

Critical Areas Report and Restoration Plan

**Sultan River Side Channel 1 Extension
Sultan, Washington**

**Prepared for
Snohomish County Public Utility District No. 1**

**Prepared by
Herrera Environmental Consultants, Inc.**

Critical Areas Report and Restoration Plan

Sultan River Side Channel 1 Extension Sultan, Washington

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Note:

Some pages in this document have been purposely skipped or blank pages inserted so that this document will print correctly when duplexed.

DISCLAIMER

Herrera Environmental Consultants, Inc., has prepared this report for use by Snohomish County Public Utility District No. 1 (the District). The results and conclusions in this report represent the professional opinion of Herrera Environmental Consultants, Inc. They are based upon examination of public domain information concerning the study area, site investigation, and data analysis.

The field investigation was performed according to joint agency accepted jurisdictional wetland determination and ordinary high water mark determination. Wetland delineation protocols used the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010) and stream boundaries were determined using *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016). However, final determination of jurisdictional wetland boundaries and streams pertinent to Section 404 of the Clean Water Act is the responsibility of the Seattle District of the U.S. Army Corps of Engineers. Various agencies of the State of Washington and local jurisdictions may require a review of final site plans that could potentially affect zoning, buffer requirements, water quality, or habitat functions of lands in question. Therefore, the findings and conclusions in this report should be reviewed by appropriate regulatory agencies before any detailed site planning or construction activities.

HERRERA QUALIFICATIONS

Established in 1980, Herrera Environmental Consultants, Inc. is an innovative, employee-owned, consulting firm focused on three practice areas: water resources protection, ecological restoration, and sustainable development. The following staff authored this report and conducted field work in support of this report. A summary of their qualifications is provided.

Danielle Rapoza, PWS

Danielle is an ecologist with 8 years of experience in fisheries research, ecological restoration monitoring, water quality assessment, and flow monitoring. Danielle has been involved in pre- and post-restoration monitoring efforts on stream and wetland projects. Danielle is trained in biological assessments, wetland delineation, functional wetland assessment, the environmental policy framework, and summarizing results in reports.

Credentials

BA Planning and Environmental Policy, Western Washington University, Bellingham, 2007

Certificate in Wetland Science and Management, University of Washington, Seattle, 2018

WSDOT Junior Biological Assessment Author, 2020

Certified Professional Wetland Scientist (PWS) #3410, Society of Wetland Scientists, 2021

Liliana Hansen, PWS

Liliana is a senior scientist with 16 years of professional experience in wetland and stream delineations, floodplain habitat assessments, biological evaluations, shoreline assessments, mitigation/restoration design, and mitigation monitoring. She is experienced with project management and permitting projects at the local, state, and federal levels. She has conducted hundreds of critical areas delineations in Washington and led projects from initial stages of field work through permitting and 10 years of successful mitigation performance monitoring.

Credentials

BS Environmental Science, Western Washington University, Bellingham, 2003

Certified PWS #2755, Society of Wetland Scientists, 2016

Wetland Delineation Certification, Portland State University, 2004

Wetland and Upland Habitat Restoration Design, Portland State University, 2004

Tina Mirabile, PWS

Tina is a senior ecologist with over 20 years of professional natural resources management and wetland mitigation experience. Tina specializes in performing natural resource assessments of environmentally sensitive areas (wetlands, shorelines, and fish and wildlife habitat conservation areas), preparing wetland mitigation and natural habitat restoration plans, and securing federal, state, and local agency environmental permits for project compliance and authorization.

Credentials

MBA, University of Massachusetts, Boston, 1990

BA, Geology, Indiana University, Bloomington, 1983

Certified PWS #1705, Society of Wetland Scientists, 2006

WSDOT and ODOT Qualified Biological Assessment Author, 2016

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INTRODUCTION

Herrera Environmental Consultants, Inc. (Herrera) performed the wetland delineation, ordinary high water mark (OHWM) determinations, and restoration plan described in this report Snohomish County Public Utility District No. 1 (the District), in support of the Side Channel 1 Extension project (proposed project) on the east side of the Sultan River within the western portion of the Sultan city limits. The new side channel will tie into a previously constructed side channel ("Side Channel 1") of the Sultan River, which was created by the District in 2012. The new side channel will provide additional year-round salmon habitat. A riparian corridor will also be enhanced on both sides of the proposed side channel in areas that are currently cow pasture and within forested habitat.

Areas within approximately 200 feet of the proposed side channel alignment were investigated for the presence of wetlands, streams, and fish and wildlife habitat conservation areas (Figure 1) and are hereafter referred to as the study area in this report. The results of the site investigation including descriptions of the environmental site conditions; wetlands; streams; City of Sultan-designated protective buffer widths; and local, state, and federal laws and regulations are provided in the following sections.

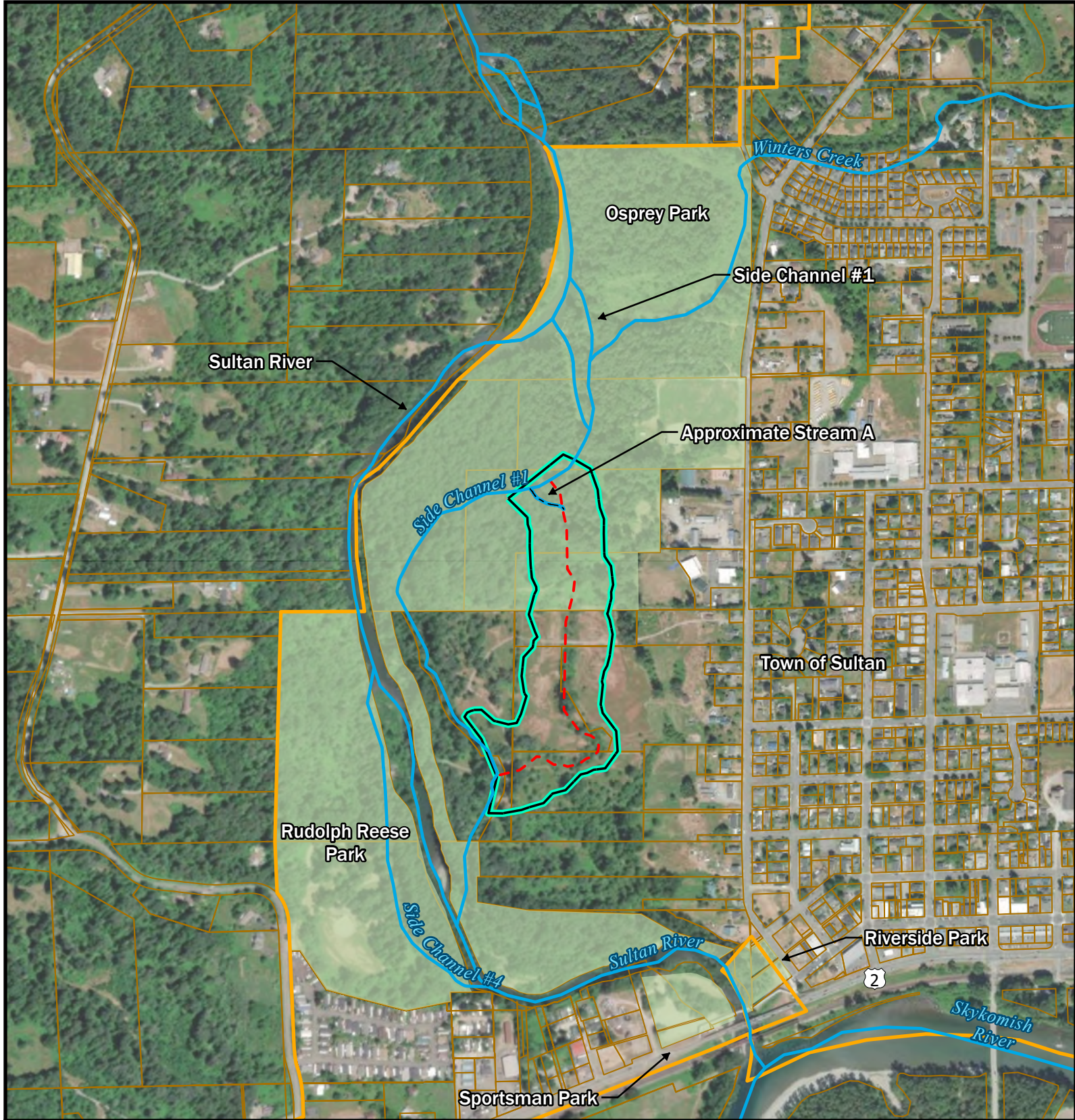
Project Setting

The proposed project is located amid five parcels with the following Snohomish County parcel identification numbers on the east side of the Sultan River: 28083100401900, 28083100400400, 28083100402300, 28083100400700, and 28083100401500. The proposed project is situated in the southeast portion of Section 31, Township 28 North, Range 08 East of the Willamette Meridian within the Sultan city limits, in Snohomish County, Washington. The project area is in the Lower Sultan River subbasin within the Snohomish Watershed, in Watershed Resource Inventory Area (WRIA) 7 – Snohomish.

Study Objectives

The objectives of this study were to:

- Identify wetlands and delineate wetland boundaries within approximately 200 feet of the proposed side channel extension.
- Rate wetlands to determine required buffer widths as established by the City of Sultan's (City's) municipal code (SMC 17.10.105).
- Delineate (flag) the OHWM of the existing Side Channel 1 that will connect with the new side channel extension.
- Identify applicable buffers, regulations, and guidance pertinent to other critical areas on site, if identified, set forth by local, state, and federal authorities.



Legend

- Study Area
- Rivers and Streams
- Approximate Stream A
- Historic Side Channel
- Sultan City Limits
- Parks
- Parcels



Figure 1.
Vicinity Map for the Side Channel 1 Extension Project.

0 250 500 1,000 Feet

HERRERA
Science + Planning + Design

Snohomish County, Esri Imagery (2022)

K:\Projects\Y2020\20-07466-001\Pro\Sultan_River_Side_Channel_Inlet\Sultan_River_Side_Channel_Inlet.aprx\Report_Fig1_VicinityMap

Applicable Laws and Regulations

Wetlands and streams are subject to a variety of federal, state, and local regulations. Federal laws regulating wetlands and streams include Sections 404 and 401 of the Clean Water Act (United States Code, Title 33, Chapter 1344 [33 USC 1344]). No wetlands will be impacted by this project. However, temporary disturbance to waters of the United States (streams) could occur with this project; therefore, the project will require review under the Clean Water Act. Washington State laws and programs designed to control the loss of wetland acreage and Waters of the State include the State Environmental Policy Act (SEPA), the State Hydraulic Code (WAC 220-110), and the Washington State Water Pollution Control Act (RCW 90.48). The City of Sultan Municipal Code (SMC) defines Critical Areas regulations (SMC, Chapter 17.10) and specifies wetland and stream buffer widths as well as allowed activities in critical areas/buffers in its jurisdiction. Federal, state, and city regulations may also require review of projects that may impact critical areas and/or buffers (temporary or permanent impacts).

