



## **CRITICAL AREAS REPORT**

**FOR**

**SNOHOMISH COUNTY PUD No. 1**  
**TWIN CITY SUBSTATION**  
**STANWOOD, WA**

*Wetland Resources, Inc. Project #17002*

Prepared By

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## 1.0 INTRODUCTION

*Wetland Resources, Inc. (WRI)* performed a delineation on October 2, 2018, within the 16.8-acre property located at 7400 Pioneer Highway (Parcels 32042900201100, 32042900300700, 32042900301000). The purpose of the delineation was to flag jurisdictional wetlands and streams on the site and to estimate critical area boundaries off-site within 300 feet.

The intent of this document is to characterize critical areas and buffers in the vicinity of the subject property and assess potential impacts associated with the applicant's development proposal.



**Figure 1** - Aerial view of the subject property.

## 1.1 SITE DESCRIPTION

The subject property is located in the city limits of Stanwood, Washington, and is accessed from the north via a gravel driveway from Pioneer Highway. The property was historically used as a gravel mine and currently contains no structures. It was approved for a 58-lot residential subdivision in 2014, known as Valley Ridge Estates.

Two streams (Church Creek/Jorgenson Slough and Stream A) and one wetland (Wetland A) were observed on or near the subject property. The FEMA floodplain also extends onto the subject property. No other regulated critical areas are known to exist on or near the subject property.

Church Creek, which becomes Jorgenson Slough on the south side of the BNSF railroad tracks, is located off-site to the east of the site, flowing southwest along the eastern property line. Although the creek and the slough are located in unincorporated Snohomish County, the features are

designated as Shorelines of the State (Type S), which require 150-foot buffers under Stanwood Municipal Code (SMC 17.130.060-SMP). Stream A is an agricultural ditch that is a tributary to Jorgenson Slough, and conveys flows from Wetland A. Stream A has moderate potential for fish use, is greater than two feet bankfull width, and is not designated as a Shoreline. Streams with these characteristics are classified as Type 3 watercourses, and require 100-foot protective buffers per SMC 17.130.050 and 17.130.060.

Wetland A was rated in accordance with the 2014 Update Wetland Rating System, as required by SMC 17.125.050. Wetland A is a Category III “associated” Shoreline wetland, with a total score of 19 points and 5 points for habitat functions. Wetland A requires a 60-foot protective buffer per SMC 17.125.060-SMP(1)(c).

## **1.2 PROJECT DESCRIPTION**

A new electrical substation is required in the Stanwood area to meet rising power demands. A “no development” alternative is not feasible while still providing adequate power resources to the area. Site selection was driven by a number of factors, including geography, critical areas, and overall development costs. The site that was chosen is located in the area where power demands are increasing. It is also located along an existing transmission line, providing significant cost savings by avoiding transmission line construction.

Proposed development was carefully planned to avoid impacts to critical areas and buffers. It was determined that the substation, access road, and associated improvements can be placed in the area where the residential development had been approved and that all impacts to critical areas and buffers can be avoided. Development is mostly limited to historically disturbed areas from gravel mining. All of the proposed work will occur outside of wetlands, streams, buffers, the FEMA floodplain, and shoreline jurisdiction (200 feet from Church Creek and Jorgenson Slough). A map, including the proposed development, is included in Appendix B.

The project will require the following permits:

- Site Development Permit
- Grading Permit
- Right-of-way Use Permit
- Building Permits

Since no impacts to critical areas or buffers are proposed, this project meets the first order of preference within mitigation sequencing (SMC 17.114.180(4)(a)): *Avoiding the impact altogether by not taking a certain action or parts of an action.* All impacts are avoided, so no further application of mitigation sequencing is required. No mitigation measures are required to offset impacts, so performance standards are not necessary.

Stormwater management is a required element of the proposed development. The following is an excerpt from the drainage report submitted as part of the permit package: *Precipitation falling on-site is lost by evaporating, transpiring through vegetation, and infiltrating through the fill and/or granular advance outwash soil layers. Site soils are favorable for stormwater infiltration. On-site BMP's will be employed to disperse*



and infiltrate stormwater runoff within the project site. Where stormwater runoff concentrates along the access road, said water will be collected and discharged into an infiltration trench or pond where it will percolate into the soil. This proposal will not result in any impacts to site drainage patterns.

### 1.3 CRITICAL AREA CLASSIFICATIONS

#### 1.3.1 Cowardin System

According to the Cowardin System, as described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin 1979), the classifications for the critical areas associated with this site are as follows:

- **Wetland A:** Palustrine, Forested Wetland, Broad-leaved Deciduous, Seasonally Flooded/Saturated
- **Church Creek/Jorgenson Slough:** Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel, Permanently Flooded south of Pioneer Highway, and Upper Perennial north of Pioneer Highway
- **Stream A:** Riverine, Intermittent, Streambed, Mud

#### 1.3.2 City of Stanwood

According to Stanwood Municipal Code, Title 17, the critical areas associated with this site are classified as follows:

- **Wetland A:** This wetland is classified as a Category III wetland, as determined through the *Washington State Wetland Rating System for Western Washington - 2014 Update* (Hruby, 2014). The wetland received a total score of 19 points with 5 points for habitat functions, which requires a 60 foot buffer per SMC 17125.060-SMP(1)(c).
- **Church Creek/Jorgenson Slough:** This stream is designated as a Shoreline of the State and is therefore classified as a Type S stream. Type S streams require 150-foot buffers per SMC 17.130.060-SMP.
- **Stream A:** Stream A has moderate potential for fish use, is greater than two feet bankfull width, and is not designated as a Shoreline. Streams with these characteristics are classified as Type 3 watercourses, and require 100-foot protective buffers per SMC 17.130.050 and 17.130.060.

## **2.0 STATEMENT OF QUALIFICATIONS**

The work for this Report was conducted by Niels Pedersen and John Laufenberg.

Niels Pedersen holds a Bachelor of Arts degree in Environmental Policy and Urban Planning from Western Washington University's Huxley College of the Environment. His education focused on federal, state and local environmental regulations, natural resource economics, and ecology, with specific coursework and volunteer work in Alternative Dispute Resolution. Niels successfully completed a one-year post-baccalaureate program in Wetland Science and Management, offered by the University of Washington, as well as numerous continuing education classes. His work focuses on reconnaissance, delineation, ordinary high water mark identification, and mitigation planning, with a focus on waterfront projects. Mr. Pedersen became a certified Professional Wetland Scientist (PWS) in 2019.

