	
Erosion Control & Shoreline Stabilization		X	Wetland is a slope.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent and woody vegetation and is permanently inundated and seasonally inundated during the growing season.	Y	Moderate function – Species diversity is moderate but it has a permanently flowing outlet to export nutrients.
General Habitat Suitability	X		Wetland has three Cowardin classes and connectivity with stream and upland forest corridor.	Y	Moderate function – Wetland is surrounded by developed upland (residential) and roads. Plant species diversity is moderate. Provides habitat for small mammals and passerines.
Habitat for Aquatic Invertebrates	X		Wetland has permanent inundation and emergent vegetation is present in the ponded area.	N	Low to moderate function – Associated with stream and emergent in ponded areas. No aquatic bed and low amounts of LWD.
Habitat for Amphibians	X		Wetland has permanent and seasonal ponding and emergent and woody vegetation, able to support egg masses, is present. Wetland associated with stream and receives flood waters. Wetland contains still and moving water.	Y	Moderate function – Emergent and woody vegetation in seasonal and permanently ponded areas. Frogs were heard in wetland area but not observed. Low LWD in ponded areas. Buffer partially disturbed but forested upland present.
Habitat for Wetland-Associated Mammals	X		Wetland is associated with permanently flowing stream and permanently ponded habitat.	Y	Moderate function – Interspersion of vegetation and water is present in wetland. Trees and shrubs present in wetland and buffer.

Habitat for Wetland-Associated Birds		X	Wetland does not have shallow open water habitat.	N	
General Fish Habitat		X	Wetland is a slope.	N	
Native Plant Richness	X		Wetland contains three Cowardin classes.	N	Low to moderate function – Dominated by non-native emergent plant species. Native shrubs are present. Matures trees are present.
Educational or Scientific Value		X	Majority of the wetland is along SR 518.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

Wetland Functions & Values Form

Wetland I.D. WTU-4 Project: ST I-405 BRT Project Assessed by: A. Brophy

Cowardin Class: PEM Ecology Category: IV Local Rating: IV Wetland size: 0.01 acre Date: 12/11/2019

Function/Value	Occurrence Y	Occurrence N	Rationale	Principal Function(s)	Comments
Flood Flow Alteration	X		Wetland is a depression with a slightly constricted outlet that has a depth of storage is less than 6 inches in a landscape that has surface flooding problems in a sub-basin down-gradient.	Y	Moderate function – The wetland is depressional with emergent vegetation vegetation to slow flows and retain floodwaters, but the wetland is relatively small compared to the drainage area.
Sediment Removal	X		Wetland is depressional, vegetated, and down slope of sediment sources from surrounding development and road.	Y	Moderate function – Wetland retains sediment associated with surface flows. The wetland has low interspersion of vegetation and only a slightly constricted outlet. Stream velocity decreases in the wetland; however, the wetland is small.
Nutrient & Toxicant Removal	X		Wetland is depressional, vegetated, and down slope of nutrient sources from surrounding development in a sub-basin where an aquatic resource is on the 303(d) list and has a TMDL.	Y	Moderate function – Water slows down and is held in the wetland. Ponding permanently and seasonally present. Dense emergent vegetation to use the excess nutrients.
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a stream.	N	
Production of Organic Matter and its Export	X		Wetland contains emergent and woody vegetation and is seasonally and permanently inundated.	N	Low function – Wetland receives storm flows from surrounding development and road. Species diversity is moderate but it has a slightly constricted outlet to export nutrients.
General Habitat Suitability		X	Wetland has one Cowardin class.	N	

Habitat for Aquatic Invertebrates	X		Wetland has permanent and seasonal inundation and emergent vegetation is present in the ponded area.	N	Low 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 permanent and seasonal ponding and emergent vegetation is present.	N	Low function – Emergent vegetation in ponded areas, but most not conducive to support amphibian egg masses. Buffer is disturbed and no amphibians were observed.
Habitat for Wetland-Associated Mammals	X		Permanent water is present within the wetland.	N	Low function – No evidence of use. Ingress and egress of wetland mammals is restricted by surrounding development.
Habitat for Wetland-Associated Birds		X	Wetland does not have shallow open water.	N	
General Fish Habitat		X	Wetland is not associated with a fish-bearing stream.	N	
Native Plant Richness		X	Wetland contains one Cowardin class.	N	
Educational or Scientific Value		X	Wetland is located along SR 518.	N	
Uniqueness and Heritage		X	Wetland is not rare or designated a wetland of local significance.	N	

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