Federal Species Regulations

Federal laws regulating habitat and species include Sections 404 and 401 of the Clean Water Act (USC Title 33, Chapter 1344 [33 USC 1344]), the Endangered Species Act (ESA) (16 USC 1531), the Bald and Golden Eagle Protection Act (16 USC 668–668c), and the Migratory Bird Treaty Act (16 USC 703–712).

Shoreline Regulations

The Sultan River is a Shoreline of the State and is therefore subject to Shoreline Management Act regulations (RCW 90.58.065) and regulations per the City's Shoreline Master Program (SMP), Chapter 17.20. All proposed modifications or development in shoreline jurisdiction must be designed to achieve no net loss of ecological functions as defined in WAC 173-26-201(3)(d)(i)(C). The City's SMP also outlines specific areas identified for restoration opportunities in Chapter 8 of the SMP.

City of Sultan Municipal Code

Shoreline Master Program

Per the SMC 17.20, the Sultan River is a Type I stream and a Shoreline of the State. The associated shoreline jurisdiction applies to all lands within 200 feet from the OHWM of the river, a portion of the associated 100-year floodplain, and all wetlands in the 100-year floodplain. Within the study area, the shoreline designation is "natural" and "urban conservancy." The purpose of the natural designation is *to protect shorelines that remain relatively free of human influence or that include intact or minimal degraded shoreline functions that cannot support human use*. The purpose of the urban conservancy designation is *to protect and restore the ecological functions of open space, floodplain, and other sensitive lands where they exist in urban and developed areas* (Sultan 2019).

Critical Areas Ordinance

Critical areas are defined as the following in the City's Critical Areas Ordinance (CAO): critical aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and wetlands (SMC 17.10.320).

Type S Streams, including the Sultan River are required to have a 150-foot buffer. Type F streams, including the previously constructed Side Channel 1 are required to have a 150-foot buffer, based on the classification as a Type F (2) stream, which is used by fish for spawning, rearing, or migration (SMC 17.10.100).

Wetland buffers are determined based on the 2014 Washington State Department of Ecology Wetland Rating System for Western Washington, per SMC 17.10.105. Buffer widths vary based on Wetland Category (I through IV), habitat score, and implementation of mitigation measures.

STUDY METHODS AND RESULTS

Herrera conducted a review of available information about the study area prior to a site visit. The following sections describe the research methods and field protocols for the wetland and stream evaluations. Appendix A includes more information about the methodology used in the wetland delineation performed for this project.

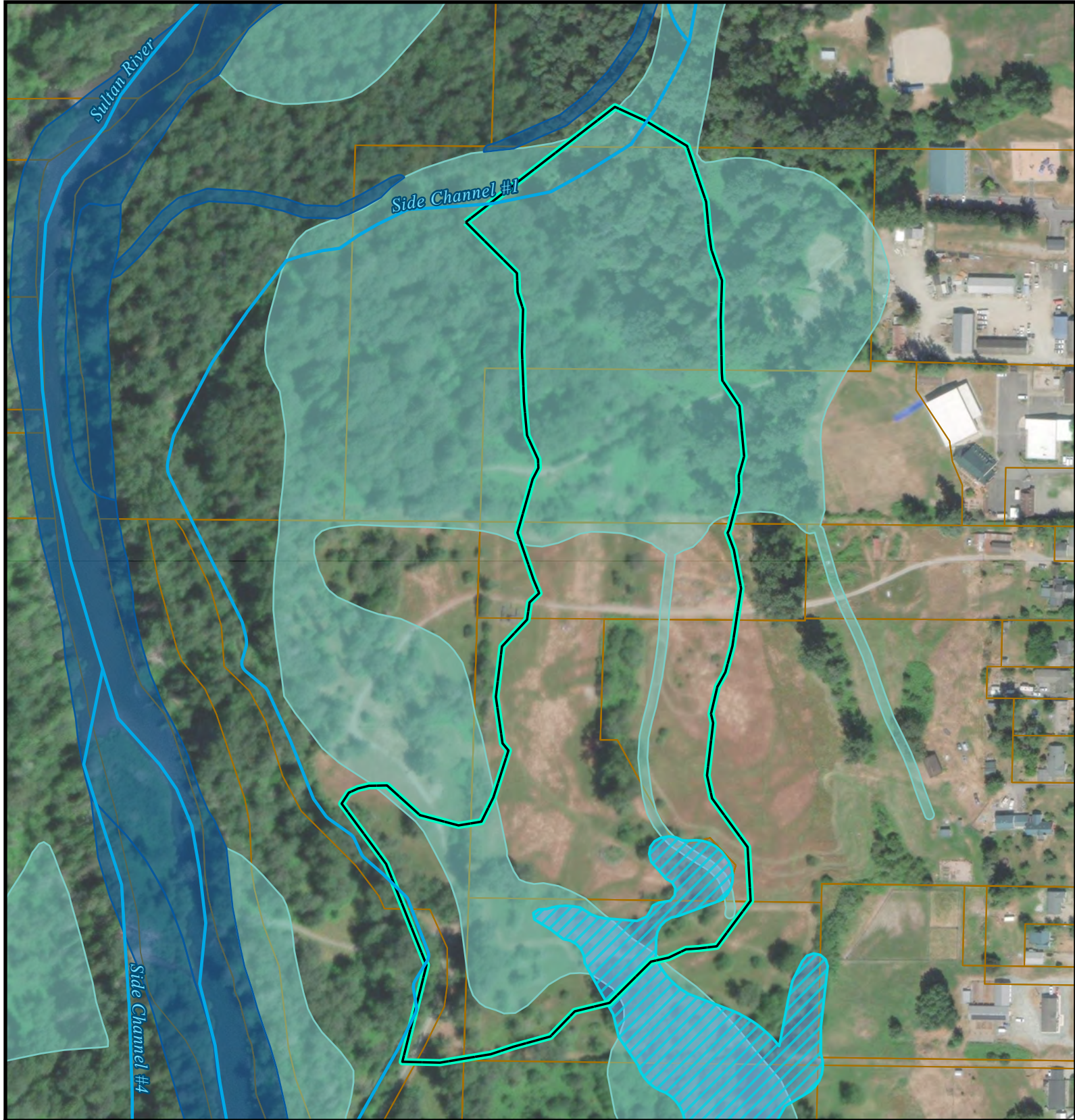
Analysis of Available Information

A literature review was performed to determine the historical and current presence of wetlands and streams in and near the study area. Sources of information included:

- National Wetlands Inventory map of wetland areas in the study area (USFWS 2023b)
- National Flood Hazard Layer Viewer (FEMA 2023)
- Washington State priority habitat and species (PHS) data (WDFW 2023b)
- Washington State Natural Heritage data (WDNR 2023)
- U.S. Department of Agriculture, Natural Resources Conservation Service soil survey information (NRCS 2023b, 2023c, and 2023d)
- Climate data and precipitation data (NRCS 2023a)

Publicly Available Mapped Wetlands and Streams

The National Wetlands Inventory (NWI) shows a large palustrine forested/scrub-shrub wetland within the study area, including two linear fingers that are historical side channels, located east of the study area. The Sultan River is mapped west of the study area as an upper perennial riverine system. Winters Creek is also mapped north of the study area (Figure 2).



Legend

- | | |
|--|--|
| NWI Wetlands |  Rivers and Streams |
|  Freshwater Forested/Shrub Wetland |  Study Area |
|  Riverine |  Parcels |
|  Snohomish County Wetlands | |

Figure 2.
Previously Mapped Wetlands and Streams in the Vicinity of the Side Channel 1 Extension Project.



USFWS, Snohomish County, Esri Imagery (2022)

Precipitation Data

As discussed in detail in Appendix A, an important part of wetland delineation work is understanding antecedent precipitation conditions that may affect wetland hydrology indicators in the field. Historical average precipitation measurements were based on data collected at the STARTUP 1 E precipitation gaging station, which is located approximately 4 miles east of the study area (Latitude 47.8663 degrees, Longitude -121.7175 degrees) for the period of record 1991 to 2021.

Precipitation was evaluated for a 3-month period prior to each field investigation, which occurred on July 28, 2021; August 24, 2021; December 15, 2021; and January 27, 2022. The resultant precipitation conditions in the 3 months prior to the July 2021 site visit were drier than normal, in the 3 months prior to the December 2021 visit were wetter than normal, and in the 3 months prior to both the August 2021 and January 2022 visits were normal (Table 1).

During one of the days of the fieldwork, and in the 10 days leading up to the each of the fieldwork dates, some precipitation was recorded (Table 2) (NRCS 2023a).

Table 1. Evaluation of Normal Precipitation for the Period Preceding Field Investigations.

Prior Month	WETS Rainfall Percentile (inch)		Measured Rainfall (inch)	Condition: Dry, Wet, Normal
	30th	70th		
May 2021	3.52	5.58	3.56	Normal
June 2021	2.78	4.71	3.11	Normal
July 2021	0.83	1.81	0.15	Dry
August 2021	0.77	2.08	0.98	Normal
September 2021	2.25	4.35	4.31	Normal
October 2021	5.25	8.47	8.45	Normal
November 2021	7.93	11.06	13.60	Wet
December 2021	6.89	9.45	5.07	Dry
January 2022	6.90	10.40	9.64	Normal
Date of Field Investigation		Evaluation of Normal Precipitation		
July 28, 2021		Drier than normal		
August 24, 2021		Normal		
December 15, 2021		Wetter than normal		
January 27, 2022		Normal		

Source: WETS Station: STARTUP 1 E, 1991–2021; NRCS 2023a.

Table 2. Precipitation in the 10-day Period Prior to Field Investigations.

Parameter	July 28, 2021	August 24, 2021	December 15, 2021	January 27, 2022
Total Accumulation for 10-Day Period	0.06 inch	0.08 inch	3.17 inches	2.02 inches
Day of Field Work	0.00 inch	0.00 inch	0.06 inch	0.00 inch

Source: WETS Station: STARTUP 1 E, 1991–2021; NRCS 2022a.

Mapped Soils

Two types of soil are mapped within the study area (NRCS 2023b, 2023c, and 2023d) (Appendix D) and described below.

Pilchuck Loamy Sand

Pilchuck loamy sand (soil unit 50) is mapped within forested portions of the study area, mainly in the north and west parts of the study area (NRCS 2023b, 2023c). Pilchuck loamy sand is found in floodplain areas. This soil consists of loamy sand from 0 to 31 inches depth below the ground surface, fine sand from 31 to 50 inches depth, and gravelly sand from 50 to 60 inches depth. Pilchuck soil is somewhat excessively drained with a water table between 24 and 48 inches depth below the ground surface and is considered non-hydric. Approximately 5 percent of this soil unit includes inclusions of Puget soil, which is a hydric soil typically found in floodplains (NRCS 2023d).

Sultan Silt Loam

Sultan silt loam (soil unit 66) is mapped throughout most of the study area and is found in floodplains (NRCS 2023b, 2023c). This soil consists of ashy silt loam from the ground surface to 12 inches depth, silty clay loam from 12 to 42 inches depth, and stratified sand to silt loam from 42 to 60 inches depth. Sultan silt loam is moderately well drained with a water table between 24 and 48 inches depth below the ground surface. This soil is listed as non-hydric. Approximately 5 percent of this soil unit includes inclusions of Puget soil, which is a hydric soil typically found in floodplains (NRCS 2023d).