John Laufenberg is a principal ecologist and owner, with over 25 years of experience with critical area issues at Wetland Resources. He holds a Bachelor of Arts degree in Environmental Studies from the University of Washington and has completed numerous continuing education classes. He has conducted a wide range of work in reconnaissance, delineation, ordinary high water mark identification, and mitigation planning in scores of jurisdictions throughout eastern and western Washington. Project experience includes residential, commercial, industrial, and utility projects in both the private and public sectors. John specializes in utility projects, with vast experience managing projects that occur in or near critical areas. Mr. Laufenberg became a certified Professional Wetland Scientist (PWS) in 2007.

## **3.0 CRITICAL AREA DETERMINATION REPORT**

### **3.1 PUBLICLY AVAILABLE INFORMATION**

Prior to conducting the site investigation, public resource information was reviewed to gather background information on the subject site and the surrounding area in regard to wetlands, streams, and other critical areas. These sources included the USFWS National Wetlands Inventory (NWI), USDA/NRCS Web Soil Survey, Snohomish County PDS Map Portal, WDFW SalmonScape mapping tool, WDFW Priority Habitat and Species (PHS) Interactive Map, City of Stanwood Map, and the DNR Forest Practices Application Mapping Tool (DNR-FPAMT).

#### *USFWS National Wetlands Inventory*

NWI depicts one palustrine, scrub-shrub wetland along the western boundary of the site. A palustrine, emergent wetland is mapped approximately 500 feet off-site to the north of the subject property. Jorgenson Slough is displayed approximately 300 feet off-site to the south of the subject property. The Stillaguamish River is mapped approximately 0.2 miles off-site to the south of the subject property.

#### *NRCS Web Soil Survey*

Approximately 50% of the site is mapped as Pits soil type, 19% is Puget silty clay loam, 15% is Tokul-Winston gravelly loams 25-65 percent slopes, and 12% is Bellingham silty clay loam. Puget

and Bellingham are listed as hydric soils.

*Snohomish County PDS Map Portal*

This resource depicts a Snohomish County inventoried freshwater forested/shrub wetland in the eastern portion of the property. Jorgenson Slough/Church Creek is mapped as a Shoreline of Statewide Significance.

*WDFW SalmonScape*

This resource depicts Jorgenson Slough/Church Creek as habitat for Fall Chinook salmon, Coho salmon, Pink salmon, Chum salmon, Winter Steelhead, Bull Trout, and Cutthroat Trout.

*WDFW Priority Habitats and Species*

This resource depicts a forested/shrub wetland in the eastern portion of the property. Swan habitat is mapped generally south of the property. This resource also depicts Jorgenson Slough/Church Creek as habitat for Fall Chinook salmon, Coho salmon, Pink salmon, Chum salmon, Winter Steelhead, Bull Trout, and Cutthroat Trout.

*City of Stanwood Shoreline Map*

This map depicts Jorgenson Slough/Church Creek as Shoreline, with Shoreline Residential and Shoreline Conservancy designations.

*WDNR Forest Practices Application Mapping Tool*

This resource depicts Jorgenson Slough/Church Creek as a Type S stream.

### **3.2 WETLAND AND STREAM DETERMINATION METHODOLOGY**

The methodologies used for this determination, as described below, are considered Best Available Science for wetlands and streams in Washington State.

Ordinary High Water Mark (OHWM) boundaries of lakes, streams, and marine waters are determined through use of methodology presented in *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al 2016). Classification of streams and lakes is consistent with the water typing system established in the Washington Administrative Code (WAC) 222-16-030.

Wetland boundaries were determined using the routine approach described in the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (U.S. Army Corps of Engineers 2010). Under the routine methodology, the process for making a wetland determination is based on three steps:

- 1.) Examination of the site for hydrophytic vegetation (species present and percent cover);
- 2.) Examination of the site for hydric soils;
- 3.) Determining the presence of wetland hydrology

On-site critical areas were delineated and surveyed, as depicted on the attached map and associated site development plans. Off-site critical areas lie on private properties that were not accessible, so these boundaries were approximated to the best of our ability.

### **3.2.1 Hydrophytic Vegetation Criteria**

The Corps Manual and 2010 Regional Supplement define hydrophytic vegetation as “the assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence.” Field indicators are used to determine whether the hydrophytic vegetation criteria have been met. Examples of these indicators include, but are not limited to, the rapid test for hydrophytic vegetation, a dominance test result of greater than 50%, and/or a prevalence index score less than or equal to 3.0.

### **3.2.2 Soils Criteria and Mapped Description**

The 2010 Regional Supplement (per the National Technical Committee for Hydric Soils) defines hydric soils as soils “that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.” Field indicators are used to determine whether a given soil meets the definition for hydric soils. Indicators are numerous and include, but are not limited to, presence of a histosol or histic epipedon, a sandy gleyed matrix, depleted matrix, and redoximorphic depressions.

According to NRCS Web Soil Survey, the soils on the project site include Bellingham silty clay loam, Pits, Puget silty clay loam, and Tokul-Winston gravelly loams, 25 to 65 percent slopes.

Bellingham silty clay loam: a very deep, poorly drained soil in depressional areas. It formed in alluvium and lacustrine sediment. Typically, the surface layer is very dark gray silty clay loam about 9 inches thick. The subsoil to a depth of 60 inches or more is mottled, gray and olive silty clay. Included in this unit are small areas of Terric Medisaprists, very poorly drained organic soils, Norma soils along upland drainageways, Kitsap and Pastik soils on terraces and Bellingham soils that have been drained. Included soils make up about 10 percent of the total acreage. Permeability of this Bellingham soil is slow. Available water capacity is high. Bellingham silty clay loam is listed as hydric on the Hydric Soils List for Washington State. Soils in the wetland portions of the site appear to match the description for Bellingham silty clay loam.

Puget silty clay loam: a very deep soil in depressional areas on flood plains. It has been artificially drained. The soil formed in alluvium. Typically, the surface layer is dark grayish brown silty clay loam about 9 inches thick. The underlying material to a depth of 60 inches or more is olive gray and gray silty clay loam. In some areas the soil is not drained and is not protected from flooding. Included in this unit are areas of Snohomish, Sumas, Sultan, and Pilchuck soils on flood plains and Puyallup soils on stream terraces. Puget, Snohomish, and Sumas, soils are listed on the Hydric Soils List for Washington State.

Tokul-Winston gravelly loam, 25-65 percent slopes: a moderately deep, moderately well drained soil on till plains and terrace escarpments. This soil formed in glacial till and volcanic ash. This unit is about 50 percent Tokul gravelly loam and 30 percent Winston gravelly loam. Typically, the surface is covered with a mat of leaves, twigs, and decomposed litter about 2 inches thick. The

surface layer is dark brown gravelly loam about 4 inches thick. The subsoil is brown, strong brown, and dark yellowish brown gravelly loam about 18 inches thick. A hardpan is at a depth of about 20-40 inches. Permeability of this soil is moderate to the hardpan and very slow through it. Available water capacity is moderate. Included in this unit are areas of McKenna and Norma soils in depressional areas along drainageways on till plains, Terric Medisaprists in depressional areas on till plains, Winston and Pastik soils on terraces and outwash plains, and Ragnar soils on outwash plains. Included areas make up about 25 percent of the total acreage. McKenna and Norma soils are listed as hydric on the Hydric Soils List for Washington State.

### 3.2.3 Hydrology Criteria

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season. Areas with evident characteristics of wetland hydrology are those where the presence of water has an overriding influence on the characteristics of vegetation and soils due to anaerobic and chemically reducing conditions, respectively. The strongest indicators include the presence of surface water, a high water table, and/or soil saturation within at least 12 inches of the soil surface.

### 3.3 WETLAND AND STREAM BOUNDARY DETERMINATION FINDINGS

Based on the results of the site investigation, one wetland is located on the subject site, and Church Creek/Jorgenson Slough and an unnamed tributary to Jorgenson Slough are located near the site.

Critical Area	Critical Area Classification	Buffer Requirement
Wetland A*	Category III	60'
Church Creek/ Jorgenson Slough	Type S	150'
Stream A	Type 3	100'
FEMA Floodplain	Zone AE	N/A

\*Associated Wetland (SMP)

**Table 1 - Critical Area Classifications**



### 3.3.1 Wetland A

**Cowardin classification:** Palustrine, Forested Wetland, Broad-leaved Deciduous, Seasonally Flooded/Saturated

**HGM Rating Class:** Depressional

**Ecology Rating and Habitat Score:** 19/5

**Ecology Rating:** Category III

**City of Stanwood SMP Buffer:** 60'



**Figure 2** – Photograph of on-site portion of Wetland A.

Wetland A received an overall score of 19 points on the DOE Rating System, with a habitat functions score of 5 points. Wetlands with overall scores between 16 and 19 are classified as Category III wetlands. In the City of Stanwood, Category III Shoreline wetlands with 5 habitat points receive buffers of 60 feet.



### **3.3.2 Church Creek/ Jorgenson Slough (Off-site)**

**Type:** S

**City of Stanwood Buffer:** 150'

### **3.3.3 Stream A (Off-site)**

**Type:** 3

**City of Stanwood Buffer:** 100'

### **3.3.4 Non-wetland Areas**

The site was historically mined for gravel. The remaining hill slopes along the north and northeast sides contain a mixed coniferous/deciduous forest, dominated by red alder and Douglas-fir. The mined areas are vegetated with a combination of weedy species, including Scot's broom, common horsetail, Canada thistle, tansy, and Himalayan blackberry.

## **3.4 WILDLIFE ASSESSMENT**

Wetlands, streams, and their associated buffers contain resources for wildlife such as food, water, thermal cover, and refuge in close proximity. Given the habitat available, the following mammalian species may use the area: bats (*Myotis spp.*), Columbian black-tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), deer mouse (*Peromyscus maniculatus*), eastern cottontail rabbit (*Sylvilagus floridanus*), moles (*Scapanus spp.*), raccoon (*Procyon lotor*), shrews (*Sorex spp.*), skunks (*Mephitis spp.*), squirrels (*Sciurus griseus*, *Tamiasciurus douglasii*), and Virginia opossum (*Didelphis virginiana*). The following avian species are expected to use the area: American Crow (*Corvus brachyrhynchos*), Stellar's Jay (*Cyanocitta stelleri*), Black-capped Chickadee (*Poecile atricapillus*), Dark-eyed Junco (*Junco hyemalis*), Spotted Towhee (*Pipilo maculatus*), Bushtit (*Psaltirparus minimus*), Northern Flicker (*Colaptes auratus*), Hairy Woodpecker (*Picoides villosus*), Downy Woodpecker (*Dendrocopos villosus*), Red-breasted Nuthatch (*Sitta canadensis*), Brown Creeper (*Certhia americana*), Varied Thrush (*Ixoreus naevius*), and Red-tailed Hawk (*Buteo jamaicensis*). Other wildlife expected to use this site include: pacific tree frog (*Hyla regilla*), northwestern salamander (*Ambystoma gracile*), and rough-skinned newt (*Taricha granulosa*). These lists are not meant to be all-inclusive and may omit species that currently utilize or could utilize the site. No threatened or endangered terrestrial species are known to be associated with this site.

## **4.0 PERMANENT PROTECTION**

In Stanwood, regulated streams, wetlands, and their buffers are designated collectively as Native Growth Protection Areas (NGPAs), as described in SMC 17.114.240. Native Growth Protection Areas shall be recorded on all documents of title of record for all affected lots.

Native growth protection areas shall be designated on the face of the plat or recorded drawing in a format approved by the city attorney. The designation shall include the following restrictions:

- (a) An assurance that native vegetation will be preserved for the purpose of preventing harm to the property and the environment, including, but not limited to, controlling

- surface water runoff and erosion, maintaining slope stability, buffering, and protecting plants, fish and animal habitat; and
- (b) The right of the city to enforce the terms of the restriction.

## 5.0 CONCLUSION

The proposed development of the site will occur outside of all wetlands, streams, buffers, floodplains, and shorelines, so no direct impacts to these resources will occur.