Wetlands

Herrera conducted the wetland delineation in accordance with the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010), which is consistent with the *1987 Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). The methods in these guidance manuals use a three-parameter approach for identifying and delineating wetlands and rely on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. The detailed methods for evaluating these three parameters and for performing the wetland delineation are described in Appendix A.

Test plots were established to document conditions in wetlands and in adjacent uplands. For each test plot, data on dominant plant species, soil conditions, and evidence of hydrologic conditions were

recorded on wetland determination data forms (Appendix B) and Ecology wetland rating forms (Appendix C). Test plots were dug and recorded for each of the delineated wetlands in the study area.

Wetlands observed within the study area were classified according to the U.S. Fish and Wildlife Service classification system (FGDC 2013). This system is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate. The wetlands were also classified according to the hydrogeomorphic (HGM) system, which is based on an evaluation of attributes such as the position of the wetland within the surrounding landscape, the source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993).

Wetland Delineation

Wetland delineations were conducted by Herrera biologists Tina Mirabile and Danielle Rapoza according to the methodology described in Appendix A. Delineations were conducted during four separate site visits on July 28, 2021; August 24, 2021; December 15, 2021; and January 27, 2022. Herrera biologists determined the July and August investigation took place during the growing season (as defined in Appendix A) because newly emerged herbaceous vegetation was growing during these site visits. The December and January site visits were conducted in the non-growing season.

Six wetlands were delineated in the study area: Wetlands 2, 3, 4/5, 6, 7, and 8 (Figure 3; Table 3). Representative photographs of the wetlands are included in the [Vegetation](#), [Soils](#), and [Hydrology](#) subsections of this Wetland Delineation section. Sample plots within the wetlands exhibited similar soil and vegetation conditions.

Table 3. Summary of Wetlands Delineated in the Study Area for the Sultan River Side Channel 1 Extension.

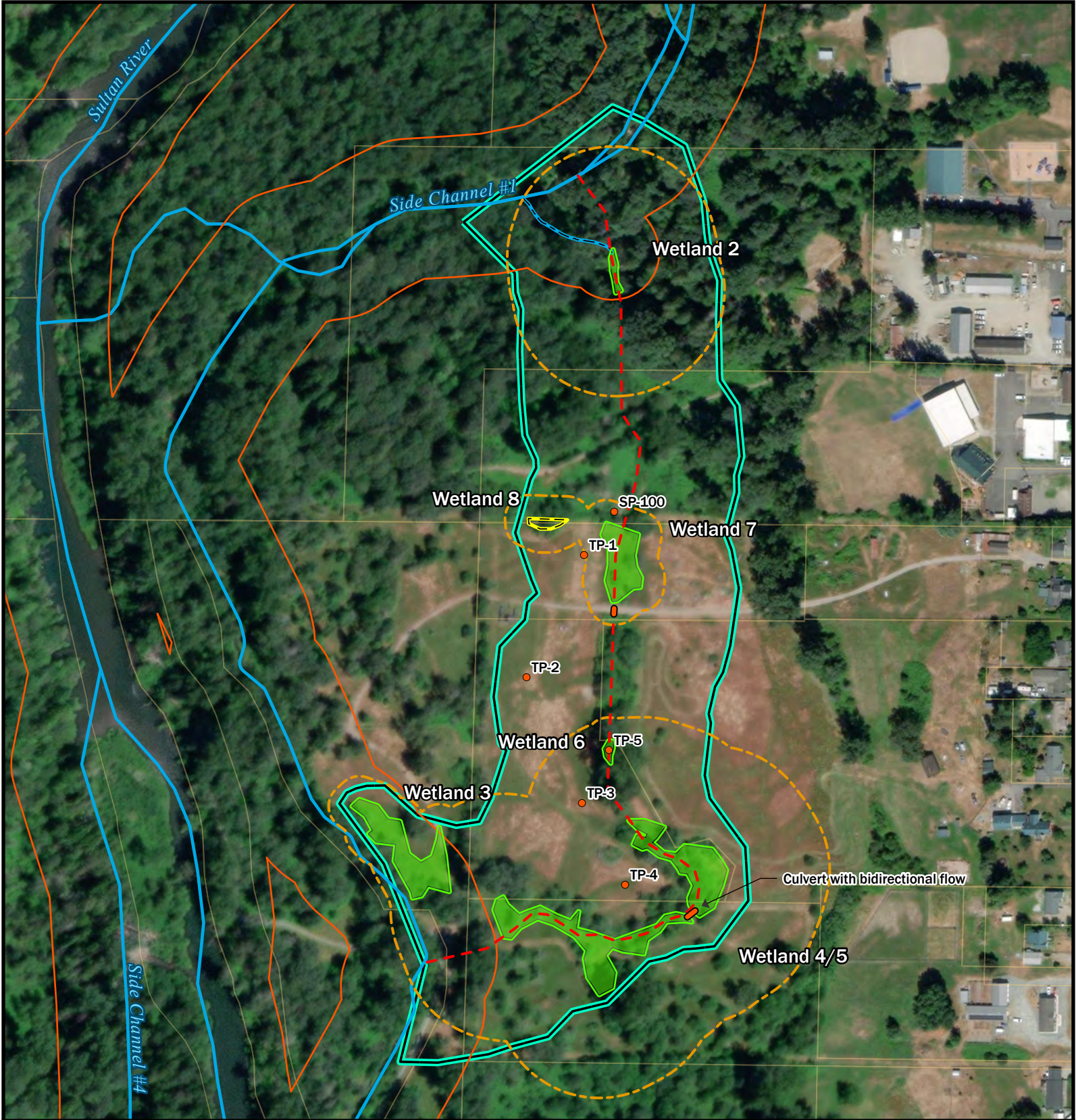
Wetland Name	Wetland Size (square feet)	USFWS Classification ^a	Hydrogeomorphic Classification ^b	Ecology Rating Category (2014) ^c
2	752	PEM	Riverine	III
3	13,389	PEM	Slope	IV
4/5	29,766	PFO, PSS, PEM	Depressional	III
6	554	PEM	Depressional	IV
7	8,955	PEM	Depressional	IV
8	1,527	PEM	Depressional	IV

^a U.S. Fish and Wildlife Service classification is based on FGDC (2013). Vegetation communities include palustrine emergent (PEM), palustrine scrub-shrub (PSS), and palustrine forested (PFO).

^b Hydrogeomorphic classification is based on Brinson (1993).

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

Representative conditions are described in the subsections below. Wetlands located in pasture areas exhibited similar vegetation and soil characteristics represented by test pit 5 (TP-5).



Legend

- | | |
|---|---|
| — Study Area | — Rivers and Streams |
| • Test Pits | - - - Approximate Stream A |
| Delineated Wetland Boundary | - - - Historic Channel |
| Estimated Wetland Boundary | Culvert |
| Wetland Buffer | Parcels |
| Stream Buffer | |

Figure 3.
Wetlands, Streams, and Buffers in the Study Area, Sultan River Side Channel 1 Extension Project.



0 125 250 500
Feet



Snohomish County, Esri Imagery (2022)

K:\Projects\Y2020\20-07466-001\Pro\Sultan_River_Side_Channel_Inlet\Sultan_River_Side_Channel_Inlet.aprx

Vegetation

Wetland 2 is a palustrine emergent (PEM) wetland that contains creeping buttercup (*Ranunculus repens*) and speedwell (*Veronica* spp.). A large area of the wetland surface was unvegetated bare ground/mud.

Wetlands 3, 6, 7, and 8 contain a PEM plant community that is grazed by cattle. The dominant vegetation species are primarily introduced, naturalized pasture species including Kentucky bluegrass (*Poa pratensis*), colonial bentgrass (*Agrostis capallaris*), dovesfoot geranium (*Geranium molle*), red clover (*Trifolium pratense*), creeping buttercup (*Ranunculus repens*), and Himalayan blackberry (*Rubus armenicus*). Dominant native vegetation includes soft rush (*Juncus effusus*).

Wetland 4/5 contains PEM, palustrine scrub-shrub (PSS), and palustrine forested (PFO) plant communities. Dominant species include paper birch (*Betula papyrifera*), native willow species (*Salix* spp.) red osier dogwood (*Cornus sericea*), soft rush, and slough sedge (*Carex obnupta*). Some nonnative and invasive vegetation was present including English hawthorn (*Crataegus monogyna*), Himalayan blackberry, reed canarygrass (*Phalaris arundinacea*), and creeping buttercup.



Vegetation in Wetland 2 (top left), Wetland 4/5 (top right), Wetland 3 (bottom left), and Wetland 6 (bottom right)

Soils

At TP-5, in Wetland 6, soils were examined to a depth of 12 inches below the ground surface and exhibited hydric characteristics. From the surface to 12 inches depth, soils were very dark grayish brown (10YR 3/2) with dark yellowish brown (10YR 4/4 or 10YR 3/4) redoximorphic concentrations. This profile meets the criteria for Redox Dark Surface (F6). Soils observed in other wetlands within the study area were similar to those in TP-5 but were not officially documented.



Wetland 2 soil pit (left) and representative soils (dry condition) in Wetlands 3, 4/5, 6, 7, and 8 (right).

Hydrology

Wetland 2 is a riverine wetland located within the historical side channel and at the southern end of Stream A, approximately 200 feet south of Side Channel 1. The primary source of hydrology to this wetland is surface water from Stream A and seasonal overbank flooding from Side Channel 1 and the Sultan River. Wetland 2 formed due to lack of regular flow through the historical side channel, allowing water to pond and wetland vegetation to colonize. South of Wetland 2, the historical side channel lacks regular flow, as is evidenced by lack of recent scouring in the channel and based on observations in December 2021, following wetter than normal precipitation in the preceding 3 months.

Wetland 3 is a slope wetland located at the southern end of the study area near the outlet of the historical side channel east of Side Channel 1. Regular overbank flooding does not influence the wetland, though larger floods may contribute water infrequently. Wetland 3 is located on a slight slope (less than 1 percent). Water moves from east to west across the wetland. The primary source of hydrology to Wetland 3 is from precipitation and groundwater. The wetland is seasonally saturated.

Wetlands 4/5, 6, 7, and 8 are depressional wetlands also located within a pasture in the southern portion of the study area. Groundwater and precipitation are the primary sources of hydrology to these wetlands. Wetlands 6 and 7 and the majority of Wetland 4/5 are located within the historical side channel, however microtopography within the channel itself prevents a direct, regular connection to Side Channel 1. A culvert with bi-directional flow connects two portions of Wetland 4/5. A culvert is located at the southern

end (downgradient) of Wetland 7, however the inlet is situated above the wetland. Wetland 8 is located on the fence line between the park property and private (pasture) property and slopes slightly in the direction of the historical side channel.