Wetland and stream delineation, classification and assessment has conformed to best available science. The preparation and adoption of municipal codes also require the application of best available science in determining wetland and stream classifications and required buffer widths. This project and others in the vicinity must meet municipal code requirements to prevent direct and cumulative impacts to critical areas. Since best available science was applied in preparation of the codes, and this project meets the requirements of the codes, no cumulative impacts to critical areas are anticipated from this project or those that may occur nearby in the future.

## 6.0 USE OF THIS REPORT

This Critical Area Report is supplied to Snohomish County PUD No. 1 as a means of determining the presence of on-site and adjacent critical areas. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to critical areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

This report conforms to the standard of care employed by professional ecologists in Western Washington. The information presented herein is accurate to the best of our knowledge. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.



Niels Pedersen, PWS  
*Senior Ecologist*



John Laufenberg, PWS  
*Principal*

## 7.0 REFERENCES

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Appendix A  
DOE Wetland Rating Forms and Figures

Wetland name or number A

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A - PUD Twin City Date of site visit: 12/3/19

Rated by ED/JL Trained by Ecology? ☒ Yes ☐ No Date of training Sept 2015

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

**NOTE: Form is not complete without the figures requested (figures can be combined).**

Source of base aerial photo/map Snohomish County

**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

☒ Category III – Total score = 16 - 19

         Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Circle the appropriate ratings				
Site Potential	H M <u>L</u>	H <u>M</u> L	H <u>M</u> L	
Landscape Potential	H <u>M</u> L	<u>H</u> M L	H M <u>L</u>	
Value	<u>H</u> M L	<u>H</u> M L	H <u>M</u> L	<b>TOTAL</b>
Score Based on Ratings	<b>6</b>	<b>8</b>	<b>5</b>	<b>19</b>

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

9 = H,H,H

8 = H,H,M

7 = H,H,L

7 = H,M,M

6 = H,M,L

6 = M,M,M

5 = H,L,L

5 = M,M,L

4 = M,L,L

3 = L,L,L

### 2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	<input checked="" type="checkbox"/>



Wetland name or number A

## Maps and figures required to answer questions correctly for Western Washington

### Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet ( <i>can be added to map of hydroperiods</i> )	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland ( <i>can be added to another figure</i> )	D 2.2, D 5.2	1
Map of the contributing basin	D 4.3, D 5.3	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	2
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	3
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	4

### Riverine Wetlands

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

### Lake Fringe Wetlands

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

### Slope Wetlands

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

Wetland name or number **A**\_\_\_\_\_

## HGM Classification of Wetlands in Western Washington

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

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

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

**NO** – go to 2

**YES** – the wetland class is **Tidal Fringe** – go to 1.1

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

**NO** – **Saltwater Tidal Fringe (Estuarine)**

**YES** – **Freshwater Tidal Fringe**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

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

**NO** – go to 3

**YES** – The wetland class is **Flats**

*If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

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

    The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;

    At least 30% of the open water area is deeper than 6.6 ft (2 m).

**NO** – go to 4

**YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

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

    The wetland is on a slope (*slope can be very gradual*),

    The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,

    The water leaves the wetland **without being impounded**.

**NO** – go to 5

**YES** – The wetland class is **Slope**

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

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

    The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,

    The overbank flooding occurs at least once every 2 years.

Wetland name or number A**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	<input type="checkbox"/>	Riverine
Slope + Depressional	<input type="checkbox"/>	Depressional
Slope + Lake Fringe	<input type="checkbox"/>	Lake Fringe
Depressional + Riverine along stream within boundary of depression	<input type="checkbox"/>	<b>Depressional</b>
Depressional + Lake Fringe	<input type="checkbox"/>	Depressional
Riverine + Lake Fringe	<input type="checkbox"/>	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	<input type="checkbox"/>	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 A

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

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

<b>D 2.0. Does the landscape have the potential to support the water quality function of the site?</b>		
<b>D 2.1. Does the wetland unit receive stormwater discharges?</b>	Yes = 1 No = 0	<b>1</b>
<b>D 2.2. Is &gt; 10% of the area within 150 ft of the wetland in land uses that generate pollutants?</b>	Yes = 1 No = 0	<b>1</b>
<b>D 2.3. Are there septic systems within 250 ft of the wetland?</b>	Yes = 1 <b>No = 0</b>	<b>0</b>
<b>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?</b> Source _____	Yes = 1 <b>No = 0</b>	<b>0</b>
<b>Total for D 2</b>	<b>Add the points in the boxes above</b>	<b>2</b>

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

<b>D 3.0. Is the water quality improvement provided by the site valuable to society?</b>		
<b>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?</b>	Yes = 1 No = 0	<b>1</b>
<b>D 3.2. Is the wetland in a basin or sub-basin where an aquatic resource is on the 303(d) list?</b>	Yes = 1 No = 0	<b>1</b>
<b>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)?</b>	Yes = 2 No = 0	<b>2</b>
<b>Total for D 3</b>	<b>Add the points in the boxes above</b>	<b>4</b>

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

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Wetland name or number A**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:

- |   |            |          |
|---|------------|----------|
| <input type="checkbox"/> Wetland is a depression or flat depression with no surface water leaving it (no outlet)                            | points = 4 | <b>2</b> |
| <input checked="" type="checkbox"/> Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet | points = 2 |          |
| <input type="checkbox"/> Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch                      | points = 1 |          |
| <input type="checkbox"/> 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.

- |   |            |          |
|---|------------|----------|
| <input type="checkbox"/> Marks of ponding are 3 ft or more above the surface or bottom of outlet  | points = 7 | <b>0</b> |
| <input type="checkbox"/> Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet | points = 5 |          |
| <input type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet     | points = 3 |          |
| <input type="checkbox"/> The wetland is a "headwater" wetland                                     | points = 3 |          |
| <input type="checkbox"/> Wetland is flat but has small depressions on the surface that trap water | points = 1 |          |
| <input checked="" type="checkbox"/> 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.