Some ponding was observed in these depressional wetlands during the December 15, 2021, site visit after several substantial flooding events had occurred up to that point in the wet season. All of the delineated wetlands, with the exception of Wetland 4/5, did not have surface water and were dry at the time of the August 24, 2021, site visit. Oxidized rhizospheres along living roots were the primary hydrology indicator observed during the August delineation. Ponded water was observed in areas of Wetland 4/5 during all four site visits. In TP-5 during the December 2021 site visit, saturation was observed at a depth of 9 inches below the ground surface and the water table was located at 11 inches below the ground surface.



Surface water observed in Wetland 4/5 on August 24, 2021 (left). Hydrology observed in Wetland 6 during December 15, 2021 site visit (right).

Wetland Rating and Functional Assessment

Wetland functions were assessed using *Washington State Wetland Rating System for Western Washington: 2014 Update*, referred to hereafter as the Ecology rating system (Hruby 2014). This system generates a qualitative functional rating (high, moderate, or low) for each of three functions (water quality, hydrology, and habitat) provided by wetlands. The Ecology rating system is required by SMC 17.10.320. It categorizes wetlands according to specific attributes such as rarity, sensitivity to disturbance, hydrologic, water quality, and habitat functions, and special characteristics (e.g., mature forested wetland, estuarine, bog). The total score for all functions determines the wetland rating. The rating system consists of four categories, with Category I wetlands exhibiting outstanding functions and/or special characteristics and Category IV wetlands exhibiting minimal attributes and functions. The rating categories are used to identify permitted uses in a wetland and its buffer, to determine the width of buffers needed to protect a wetland from adjacent development, and to identify the mitigation ratios required to compensate for potential impacts on wetlands.

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

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

Table 4 provides a summary of the function scores, the total wetland score, and the associated rating (category) for all of the delineated wetlands based on the Ecology rating system (Hruby 2014).

Table 4. Individual Function Scores for Wetlands Delineated in the Study Area.											
Wetland Name	Water Quality Functions Rating^a			Hydrologic Functions Rating^a			Habitat Functions Rating^a			Total Score^b	Ecology Rating Category
	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value	Site Potential	Landscape Potential	Value		
2	L	H	L	L	M	H	L	H	H	18	III
3	L	M	L	L	L	H	L	H	M	15	IV
4/5	M	M	L	M	M	H	L	H	M	18	III
6	L	M	L	M	L	H	L	H	L	15	IV
7	L	M	L	M	L	H	L	H	L	15	IV
8	L	M	L	M	L	H	L	H	L	15	IV

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

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

Water Quality

Wetland 2 has a low potential to provide water quality functions on site due to a lack of surface depressions and structure of vegetation, which can slow floodwater and trap pollutants. Wetland 4/5 has a moderate potential to provide water quality functions due to seasonal ponding. Wetlands 3, 6, 7, and 8 have a low potential to improve water quality due to vegetation grazing and limited area of seasonal ponding. The large contributing drainage basin of Wetland 2 encompasses many land uses and therefore corresponds to a high potential for the wetland to provide water quality functions on the landscape scale. Land use in the immediate vicinity of Wetlands 3, 4/5, 6, 7, and 8 corresponds to some potential for water quality benefits on the landscape scale. There are no water quality improvement plans or Clean Water Act Section 303(d) listings for impaired waters in the vicinity of any of the study area wetlands (Ecology 2023b).

Hydrology

Wetlands 2 and 3 have low potential to provide hydrologic functions on site due to their lack of dense and/or ungrazed vegetation, which can slow flood flow velocities. Wetland 2 also has a relatively small area of overbank flood storage compared to its large contributing drainage basin. Agricultural land use in the contributing drainage basins of Wetlands 4/5, 6, 7, and 8 corresponds to moderate potential to support hydrologic functions on site. The Sultan SMP identifies the study area as a frequently flooded site, therefore, the hydrologic functions provided by the site are valuable to society.

Habitat

All wetlands in the study area have a low potential to provide habitat functions on site due to the limited number of plant classes (except Wetland 4/5), low plant diversity, few hydroperiods, and lack of special habitat features such as downed wood, overhanging plants, and low amount of invasive vegetation cover. Wetland 4/5 has PEM, PSS, and PFO communities and therefore has a moderate potential to provide habitat functions on site. However, all of the delineated wetlands have a high potential to support habitat functions on a landscape scale due to the relatively large area of undisturbed habitat accessible to wildlife in the region. There are several WDFW priority habitats associated with Side Channel 1 which are near Wetlands 2, 3, and 4/5, making habitat provided by these wetlands slightly more valuable to society.

Streams

Streams and stream buffers are regulated by the City under its critical areas code (SMC 17.10.100) and through the Sultan Shoreline Master Program.

The OHWMs of streams within the study area were delineated using the definition provided in the WAC, Section 222-16-010. According to this definition, the OHWM of streams is “that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation.” In addition, methods in the publication *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016) were applied. The detailed methods for evaluating field conditions to perform the OHWM delineation are described in Appendix A.

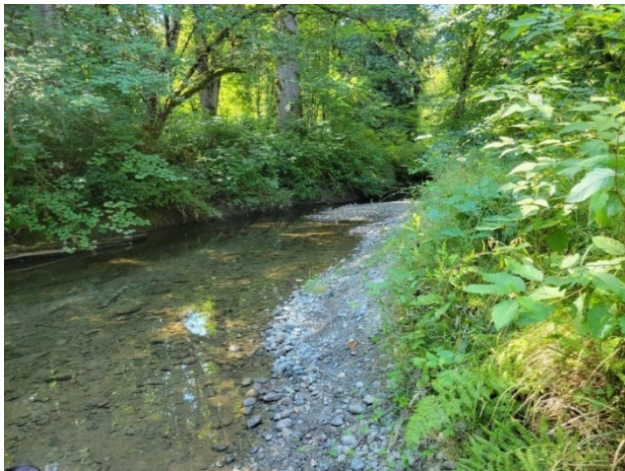
Ordinary High Water Mark Delineation

Herrera delineated the OHWM of two streams within the study area, Side Channel 1 and Stream A (Figure 3). Based on the field investigations, Side Channel 1 was observed to have perennial flow and is a Type F (fish bearing) stream.

For this assessment, onsite OHWM indicators were examined along Side Channel 1 in the vicinity of the proposed Side Channel 1 Extension connection points at the north and south ends of the study area. Indicators frequently used to define the OHWM of Side Channel 1 during the field visits included:

- A scour line indicated by clean gravel and lack of leaf litter
- Racked debris including dead aquatic vegetation hung up on trees and shrubs
- Sediment on tree bark and moss
- A topographic bench located at the top of bank

Photos of Side Channel 1 within the study area are provided below.



Side Channel 1 in the northern portion of the study area near the inlet to the historical channel (left). Side Channel 1 in the southern portion of the study area near the outlet to historical channel (right).

OHWM indicators were also evaluated in the historical side channel and in Stream A, an alternative inlet to the historical channel, between the confluence with Side Channel 1 and Wetland 2 (indicated by the photos below). Within Stream A, scour, racked debris, and a line of clean substrate indicated the OHWM. Within the historical side channel, moss and small forbs were observed growing in the channel bottom, indicating that the channel receives infrequent flow/flooding. Cobble embedded in silt and sand was observed in the bottom of the channel.



Stream A between Side Channel 1 and Wetland 2 (left). Historical side channel south of Wetland 2 (right).

South of Wetland 2 the historical side channel is fully vegetated with Himalayan blackberry. Steep banks indicated the location of the historical channel, however no recent or discernable OHWM indicators were present south of Wetland 2. Prior to the site visit to conduct OHWM delineations, the District cleared the channel of blackberry for access as shown in the photo to the right. The segment of the historical channel located in the southern half of the study area becomes undefined as there is little topography to indicate the direction of flow. This region becomes flat and gradually slopes to the south.



Probable location of historical channel as it becomes undefined, mid-reach.

Stream Classification

The City of Sultan regulates streams within its jurisdiction as environmentally critical areas (SMC 17.10.100). In accordance with SMC, streams in the study area were classified using the Washington Department of Natural Resources (WDNR) forest practices stream typing system (WDNR 2022, SMC 17.10.100). There are five stream types described in SMC, which is consistent with the WDNR interim water typing system: Type S (1), Type F (2), Type F (3), Type Np (4), and Ns (Type 5). Type S waters are defined as waters inventoried as shorelines of the state under Chapter 90.58 RCW. Type F (2) waters are segments of natural waters that are not classified as Type S water and have a high fish, wildlife, or human use. Type F (3) waters are segments of natural waters that are not classified as Type S or Type F (2) waters and have moderate to slight fish, wildlife, and human use. Type Np (4) waters are all segments of natural waters within the bankfull width and defined channels that are perennial non-fish habitat streams. Type Ns (5) waters are all segments of natural waters that are not Type S, F, or Np waters. These are

seasonal, non-fish habitat streams in which surface flow is not present for at least some portion of the year and that are not located downstream from any stream reach that is Type S, F, or Np.

Side Channel 1 is connected to the Sultan River with documented fish presence, therefore, Side Channel 1 is classified as a Type F (2) stream. Stream A is a seasonally flowing tributary to Side Channel 1, approximately 200 feet long, terminating at Wetland 2. Therefore, Stream A meets the criteria for a Type F (3) stream.

Wetland and Stream Buffers

Stream buffer widths included in Table 5 are defined in SMC 17.10.150. Wetland buffer widths included in Table 5 are defined in SMC 17.10.105 and are based on the wetland rating and habitat score presented in Table 4. The City allows smaller than these standard buffer widths provided that all minimization measures in SMC 17.10.105 Table 2 are implemented. The proposed project is a restoration project designed to increase salmon, floodplain, and riparian habitat. For simplicity, the standard buffer widths for all wetlands were applied.

Table 5. Wetland and Stream Ratings and Required Buffer Widths for the Sultan River Side Channel 1 Extension Project.

Resource Name	Stream Type or Wetland Category	Wetland Habitat Score	City of Sultan Standard Buffer Width ^a (feet)	City of Sultan Buffer Width with Minimization ^a (feet)
Side Channel 1	Type F (2)	NA	150	NA
Stream A	Type F (3)	NA	100	NA
Wetland 2	Category III	7	220	165
Wetland 3	Category IV	NA	50	40
Wetland 4/5	Category III	6	220	165
Wetland 6	Category IV	NA	50	40
Wetland 7	Category IV	NA	50	40
Wetland 8	Category IV	NA	50	40

^a Standard wetland buffer widths for Category III wetlands and above are based on wetland category and habitat score from SMC 17.10.105A.4 Table 3. SMC 17.10.105A Table 1 provides alternate buffer widths assuming all minimization measures in SMC 17.10.105 Table 2 are implemented.