- |  |            |          |
|--|------------|----------|
| <input checked="" type="checkbox"/> The area of the basin is less than 10 times the area of the unit | points = 5 | <b>5</b> |
| <input type="checkbox"/> The area of the basin is 10 to 100 times the area of the unit               | points = 3 |          |
| <input type="checkbox"/> The area of the basin is more than 100 times the area of the unit           | points = 0 |          |
| <input type="checkbox"/> Entire wetland is in the Flats class  | points = 5 |          |

Total for D 4

Add the points in the boxes above

**7****Rating of Site Potential** If score is: 12-16 = H ✓ 6-11 = M 0-5 = L

Record the rating on the first page

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

D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	<b>1</b>
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	<b>1</b>
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	<b>1</b>
Total for D 5	Add the points in the boxes above	<b>3</b>

**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):

- |  |            |          |
|--|------------|----------|
| <input checked="" type="checkbox"/> • Flooding occurs in a sub-basin that is immediately down-gradient of unit.  | points = 2 | <b>2</b> |
| <input type="checkbox"/> • Surface flooding problems are in a sub-basin farther down-gradient.   | points = 1 |          |
| <input type="checkbox"/> Flooding from groundwater is an issue in the sub-basin.   | points = 1 |          |
| <input type="checkbox"/> The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why _____ | points = 0 |          |
| <input type="checkbox"/> There are no problems with flooding downstream of the wetland.  | points = 0 |          |

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

Yes = 2 No = 0

**0**

Total for D 6

Add the points in the boxes above

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

Record the rating on the first page

Wetland name or number A**These questions apply to wetlands of all HGM classes.****HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat**H 1.0. Does the site have the potential to provide habitat?**

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

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

**H 1.2. Hydroperiods**

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

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

**H 1.3. Richness of plant species**

Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup>.

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

If you counted: > 19 species

points = 2

**5 - 19 species**

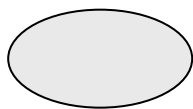
**points = 1**

< 5 species

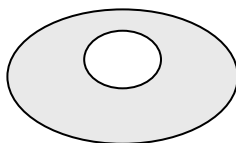
points = 0

**1****H 1.4. Interspersion of habitats**

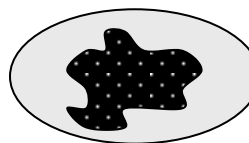
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



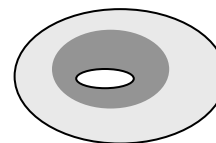
**None = 0 points**



**Low = 1 point**

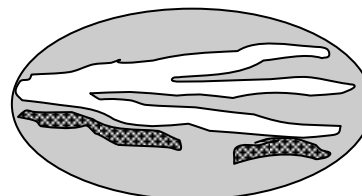
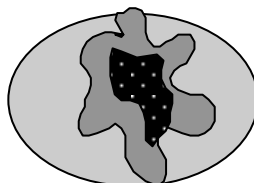
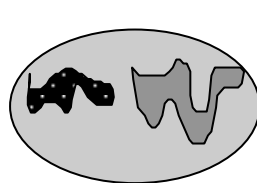


**Moderate = 2 points**

**3**

All three diagrams in this row

are **HIGH = 3 points**





Wetland name or number A

<b>H 1.5. Special habitat features:</b> Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). <input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) <b>and/or</b> overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present ( <i>cut shrubs or trees that have not yet weathered where wood is exposed</i> ) <input type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated ( <i>structures for egg-laying by amphibians</i> ) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants ( <i>see H 1.1 for list of strata</i> )		<b>2</b>
Total for H 1	Add the points in the boxes above	<b>11</b>

**Rating of Site Potential** If score is: 15-18 = H ☒ 7-14 = M 0-6 = L

Record the rating on the first page

<b>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</b>		
<b>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</b> <i>Calculate:</i> % undisturbed habitat <u>2</u> + [(% moderate and low intensity land uses)/2] <u>3</u> = <u>5</u> % If total accessible habitat is: <input type="checkbox"/> > 1/3 (33.3%) of 1 km Polygon points = 3 <input type="checkbox"/> 20-33% of 1 km Polygon points = 2 <input type="checkbox"/> 10-19% of 1 km Polygon points = 1 <input checked="" type="checkbox"/> < 10% of 1 km Polygon points = 0		<b>0</b>
<b>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</b> <i>Calculate:</i> % undisturbed habitat <u>12</u> + [(% moderate and low intensity land uses)/2] <u>9</u> = <u>21</u> % <input type="checkbox"/> Undisturbed habitat > 50% of Polygon points = 3 <input type="checkbox"/> Undisturbed habitat 10-50% and in 1-3 patches points = 2 <input checked="" type="checkbox"/> Undisturbed habitat 10-50% and > 3 patches points = 1 <input type="checkbox"/> Undisturbed habitat < 10% of 1 km Polygon points = 0		<b>1</b>
<b>H 2.3. Land use intensity in 1 km Polygon: If</b> <input checked="" type="checkbox"/> > 50% of 1 km Polygon is high intensity land use points = (- 2) <input type="checkbox"/> ≤ 50% of 1 km Polygon is high intensity points = 0		<b>-2</b>
Total for H 2	Add the points in the boxes above	<b>-1</b>

**Rating of Landscape Potential** If score is: 4-6 = H 1-3 = M ☒ < 1 = L

Record the rating on the first page

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

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

Record the rating on the first page

Wetland name or number A

## 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 A**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
<b>SC 1.0. Estuarine wetlands</b> Does the wetland meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt Yes – Go to <b>SC 1.1</b> No = <b>Not an estuarine wetland</b>	
<b>SC 1.1.</b> 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 = <b>Category I</b> No - Go to <b>SC 1.2</b>	<b>Cat. I</b>
<b>SC 1.2.</b> Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) <input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. <input type="checkbox"/> The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = <b>Category I</b> No = <b>Category II</b>	<b>Cat. I</b>  <b>Cat. II</b>
<b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b> <b>SC 2.1.</b> Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to <b>SC 2.2</b> No – Go to <b>SC 2.3</b> <b>SC 2.2.</b> Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = <b>Category I</b> No = <b>Not a WHCV</b> <b>SC 2.3.</b> Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a> Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b> No = <b>Not a WHCV</b> <b>SC 2.4.</b> Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = <b>Category I</b> No = <b>Not a WHCV</b>	<b>Cat. I</b>
<b>SC 3.0. Bogs</b> Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i> <b>SC 3.1.</b> 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 <b>SC 3.3</b> No – Go to <b>SC 3.2</b> <b>SC 3.2.</b> 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 <b>SC 3.3</b> No = <b>Is not a bog</b> <b>SC 3.3.</b> 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 = <b>Is a Category I bog</b> No – Go to <b>SC 3.4</b> <b>NOTE:</b> 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. <b>SC 3.4.</b> 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 = <b>Is a Category I bog</b> No = <b>Is not a bog</b>	<b>Cat. I</b>