Buffer conditions around Wetland 2, Stream A, and Side Channel 1 are primarily forested. Within forested areas, the plant community supports stream habitat functions, including shading of the stream channel, and bank integrity by means of root reinforcement. This forested area also helps reduce flooding and erosion within the floodway of the Sultan River and helps maintain the side channel network, which is crucial for aquatic species. The forest canopy and understory shrubs function to filter stormwater runoff from nearby developed land and provide wildlife habitat. Existing buffer vegetation in forested areas is generally dominated by a mix of native and nonnative species. Dominant species include western red cedar (*Thuja plicata*), bigleaf maple (*Acer macrophyllum*), black cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), vine maple (*Acer circinatum*), Pacific ninebark (*Physocarpus capitatus*), red osier

dogwood, snowberry (*Symphoricarpos albus*), salmonberry (*Rubus spectabilis*), and lady fern (*Athyrium filix-femina*). Common nonnative vegetation in buffers includes Himalayan blackberry, St. John's Wort (*Hypericum perforatum*), knapweed (*Centaurea* spp.), bird's foot trefoil (*Lotus corniculatus*), and herb Robert (*Geranium robertianum*).

Buffers surrounding other wetlands in the southern portion of the study area consist of upland pasture that is regularly grazed by one to five cows. Himalayan blackberry is prevalent in the buffers of these wetlands and along the historical side channel.

Fish and Wildlife Habitat Use

According to WDFW PHS data (WDFW 2023b), the study area is within the potential range for species or habitat occurrence of the western pond turtle (*Actinemys marmorata*). The western pond turtle is listed as an endangered species in Washington state. Western pond turtles may use open upland habitat in proximity to aquatic habitat such as marshes, ponds, sloughs, and small lakes for nesting (Nordstrom and Milner 1997). There is no known aquatic habitat that meets their requirements in the study area. However, a large wetland/historical river oxbow is located approximately 1,000 feet northeast of the study area in Osprey Park that likely provides suitable habitat for the western pond turtle.

Based on the WDFW and Northwest Indian Fisheries Commission (NWIFC) combined data set there is documented fish habitat for many salmonids in the Sultan River and Side Channel 1 (Table 6) (WDFW and NWIFC 2023). Due to the seasonal connection with Side Channel 1, salmonids are presumed to be occasionally present in Stream A, although none are mapped by WDFW and NWIFC (2023).

Other priority species likely to be found in the project vicinity include great blue heron (*Ardea Herodias*) and bald eagle (*Haliaeetus leucocephalus*). Bald eagles and their nests are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.) and are protected in the state of Washington (WAC 220-610-100). During the field visits, Herrera biologists observed common raptors, waterfowl, and songbirds within the study area. Species included: Cooper's hawk (*Accipiter cooperii*), mallard (*Anas platyrhynchos*), northern flicker (*Colaptes auratus*), American crow (*Corvus brachyrhynchos*), Pacific slope flycatcher (*Empidonax difficilis*), song sparrow (*Melospiza melodia*), spotted towhee (*Pipilo maculatus*), American robin (*Turdus migratorius*), Bewick's wren (*Thryomanes bewickii*), dark-eye junco (*Junco hyemalis*), black-capped chickadee (*Poecile atricapillus*), red-breasted nuthatch (*Sitta canadensis*), and Anna's hummingbird (*Calypte anna*).

In addition to ESA-listed fish described above, the U.S. Fish and Wildlife Service (USFWS) maps two threatened birds as possibly occurring in the study area: marbled murrelet (*Brachyramphus marmoratus*) and yellow-billed cuckoo (*Coccyzus americanus*) (USFWS 2023a). Gray wolf (*Canis lupus*) and North American wolverine (*Gulo luscus*) are also mapped as potentially occurring in the study area by USFWS and WDFW (USFWS 2023a, WDFW 2023a). There is no designated critical habitat in the area, and the preferred or necessary habitat is not present for any of the above species in the project vicinity. Aside from the listed fish species usage of Side Channel 1 and Stream A mentioned above, there are no ESA-listed species likely to occur in the study area.

Table 6. Documented Fish Use in Study Area.

Fish Species/Run	Distribution/Use Type^a	Federal Listing Status
Summer Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	Documented presence in Sultan River	Threatened
Fall Chinook salmon	Documented spawning in Sultan River	
Coho salmon (<i>O. kisutch</i>)	Documented rearing in Sultan River, documented presence in Side Channel 1	None
Fall chum salmon (<i>O. keta</i>)	Documented spawning in Sultan River, gradient accessible presence in Side Channel 1	None
Pink salmon (<i>O. gorbuscha</i>)	Documented spawning in Sultan River, gradient accessible presence in Side Channel 1	None
Summer steelhead trout (<i>O. mykiss</i>)	Documented in Sultan River	Threatened
Winter steelhead trout (<i>O. mykiss</i>)	Documented spawning in Sultan River, documented presence in Side Channel 1	
Rainbow trout (<i>O. mykiss</i>)	Documented in Sultan River	None
Coastal cutthroat trout (<i>O. clarkii</i>)	Documented in Sultan River	None
Bull trout (<i>Salvelinus confluentus</i>)	Documented rearing in Sultan River, presumed presence in Side Channel 1	Threatened

^a WDFW and NWIFC 2023

Frequently Flooded Areas

The FEMA regulatory floodway of the Sultan River spans the entire study area. The 100-year floodplain extends eastward over a large portion of the Sultan city limits.

PROPOSED PROJECT

Project Purpose and Description

The proposed project is a river restoration project that will create an additional 1,908 linear feet of side channel habitat, extending Side Channel 1, which was constructed in 2012 by the District for fish habitat. Restoration activities and in-stream fish and wildlife enhancement are allowed activities in wetlands, streams, and buffers per the City's Code (SMC 17.10.160A). Research has shown that restoring side channels for rearing habitat and refuge during flooding may be one of the most important ways to increase Chinook salmon populations (Hall et al. 2018). The proposed side channel extension is located within the Sultan River floodway, which will provide important refuge for Chinook salmon and other fish species during flooding events with large woody material and a meandering channel. Additionally, native riparian vegetation will be planted adjacent to the channel in a 100-foot-wide easement on private land with an average of 35 feet of enhanced and protected riparian buffer on both sides of the new channel. The side channel extension will cross through existing grazed pasture where vegetation is predominantly herbaceous. In this converted pasture area, native trees will be installed at 12 feet on center and shrubs will be installed at 5 feet on center. Within existing forested areas (in the north half of the project corridor), invasive species will be removed, and native trees will be added at 18 feet on center and shrubs will be added at 10 feet on center. Due to existing vegetation growth in the northern half of the project corridor, wider spacing for new plantings is appropriate and more conifers and shade tolerant vegetation species were selected for the planting plan.

The project is designed within and adjacent to a historical side channel. Except for the northern-most extent, the historical channel no longer has regular flow from Side Channel 1; it receives inflow from Side Channel 1 and/or the Sultan River only during larger flooding events. As a result, five depressional or slope wetlands have formed within the historical channel (Wetlands 3/4, 5, 6, 7, and 8). Wetland 2 is located at the end of Stream A, near the connection point of the historical side channel to Side Channel 1, where it receives more frequent flow from Side Channel 1 through Stream A, such that the wetland is considered a riverine wetland. To preserve the six wetlands that have developed in the historical side channel, the proposed side channel extension was designed to meander around Wetlands 3/4, 5, 6, 7, and 8.

The proposed restoration project includes the following actions:

- Create 1,908 linear feet of side channel that will connect to existing Side Channel 1 by excavating a channel within and around a historical side channel, resulting in approximately 38,153 square feet of new permanently flowing instream habitat. The channel will be approximately 20 feet wide at the base and 22 to 33 feet across the top of bank. All exposed soils within the project corridor (above the ordinary high water mark) shall be mulched with at least 4 inches of hog fuel or woodchip mulch, or be seeded.

- Create a ford to allow an existing gravel driveway to cross the new side channel on tax parcel 28083100402300. The ford will consist of 4- to 8-inch cobbles placed in the proposed streambed in a total area of 830 square feet.
- Place large woody material in the new channel, as depicted in the site plan drawings in Appendix E.
- Remove nonnative/invasive species within 50 feet of the centerline of the new channel.
- Enhance riparian vegetation around the new channel by planting native trees and shrubs on both sides of the channel. Approximately 67,500 square feet of proposed forested riparian habitat within an existing pasture will be planted with trees and shrubs. Approximately 53,660 square feet of riparian understory plantings within existing forested areas will be planted with native trees spaced around existing native vegetation. Portions of Wetlands 2, 3, 4/5, 7, and 8 are located within 50 feet of the proposed side channel centerline, and therefore small sections of these wetlands will also be enhanced by planting 2,892 square feet with wetland scrub/shrub vegetation.
- Protect the Side Channel 1 Extension corridor with a 100-foot-wide easement for the length of the channel. Easements have already been established or are currently underway.

CRITICAL AREAS IMPACTS

Wetlands, Streams, and Buffer Impacts

The project is a fish enhancement project that will result in a net increase in fish and wildlife habitat and floodplain habitat. Direct wetland impacts were avoided by designing the proposed side channel around the existing wetlands within the study area. However, short-term, temporary impacts to Side Channel 1 and wetland buffers cannot be avoided to complete this project. Approximately 23,818 square feet of wetland buffer and stream buffer will be converted to instream habitat. This conversion will provide important salmon rearing habitat, floodplain refugia, and increased riparian function that is missing as compared to historical conditions. Additionally, portions of the remaining wetlands and buffers will be enhanced, in areas adjacent to the proposed channel for a total of 123,819 square feet of riparian restoration.

The project will result in short-term, temporary impacts to Side Channel 1 below the OHWM where the proposed side channel extension will connect to Side Channel 1 at the north and south ends of the project corridor. This will include 19 linear feet of existing channel modification at the north end of the project area and 18 linear feet of existing channel modification at the south end of the project area due to excavation activities to tie in the new side channel extension to the existing side channel dimensions. Construction/excavation within 100 feet of the OHWM of Side Channel 1 will be completed during the most restrictive fish window for this site, August 1 through 31, to reduce potential impacts to ESA-listed fish species. Most of the construction of the rest of the new side channel will occur in uplands.

At the north and south connection locations with Side Channel 1, temporary bulk bags will be used to isolate the work area from active flow in Side Channel 1, forming a low dam approximately 35 inches by 35 inches by 40 inches in size. Plain bottom bulk bags will be used, each filled with 1 cubic yard of gravel. Less than 50 bulk bags will be required. Depending on prevailing flow rates in Side Channel 1, fish seining and or electrofishing may be required to ensure that no fish are stranded within the isolated work areas. The temporary placement of the bulk bag isolation barriers will reduce the potential for fish presence within the project work areas.

Temporary impacts to wetland buffers and stream buffers within the work corridor from construction activities and equipment will be limited to less than a 50-foot-wide corridor around the proposed channel, within the boundaries established by high-visibility construction fencing. Any trees greater than 12 inches in diameter within the southern (pasture) portion of the property should be retained if feasible and protected with fencing or identified with flagging. If larger trees have to be felled to complete the project, they should be repurposed as large woody material in the new side channel.

The approximately 10,000-square-foot construction staging area will be located outside of wetlands and buffers, within existing pasture, and will be defined with a temporary high-visibility fence around the perimeter. All temporary disturbance areas within the 100-foot-wide easement bracketing the new side

channel length, but above the OHWM, will be sheet mulched or seeded and planted with native trees and shrubs. If any incidental vegetation disturbance occurs outside of the designated work corridor (as defined by the high-visibility fencing) or staging area, it will be restored in-kind to pre-construction conditions.

Shoreline Impacts

The entire Side Channel 1 Extension is located within shoreline jurisdiction (City of Sultan Shoreline Master Program), classified as natural and urban conservancy shoreline environments. The purpose of urban conservancy shoreline area is to “protect and restore ecological functions of open space, floodplain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses.” The purpose of natural designated shoreline areas is to “protect those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use. Restoration of degraded shoreline should be sought within this environment” (City of Sultan Shoreline Master Program, SMC Chapter 17.20).

The proposed project is consistent with the shoreline designations within the project corridor. All impacts will be temporary and short-term in nature and will result in an increase in shoreline habitat—more than 38,153 square feet of side channel habitat and 123,819 square feet of riparian enhancement.

Frequently Flooded Area Impacts

The project area is located within the Sultan River floodway. Therefore, all project activities will result in temporary impacts to the floodway. However, earth work will be limited to drier, summer months, when the risk of flooding is practically nonexistent. Construction near and below the ordinary high water mark along the two connection points with Side Channel 1 will be isolated with bulk bag dams to reduce sediment disturbance in Side Channel 1.

Overall, the project will remove up to 100,000 cubic yards of soil within the floodway, thereby increasing flood storage capacity within the floodway and increasing floodplain refugia for numerous fish species. This soil will be exported and stockpiled to another property owned by the District in Sultan, some of which may be in the fringes of the 100-year floodplain, but outside the floodway. The stockpiled material will be used by the District for other projects as needed. A gravel ford across the proposed side channel will be constructed coincident with the location of an existing gravel road near the center of the project corridor, to enable the property owner to drive vehicles and equipment across the channel. This will allow for continued, occasional access by the private property owner to an existing shop. The ford will have a footprint area of 830 square feet and require importing approximately 553 cubic yards of 4- to 8-inch cobbles. To ensure a balance of cut and fill within the Sultan River floodplain, at least 553 cubic yards of material removed from the proposed Side Channel 1 Extension will be removed to a non-floodway location.

RESTORATION APPROACH

Restoration Sequencing

The proposed project is a fish habitat restoration project that will result in long-term benefits to salmonids and floodplain habitat. However, temporary impacts to critical areas and their buffers are necessary to achieve the project. Additionally, conversion of 23,818 square feet of wetland/stream buffer to in-stream habitat will also be necessary to construct the Side Channel 1 Extension. Adding in-stream habitat within the floodway will provide different functions than wetland/stream buffers and no specific mitigation is proposed to offset this conversion. However, the riparian corridor surrounding the new Side Channel 1 Extension will be enhanced by removing invasive species and adding native woody vegetation, providing long-term similar or greater buffer functions than currently exist in the project corridor. The southern half of the project corridor is pasture with dense patches of Himalayan blackberry, which will be greatly improved with the vegetation enhancement and invasive species control.

Temporary impacts will be restored through a sequence of actions intended to maintain or improve ecological functions currently present at the site following project completion. The project design reflects all reasonable efforts to avoid, minimize, rectify, reduce, and compensate for impacts to critical areas and buffers in a manner that maintains or improves ecological functions.

Impact Avoidance

It is not possible to entirely avoid impacts to critical areas and buffers because the entire study area is located within the Sultan River floodway and most of the study area is located within wetland or stream buffers. However, during the design process, project engineers and biologists coordinated to select strategic locations for the proposed channel location to avoid impacts to critical areas and buffers to the maximum extent possible by implementing the following measures:

- Side Channel 1 Extension was designed to meander around all wetlands within the study area to avoid direct wetland impacts.
- The equipment staging location was designed outside of wetlands and wetland/stream buffers.
- All excess excavated soil from the channel construction will be removed from the floodway and stockpiled outside of the floodway (either within the 100-year floodplain or entirely outside the floodplain).
- Imported cobbles for the ford will be offset by removing a minimum of the same volume of soil from the floodway and 100-year floodplain (553 cubic yards) to avoid adding fill into the floodway.
- Project access will be via an existing gravel driveway off of First Street to avoid temporary construction access impacts. The channel will be constructed from the center extending northward and southward, constructing the channel from the center outward, in order to avoid additional vegetation impacts adjacent to the proposed channel.

Impact Minimization

Where possible, impacts to critical areas and buffers will be minimized via the following measures:

- Clearing and grading will be limited to the minimum extents necessary to construct the project, particularly near wetlands and where the Side Channel 1 Extension will tie into the existing Side Channel 1 at the north and south extents of the project area. Grading along OHWM at the north end of the Side Channel 1 connection will be limited to 19 linear feet (approximately 440 square feet) and grading along the OHWM at the south end of the Side Channel 1 connection will be 18 linear feet (approximately 165 square feet).
- Prior to clearing and grading activities, a temporary high-visibility fencing the entire disturbance limits/work corridor will be installed to prevent unintended encroachment by construction activities into areas not planned for impacts.
- Large trees near disturbance limits to be protected will be marked with flagging or fencing.
- All disturbed/exposed soils will be stabilized by seeding or mulching. All areas within the 100-foot-wide easement bracketing the new side channel length, but above the OHWM will be planted with native woody vegetation.
- Implementing a stormwater pollution prevention plan (SWPPP), inclusive of a temporary erosion and sediment control (TESC) plan and a spill prevention, control, and countermeasures (SPCC) plan during construction to prevent and minimize erosion and the transport of sediments and other pollutants into wetlands and streams.
- Construction above and below the OHWM and within 150 feet of Side Channel 1 will be conducted during the most restrictive fish window (August 1 through 31).
- All fueling and maintenance of construction equipment will occur in designated staging areas, and containment measures will be in place per the SPCC plan.
- All trees and woody vegetation on site that must be removed within the proposed channel corridor will be utilized on site as either large woody material for the engineered log structures or chipped up to be utilized as mulch around restoration plantings/soil stabilization.

Impact Rectification

Once construction is complete, temporary impacts to critical areas and buffers will be restored. This will include decompacting disturbed areas, stabilizing exposed soils with a seed mix or wood chip mulch, and planting native woody vegetation within the designated riparian planting corridor.

Impact Reduction over Time

The District will reduce the impacts of the project over time by monitoring the entire project corridor in Year 1. Temporary stream impact areas proposed for restoration along the north and south connection points with Side Channel 1 will be monitored in Years 2 and 3, as is typically required by the U.S. Army Corps of Engineers for restoration projects. This will include the temporary disturbance area along the OHWM of Side Channel 1 at the north and south connection points out to 150 feet perpendicular to Side Channel 1, which includes the temporary stream buffer impacts.

Impact Compensation

Temporary impacts to Side Channel 1 and its buffer will be restored on site through the re-establishment of native woody vegetation.

RESTORATION GOALS, OBJECTIVES AND PERFORMANCE STANDARDS

The following sections describe the goals, objectives, and performance standards for the project. This project will increase year-round habitat for salmonids, increase floodplain refugia, and restore floodplain functions within a portion of the Sultan River floodway that is partially degraded pasture.

Goals and Objectives

The overall project goal is to increase year-round salmonid rearing and spawning habitat within the Sultan River floodway. However, due to temporary stream and buffer impacts that cannot be avoided to achieve the overall project goal, temporary impacts to Side Channel 1 and its buffer will occur, necessitating restoration of these areas. Therefore, specific goals, objectives, and performance standards have been tailored to focus on temporary impact restoration associated with Side Channel 1 and its buffer. Other components of this project (Side Channel 1 Extension creation, ELs within Side Channel 1 Extension, and other riparian enhancements) are the key components to this fish habitat enhancement project but are not included in annual compensatory mitigation monitoring requirements, beyond the as-built reporting and Year 1 monitoring.

The goal of the restoration plan is to restore temporarily disturbed Side Channel 1 locations and associated stream buffer by: (1) grading the north and south Side Channel 1 Extension connection points with Side Channel 1 to achieve a “natural” side channel connection and (2) restoring or enhancing vegetation within the 150-foot buffer of Side Channel 1 within the disturbance boundaries at both the north and south Side Channel 1 Extension connection locations. The stream buffer restoration includes approximately 2,000 square feet of stream buffer at the north Side Channel 1 Extension connection location and 2,000 square feet of stream buffer at the south Side Channel 1 Extension connection location.

Performance Standards

Performance standards are outlined in Table 7 to achieve the goals and objectives of the restoration plan. Performance standards for the restoration plantings will be determined based on meeting standards for minimum survival; minimum cover of native woody vegetation; and maximum allowed cover of noxious plant species over 3 years. Class A, B, and C noxious weeds listed by the Snohomish County are recommended for control (Snohomish County 2023).

Table 7. Performance Standards for Native Vegetation Restoration Areas.

Performance Standard	Year 1 (2025)	Year 2 ^a (2026)	Year 3 ^a (2027)
Plant Survival Rate (percent) In Pasture (south half)	100 ^b	NA	NA
Plant Survival Rate (percent) in Forest (north half) ^c	100 ^b	90	90
Native Woody Cover (percent) In Pasture (south half)	NA	> 10	> 20
Native Woody Cover in Forest (north half) ^d	NA	NA	NA
Class A Noxious Weeds Designated for Control (percent)		0	
Class B and C Noxious Weeds (percent)	< 10	< 20	
Native Plant Species Diversity Within Vegetation Communities	Buffer/Floodplain: Minimum three native trees and four native shrubs shall be represented. Scrub-Shrub Wetlands: At least three native shrubs shall be represented.		

^a In Years 2 and 3, only temporary impact areas adjacent to the Side Channel 1 connection points at the north and south ends of the project corridor will be monitored (within 150 feet of the OWHM of Side Channel 1 at the north and south project ends).

^b Plant survival will be measured for Year 1 over the entire planting corridor. In subsequent years, survival will be measured only in forested areas (north half) in lieu of measuring woody cover, due to the difficulty with measuring woody cover within existing forest.

^c Plant survival in forest areas will be monitored in all 3 years in lieu of monitoring woody cover.

^d Woody cover will not be monitored within existing forest.

RESTORATION PLAN

The intent of the native vegetation plantings is to create/increase shade over the Side Channel 1 Extension, provide future large woody debris recruitment, increase floodwater interception, and increase floodplain stability. The dense plantings will increase shade to moderate temperatures on land and over water. The diversity of plant species represented within the planting zones will offer food and shelter to multiple wildlife species, such as birds, insects, reptiles, amphibians, and mammals – small (e.g., rodents) and large (e.g., deer, bear).

The success of the native vegetation plantings will be determined based on meeting the performance standards for minimum plant survival, minimum cover of native woody and herbaceous vegetation, minimum plant species diversity within desired vegetation communities, and the maximum for allowed cover of invasive and nonnative plant species over three growing seasons. Evaluation of native plant cover will include both installed and volunteer species. Invasive, nonnative plant species, listed on the most current version of the Snohomish County Noxious Weed List (2023), shall also be assessed to determine if the restoration area meets invasive, nonnative plant species cover standards. Absolute cover is defined as the areal cover created by plants for each stratum (shrub/tree, and/or herbaceous/emergent) present in each monitoring plot area or transect.