Wetland name or number A

<p><b>SC 4.0. Forested Wetlands</b></p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <b><i>If you answer YES you will still need to rate the wetland based on its functions.</i></b></p> <p><input type="checkbox"/> <b>Old-growth forests</b> (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.</p> <p><input type="checkbox"/> <b>Mature forests</b> (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).</p> <p style="text-align: right;">Yes = <b>Category I</b>      No = <b>Not a forested wetland for this section</b></p>	<b>Cat. I</b>
<p><b>SC 5.0. Wetlands in Coastal Lagoons</b></p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p><input type="checkbox"/> The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p><input type="checkbox"/> The lagoon in which the wetland is located contains ponded water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>)</p> <p style="text-align: right;">Yes – Go to <b>SC 5.1</b>      No = <b>Not a wetland in a coastal lagoon</b></p> <p><b>SC 5.1. Does the wetland meet all of the following three conditions?</b></p> <p><input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).</p> <p><input type="checkbox"/> At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.</p> <p><input type="checkbox"/> The wetland is larger than 1/10 ac (4350 ft<sup>2</sup>)</p> <p style="text-align: right;">Yes = <b>Category I</b>      No = <b>Category II</b></p>	<b>Cat. I</b>       <b>Cat. II</b>
<p><b>SC 6.0. Interdunal Wetlands</b></p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <b><i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></b></p> <p>In practical terms that means the following geographic areas:</p> <p><input type="checkbox"/> Long Beach Peninsula: Lands west of SR 103</p> <p><input type="checkbox"/> Grayland-Westport: Lands west of SR 105</p> <p><input type="checkbox"/> Ocean Shores-Copalis: Lands west of SR 115 and SR 109</p> <p style="text-align: right;">Yes – Go to <b>SC 6.1</b>      No = <b>not an interdunal wetland for rating</b></p> <p><b>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)?</b> Yes = <b>Category I</b>      No – Go to <b>SC 6.2</b></p> <p><b>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?</b> Yes = <b>Category II</b>      No – Go to <b>SC 6.3</b></p> <p><b>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?</b> Yes = <b>Category III</b>      No = <b>Category IV</b></p>	<b>Cat I</b>       <b>Cat. II</b>    <b>Cat. III</b>    <b>Cat. IV</b>
<p><b>Category of wetland based on Special Characteristics</b></p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	<b>N/A</b>

Wetland name or number \_\_\_\_\_

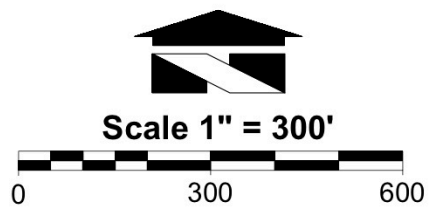
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# TWIN CITY SUBSTATION WETLAND RATING FIGURE 1 - WETLAND A



LEGEND	
	SCRUB-SHRUB
	EMERGENT VEGETATION
	FORESTED VEGETATION
	SATURATED ONLY
	SEASONALLY FLOODED
	150' FROM WL BOUNDARY



*Wetland Resources, Inc.*  
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 9505 19th Avenue S.E. Suite 106 Everett, Washington 98208  
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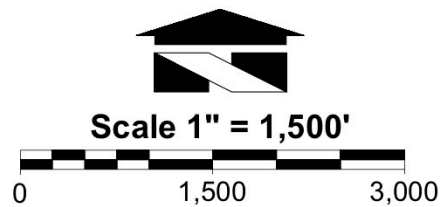
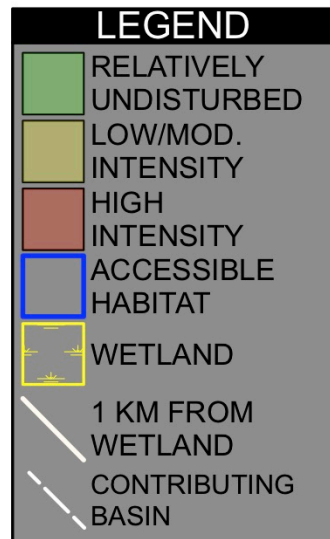
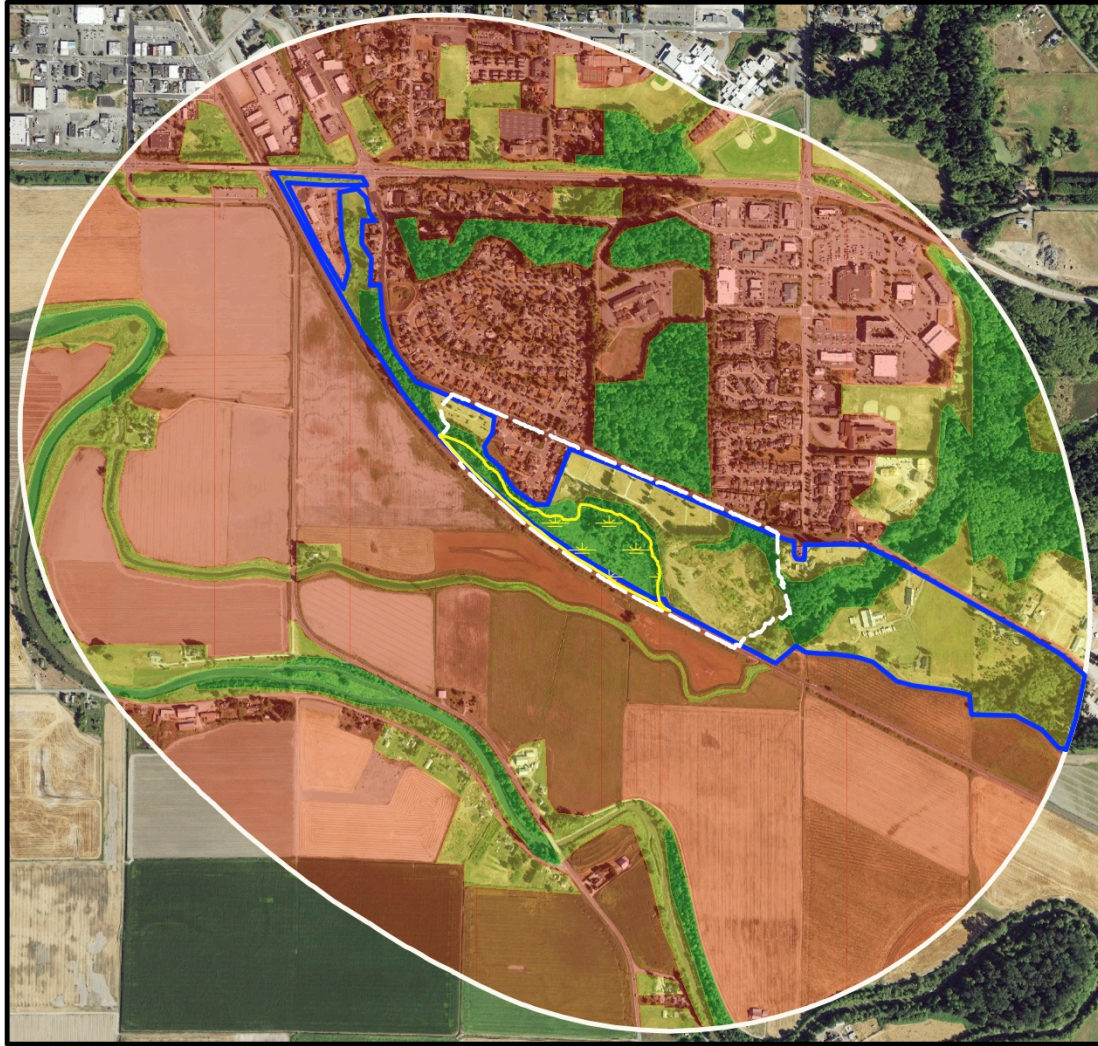
**WETLAND RATING  
Wetland A**

PUD No.1 of Snohomish Co  
 Attn: Jacob Dahl  
 PO Box 1107  
 Everett, WA 98206-1107

Figure A1  
 WRI Job # 17002  
 Rated by: ED



# TWIN CITY SUBSTATION WETLAND RATING FIGURE 2 - WETLAND A



**CONTRIBUTING BASIN  
AREA RELATIVE TO  
WETLAND UNIT IS 4.7:1**

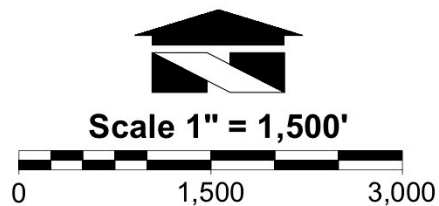
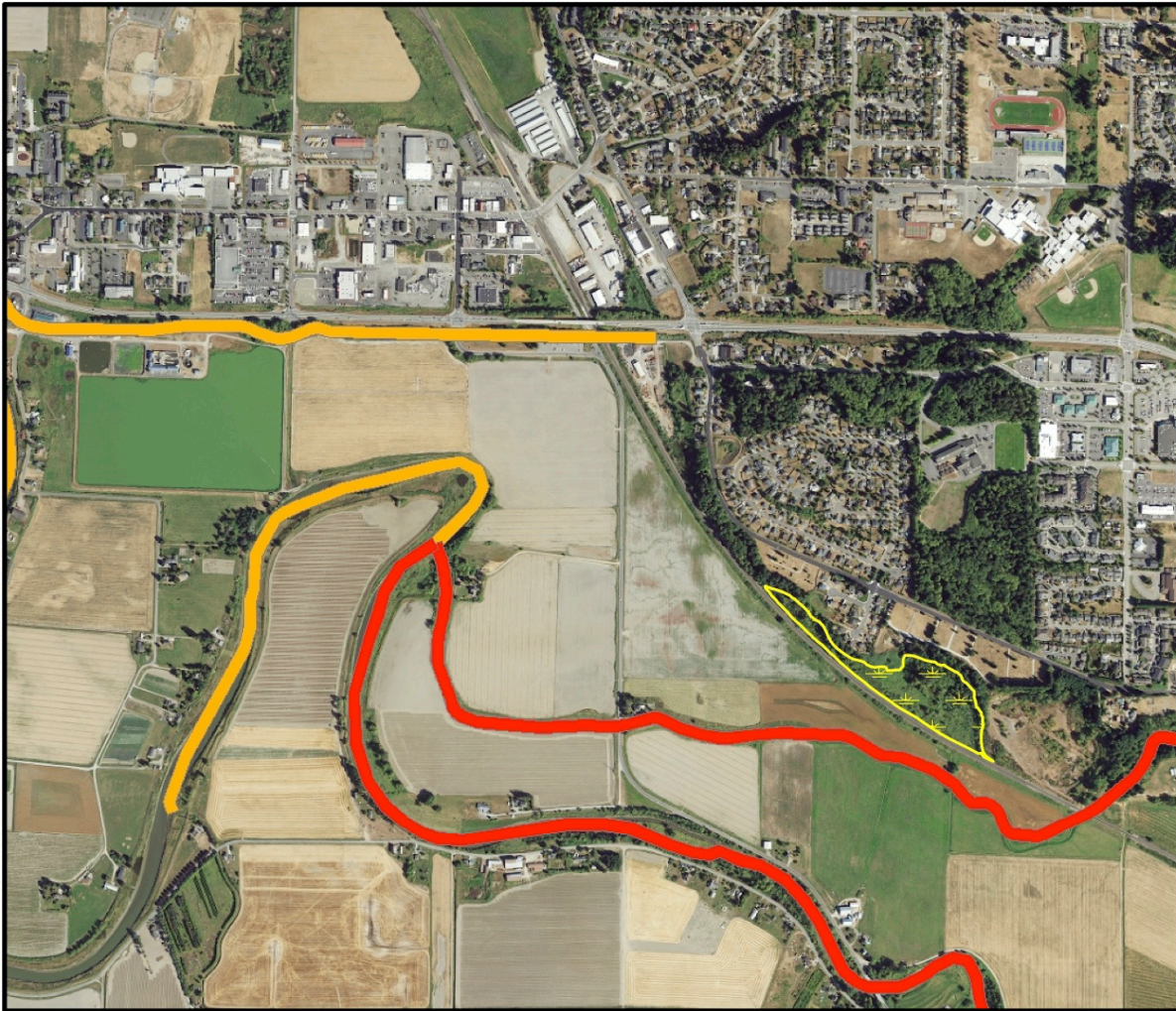
*Wetland Resources, Inc.*  
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**WETLAND RATING  
Wetland A**