Native vegetation installation will occur within existing pasture area on site (in the south half of the project corridor, within the District’s 100-foot-wide easement), which will include planting within wetlands and buffers/floodplain in areas within 50 feet of the centerline of the new channel. These areas will be densely planted (shrubs 5 feet on center and trees 12 feet on center). Planting will also occur within forested buffer/floodplain (in the north half of the project corridor) at a lower density (10 feet on center) due to existing forest vegetation. Total planting area is estimated at 123,819 square feet, as outlined in Table 8.

The designated construction staging area (located outside of wetlands and buffers) will be restored to pre-disturbance conditions as a pasture with a grass seed mix.

Table 8. Native Vegetation Planting Plan.

Location	Planting Area	Estimated Area	Proposed Plant Community
Pasture Area (south half of project corridor)	Buffer/Floodplain	67,499 square feet	Riparian Forest Community with Tree and Shrub Plantings
Forested Area (north half of project corridor)	Buffer/floodplain	53,428 square feet	Riparian Forest Understory Tree and Shrub Plantings
Wetlands (located throughout corridor)	Wetland 2	681 square feet	Palustrine Scrub-Shrub Wetland
	Wetland 3	1,457 square feet	Palustrine Scrub-Shrub Wetland
	Wetland 4/5	267 square feet	Palustrine Scrub-Shrub Wetland
	Wetland 7	466 square feet	Palustrine Scrub-Shrub Wetland
	Wetland 8	21 square feet	Palustrine Scrub-Shrub Wetland
Total Planting Area:		123,819 square feet	

Proposed planting palettes were selected for each specific location (pasture, existing forest, wetlands) based on plant tolerances for each zone and enhancement needs for that location. Plants selected for pasture areas prefer sun or partial sun and are likely to create quick cover, with a mix of fast-growing deciduous trees and slow-growing conifers. Plants selected for understory planting within existing forest are shade tolerant and include primarily conifers. Plants proposed for wetland areas include shrubs tolerant of water level fluctuations, typical of seasonally inundated wetlands and floodplains. Planting palettes for each zone are included in Table 9, Table 10, and Table 11. Specific quantities of each species will be selected by the District, dependent on plant availability, but a minimum of four tree species and five shrub species must be selected for forest riparian areas and a minimum of four wetland shrub species must be selected for wetland enhancement areas. Substitutions may be allowed if approved by the biologist. All plants must be marked with bright-colored flagging to aid in preparation of the as-built report and completion of annual performance monitoring.

Table 9. Forest Riparian Planting List (pasture).		
Common Name	Scientific Name	On-Center Spacing (feet)
Trees ^a		
Douglas fir	<i>Pseudotsuga menziesii</i>	12
Sitka spruce	<i>Picea sitchensis</i>	
Big-leaf maple	<i>Acer macrophyllum</i>	
Black cottonwood	<i>Populus balsamifera</i>	
Paper birch	<i>Betula papyifera</i>	
Red alder	<i>Alnus rubra</i>	
Grand fir	<i>Abies grandis</i>	
Total Trees = 469 in an area of 67,499 square feet		
Shrubs ^b		
Oceanspray	<i>Holodiscus discolor</i>	5
Snowberry	<i>Symphoricarpos albus</i>	
Nootka rose	<i>Rosa nutkana</i>	
Red elderberry	<i>Sambucus racemosa</i>	
Indian plum	<i>Oemleria cerasiformis</i>	
Black hawthorn	<i>Crataegus douglasii</i>	
Thimbleberry	<i>Rubus parviflorus</i>	
Salmonberry	<i>Rubus spectabilis</i>	
Red flowering currant	<i>Ribes sanguineum</i>	
Vine maple	<i>Acer circinatum</i>	
Black raspberry	<i>Rubus leucodermis</i>	
Total Shrubs = 2,231 in an area of 67,499 square feet		

^a At least four tree species must be selected.

^b At least five shrub species must be selected.

Table 10. Forest Understory Riparian Planting List (existing forest).

Common Name	Scientific Name	On-Center Spacing (feet)
Trees ^a		
Douglas fir	<i>Pseudotsuga menziesii</i>	18
Sitka spruce	<i>Picea sitchensis</i>	
Big-leaf maple	<i>Acer macrophyllum</i>	
Western red-cedar	<i>Thuja plicata</i>	
Western hemlock	<i>Tsuga heterophylla</i>	
Grand fir	<i>Abies grandis</i>	
Total Trees = 164 in an area of 53,428 square feet		
Shrubs ^b		
Oceanspray	<i>Holodiscus discolor</i>	10
Snowberry	<i>Symphoricarpos albus</i>	
Nootka rose	<i>Rosa nutkana</i>	
Red elderberry	<i>Sambucus racemosa</i>	
Indian plum	<i>Oemleria cerasiformis</i>	
Vine maple	<i>Acer circinatum</i>	
Salal	<i>Gaultheria shallon</i>	
Beaked hazelnut	<i>Corylus cornuta</i>	
Total Shrubs = 369 in an area of 53,428 square feet		

^a At least four tree species must be selected.

^b At least five shrub species must be selected.

Table 11. Scrub-Shrub Wetland Planting List.

Common Name	Scientific Name	On-Center Spacing (feet)
Shrubs ^a		
Pacific ninebark	<i>Physocarpus capitatus</i>	5
Pacific willow	<i>Salix lucida</i> spp. <i>Lasiandra</i>	
Sitka willow	<i>Salix sitchensis</i>	
Red-osier dogwood	<i>Cornus sericea</i>	
Black twinberry	<i>Lonicera involucrata</i>	
Western crabapple	<i>Malus fusca</i>	
Total Shrubs = 116 in an area of 2,892 square feet		

^a At least four shrub species must be selected.

Performance Monitoring

Monitoring Schedule

Due to the nature of this project as a fish enhancement/stream restoration project, only 3 years of monitoring will be required for temporary impact areas above and below the OHWM of Side Channel 1 and its associated 150-foot buffer. This is typically required by the U.S. Army Corps of Engineers for restoration of temporary impact areas.

Monitoring locations will include restoration areas within 150 feet of Side Channel 1 at the north and south connection points with the proposed Side Channel 1 Extension. Other riparian planting areas within the 100-foot-wide easement encompassing the added side channel length and large woody structures within the channel will be documented in an as-built site plan and report and monitored during Year 1 after construction is complete but will not require further official monitoring. The District intends to utilize District staff and/or volunteers to maintain the riparian planting zones and remove nonnative, invasive species outside the required monitoring zones.

Construction of Side Channel 1 Extension is anticipated to be completed in 2024. Restoration plantings within the buffer will likely be installed in the winter or spring of 2024–2025. After construction and plant installation is completed, the as-built site plan and report will be prepared to document the baseline environmental site conditions. Subsequent monitoring reporting over a 3-year period will be based on the performance standards and goals. As-built documentation and Year 1 monitoring will be required for the entire restoration corridor (which includes the 100-foot-wide easement bracketing the proposed Side Channel 1 Extension). Further monitoring will only be required for temporary impact areas associated with Side Channel 1 in Years 2 and 3, as indicated in Table 12. If construction is delayed until 2025, then the monitoring years shown in the table will be adjusted accordingly. Should contingency measures need to be recommended due to poor plant performance, then additional planting may be recommended.

Table 12. Schedule of Monitoring Reporting by Year.

Year	Activity
2024	Construction Completion/As-Built ^a
2025	Year 1 Monitoring ^a
2026	Year 2 Monitoring ^b
2027	Year 3 Monitoring ^b

^a As-built and Year 1 monitoring is required for the entire restoration corridor (100-foot-wide easement over channel).

^b Year 2 and 3 monitoring is required within temporary impact areas associated with Side Channel 1 OHWM only.

As-Built Reporting

The purpose of the monitoring is to ensure that the project is functioning properly without degradation of adjacent aquatic areas and to assess if the side channel extension is meeting the standards to which it is designed.

After installation, an as-built report will be prepared by a qualified biologist to document the baseline environmental conditions at the project site. The as-built report will include plant counts and establish photograph points and plots or transects to be used to quantitatively document cover of native and invasive/nonnative species. The as-built report will also include documentation of any approved changes to the restoration plan; changes will be documented on an as-built map. The as-built report will be submitted to the regulatory agencies within 60 days after planting is complete on the site. Year 1 will start in the first growing season after planting is complete. A qualified biologist will conduct subsequent annual monitoring visits in summer.

The restoration elements outlined in Table 13 will be reported in the as-built report.

Table 13. Restoration Elements to Be Documented in an As-Built Report.	
Feature	Standards
Side Channel 1 Extension	Linear Feet: at least 1,908 Average OHWM: 20 Feet
Riparian Restoration (Forest Riparian Plantings in Pasture Areas in South Half)	At least 67,499 Square Feet
Riparian Restoration (Understory Riparian Plantings in Forested Areas in North Half)	At least 53,428 Square Feet
Scrub/Shrub Wetland Restoration	At least 2,891 Square Feet
Habitat Features	Fewer than 25 Engineered Log Structures embedded in the streambank

Additional details to be included in the as-built report include:

- Descriptions of the Side Channel 1 Extension: measurements of channel width, length and sediment/substrates.
- Designated photo points shall be established during the as-built reporting for recording of the existing site conditions in subsequent monitoring years. A minimum of four photo points shall be established. Photo points will include the temporary impact restoration locations at the north and south connection points of Side Channel 1 Extension with Side Channel 1.
- Evidence of fish passage and spawning, as applicable, shall be recorded. Incidental observations of wildlife or evidence of wildlife presence (e.g., scat or tracks) will be recorded during the as-built site visit and subsequent monitoring visits.

Maintenance and Contingencies

Maintenance of the installed native vegetation is to be provided by the District. However, the District's planting contractor will be responsible for achieving 100 percent plant survival and successful establishment of planted vegetation within the planting zones in accordance with Year 1 performance requirements. If plant survival is under 100 percent in Year 1, additional plants must be installed to achieve 100 percent survival. If desired, additional plants can be installed (over-planting) during construction to ensure greater success at meeting this performance standard and reduce the likelihood of replanting near the end of Year 1. For the forested area (north half) survival will also be measured in Years 2 and 3 and should be greater than 90 percent. If installed plants have less than 90 percent survival, additional plants shall be installed, based on recommendations by the monitoring biologist.

Native vegetation maintenance in the first 2 years will include, but is not limited to, supplemental irrigation in the south half of the project corridor (existing pasture areas) during summer months when less than 1 inch of precipitation occurs in 8 weeks; removal and control of invasive, nonnative vegetation; replenishing of wood chip mulch for weed suppression as necessary; and replacing plants that have died (if required, as determined necessary by the monitoring biologist). Irrigation is not necessary in the forest understory planting areas. Before plants are replaced, the District's contractor will consult with the project biologist to determine why certain species are not surviving and, if necessary, which native plant substitutions are appropriate.