PUD No.1 of Snohomish Co  
Attn: Jacob Dahl  
PO Box 1107  
Everett, WA 98206-1107  
Figure A2  
WRI Job # 17002  
Rated by: ED



TWIN CITY SUBSTATION  
WETLAND RATING FIGURE 3 - WETLAND A



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**WETLAND RATING  
Wetland D**

PUD No.1 of Snohomish Co  
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Everett, WA 98206-1107

Figure A3  
WRI Job # 17002  
Rated by: ED

# TWIN CITY SUBSTATION

## WETLAND RATING FIGURE 4 - WETLAND D

### WRIA 5: Stillaguamish

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

#### Counties

- [Skagit](#)
- [Snohomish](#)



Waterbody Name	Pollutant(s)	Status**	TMDL Lead
Old Stillaguamish Channel	Dissolved Oxygen	On hold	<a href="#">Ralph Svrjcek</a> 425-649-7165
<a href="#">Stillaguamish River</a>	Arsenic Dissolved Oxygen Fecal Coliform Mercury pH Temperature	Approved by EPA Has an implementation plan	<a href="#">Ralph Svrjcek</a> 425-649-7165

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

**Wetland Resources, Inc.**  
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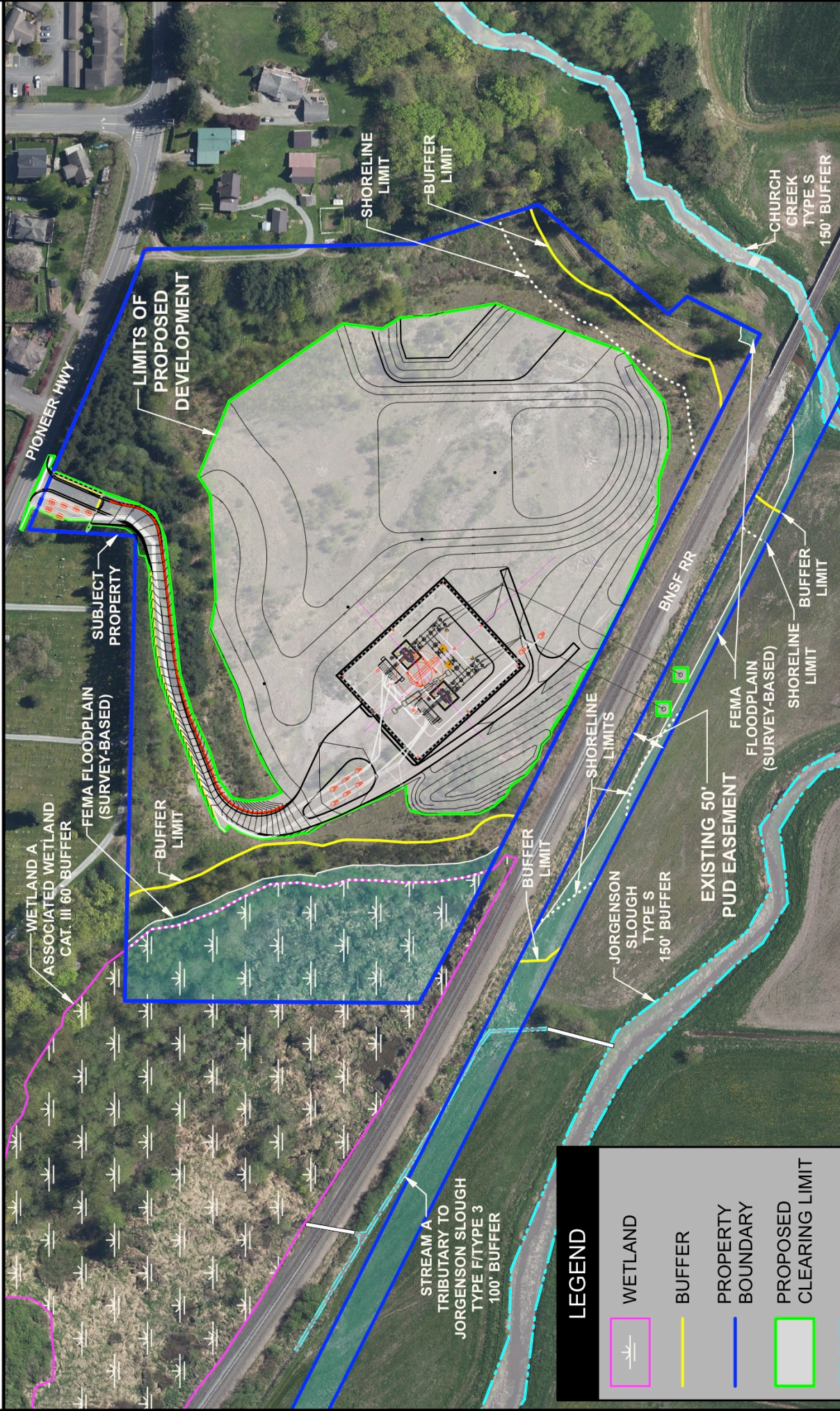
### WETLAND RATING Wetland D

PUD No.1 of Snohomish Co  
 Attn: Jacob Dahl  
 PO Box 1107  
 Everett, WA 98206-1107  
 Figure D-4  
 WRI Job # 17002  
 Rated by: ED

Appendix B  
Critical Area Map



# CRITICAL AREAS MAP TWIN CITY SUBSTATION



LEGEND

WETLAND

—

PROPERTY BOUNDARY

—

PROPOSED CLEARING LIMIT

—

STREAM

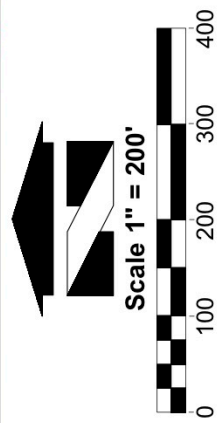
—

FEMA FLOODPLAIN

—

SHORELINE LIMITS

—



CRITICAL AREAS MAP

TWIN CITY SUBSTATION

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Sheet 1/1

Project No. 17002

Drawn by: NP

Date: 01.22.2020

Snohomish County PUD No. 1

Attn: Jacob Dahl

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Everett, WA 98206-1107