Annual maintenance of the planting zones shall be implemented by the District during all three monitoring years, with the goal of meeting all the applicable performance standards by Year 3. Routine activities will include, but are not limited to, weed control, supplemental irrigation, mulching, reseeding, and plant replacement. Any noxious weeds, as listed on Snohomish County's current noxious weed list, which are identified within the restoration areas will be removed with small hand tools (e.g., weed eater, shovel, etc.). Herbicide treatment is not recommended unless it is determined to be necessary as a contingency measure to meet performance standards.

If success criteria for percent coverage of native plants and invasive, nonnative species have not been satisfied, maintenance activities may include, but are not limited to, plant replacement, plant substitution, adjustment of the planting layout to reflect specific or changing site conditions, weed control, installation and adjustment of plant protection devices, or other restoration methods approved by the U.S. Army Corps of Engineers and WDFW.

Should monitoring of the site indicate that the proposed restoration measures are not meeting performance standards, a qualified biologist or ecologist shall prepare a contingency plan to address deficiencies and recommend adaptive measures for project success.

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APPENDIX A

Delineation Methods



Wetland Delineation Methods

Wetland Delineation Methods

The wetland delineations for the Sultan River Side Channel 1 Extension were performed in accordance with the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010), which is consistent with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). These methods use a three-parameter approach for identifying and delineating wetlands: the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology. This wetland delineation was performed according to procedures specified for the routine wetland determination method (Environmental Laboratory 1987).

To identify potential wetlands, wetland biologists evaluated field conditions by traversing the study area and noting wetlands, streams, and other aquatic features. The biologists also documented conditions within 200 feet of the study area.

A test plot was established for each area that appeared to have potential wetland characteristics. For each test plot, data on dominant plant species, soil conditions, and evidence of hydrologic conditions were recorded on wetland determination data forms. Plants, soils, and hydrologic conditions were also analyzed and documented in adjacent uplands. Based on collected data, a determination of wetland or upland was made for each area examined.

Following confirmation of wetland conditions in each area, the wetland boundary was delineated by placing sequentially numbered, fluorescent pink flagging along the wetland perimeter. Test plot locations were marked with orange flagging. The locations of wetland boundaries and test plots were subsequently surveyed by David Evans and Associates, Inc.

Hydrophytic Vegetation

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

Plant Species Identification

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

Dominant Species Determination

Dominant species are those that contribute more than other species to the character of a plant community. To determine dominance, a vegetation sampling area is determined by the field biologist to accurately characterize the plant community that occurs in the area to be evaluated. Commonly, these are circular sampling areas, centered on the location of the test plot (where soil and hydrologic data is also collected). The radius of the circle is determined in the field, based on site conditions. In large wetlands, a typical sampling radius would be 2 to 5 meters for tree and sapling/shrub species, and 1 meter for herbaceous species. In a small or narrow wetland (or upland), the radius might be reduced to accurately sample wetland (upland) areas, thereby avoiding an overlap into an adjacent community having different vegetation, soils, or hydrologic conditions (Environmental Laboratory 2010).

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

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

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

The prevalence index (Indicator 3 on the wetland determination data form) is a weighted-average wetland indicator status of all plant species in the sampling plot, where weighting is by abundance (Environmental Laboratory 2010). This method is used where indicators of hydric soil and wetland hydrology are present, but the vegetation initially fails the rapid and dominance tests (Indicators 1 and 2). To determine the prevalence index, the absolute cover of each species in each stratum is determined. All

species (across all strata) are organized into wetland indicator status groups (i.e., OBL, FACW, FAC, FACU, or UPL) and their cover values are summed within the groups. The formula for the prevalence index is applied. If the prevalence index (which ranges from 1.0 to 5.0) equals 3.0 or less, this hydrophytic vegetation indicator is met.

Table A-1. Plant Indicator Status Categories.

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

WET ← $OBL - FACW - FAC - FACU - UPL$ → *DRY*

Source: Environmental Laboratory (1987).

Additional Hydrophytic Vegetation Indicators

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

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

The problematic hydrophytic vegetation indicator section in the USACE regional supplement further explains how to interpret situations in which hydric soils and wetland hydrology are present but hydrophytic vegetation Indicators 1 through 5 are lacking (Environmental Laboratory 2010). Procedures for looking at settings such as areas with active vegetation management (e.g., farms), areas dominated by aggressive invasive species, active floodplains, and low terraces are described, as well as explanations for specific situations, such as seasonal shifts in plant communities, extended drought conditions, and riparian areas.

Hydric Soils

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

For onsite soils characterization, hydric soils data were obtained generally by digging test pits at least 20 inches deep and 4 inches wide. Hydric soil conditions were evaluated using indicators outlined in *Field Indicators of Hydric Soils in the United States* (NRCS 2017) and adopted by the *Regional Supplement to the US Army Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (Environmental Laboratory 2010).

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

Wetland Hydrology

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

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

- Occurrence of aboveground growth and development of at least two non-evergreen vascular plant species growing within the wetland. Examples of this growth include the emergence or elongation of leaves on woody plants and the emergence or opening of flowers.
- Soil temperature, which can be measured once during a single site visit, should be at least 41°F or higher at a depth of 12 inches.

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

Antecedent Precipitation Analysis

Analyzing climatic conditions and local weather patterns are important in the assessment of vegetation, soil conditions, and hydrology for wetland delineations (Environmental Laboratory 1987, 2010), and information on precipitation that precedes a site visit is valuable in helping determine whether conditions observed at a site are reflective of normal rainfall. The NRCS (1997) provides methodology for the analysis of normal environmental conditions using antecedent rainfall measurements. For this method, “normal precipitation” is defined as ranges of normal precipitation or values falling within defined thresholds, in this case, the 30th and 70th percentile thresholds (Sprecher and Warne 2000). These ranges for a particular site are provided by WETS tables, which can be accessed through the NRCS National Water and Climate Center (NRCS 2018) and are calculated using long-term data (30 years) recorded at National Weather Service meteorological stations. USDA WETS tables display monthly average rainfall data (50th percentile) in addition to the upper and lower limits at which there is a 30 percent chance that rainfall will be more or less than the average (30th and 70th percentiles) (NRCS 2017). USDA WETS tables use climatological probabilities and are calculated on the basis of the most recent three decades of data, as factors such as climate change and different recording technologies may alter probabilities (Sprecher and Warne 2000). Currently, the 30-year range from 1991 to 2020 is used. This method makes the assumptions that rainfall is evenly distributed within a month, that antecedent precipitation can be properly evaluated for a 3-month period (i.e., assumes that evapotranspiration is the same in each season), that antecedent precipitation affects different systems similarly, and that snowmelt has the same contribution to hydrology as rainfall (Sprecher and Warne 2000).

To determine whether recent precipitation is reflective of normal precipitation, a representative weather station near the site is selected; since other conditions may affect precipitation (e.g., elevation, aspect, and proximity to mountains), the nearest station may not be the most representative of the site (Environmental Laboratory 2010). The procedure for determining normal precipitation uses measured rainfall data from the 3 months prior to the month of the site visit. For example, if the site visit occurs in September, precipitation data from June, July, and August would be analyzed. The recorded rainfall of each month is first compared to the long-term range of normal precipitation (30th and 70th percentiles) and is determined to have a “normal” condition if it falls within this range; if the recorded data is higher

or lower than the normal range, then it is determined to represent a “wet” or “dry” condition, respectively. The condition is then given a value, “1” for “dry,” “2” for “normal,” and “3” for “wet”; and this value is multiplied by the weighted monthly value, where the most recent month (1 month prior) is weighted heavier (3) than 3 months prior (1). The sum of this product is then used to determine whether the entire 3-month period is “drier than normal” (weighted score of 6–9), “normal” (10–14) or “wetter than normal” (15–18). While this method is useful for comparing a short-term time period to normal, this method is limited in that it discounts analysis of daily precipitation patterns within a given month (Sprecher and Warne 2000; Sumner et al. 2009).

Ordinary High Water Mark Delineation

The OHWMs of streams within the study area were delineated using the definition provided in the WAC, Section 222-16-010. According to this definition, the OHWM of streams is “that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation.” In addition, methods in the publication *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Anderson et al. 2016) were applied.

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

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

Biologists hung flagging on vegetation to mark the horizontal location of the OHWM which was located directly beneath the flag. The locations of the OHWM flags were subsequently surveyed by David Evans and Associates, Inc.

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APPENDIX B

Wetland Determination Forms



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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2022-01-27
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: SP100
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 0
 Subregion (LRR): A 2 Lat: 47.867279 Long: -121.825021 Datum: WGS 84
 Soil Map Unit Name: 66 - Sultan silt loam NWI classification: PFOC

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

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

Hydrophytic Vegetation Present?	Yes ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒	
Wetland Hydrology Present?	Yes ☐ No ☒	
Remarks: SP100 (upland) - Upland plot north of pasture property. Vegetation indicator met, soil and hydrology indicators not present.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B) Prevalence Index worksheet: Total % Cover of: Multiply by: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>100</u> x 3 = <u>300</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>100</u> (A) <u>300</u> (B) Prevalence Index = B/A = <u>3.00</u> Hydrophytic Vegetation Indicators: ☐ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ☐ 3 - Prevalence Index is ≤3.0 ¹ ☐ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ☐ 5 - Wetland Non-Vascular Plants ¹ ☐ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
_____ = Total Cover					
Sapling/Shrub Stratum (Plot size: <u>2m</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
_____ = Total Cover					
Herb Stratum (Plot size: <u>1m</u>)					
1. <u>Rubus armeniacus</u>	<u>100</u>	☒	<u>FAC</u>		
2. _____	_____	_____	_____		
3. _____	_____	_____	_____		
4. _____	_____	_____	_____		
5. _____	_____	_____	_____		
6. _____	_____	_____	_____		
7. _____	_____	_____	_____		
8. _____	_____	_____	_____		
9. _____	_____	_____	_____		
10. _____	_____	_____	_____		
11. _____	_____	_____	_____		
_____ = Total Cover					
Woody Vine Stratum (Plot size: <u>1m</u>)					
1. _____	_____	_____	_____		
2. _____	_____	_____	_____		
_____ = Total Cover					
% Bare Ground in Herb Stratum <u>0</u>					
Remarks: Vegetation indicator dominance test is present.					
Hydrophytic Vegetation Present? Yes ☒ No ☐					

SOIL

Sampling Point: SP100**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 16	2.5Y 3/3	100					Silty Clay Loam	
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

Charcoal and wood in bottom of pit. No hydric soil indicators present.

HYDROLOGY

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

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

Secondary Indicators (2 or more required)

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

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No ☒

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

Remarks:

Soil is moist throughout, however it is not growing season. No hydrologic indicators present.

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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2021-12-15
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: TP1
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): A 2 Lat: 47.866939 Long: -121.825281 Datum: WGS 84
 Soil Map Unit Name: 66 - Sultan silt loam NWI classification: _____

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

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

Hydrophytic Vegetation Present?	Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present?	Yes ☒ No _____	
Wetland Hydrology Present?	Yes _____ No ☒	
Remarks: TP1 (upland) - Upland pit, heavily disturbed from cows. Soil and vegetation indicators met. Hydrology indicator not met. Wetter than normal conditions.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>66.7</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>40</u> x 3 = <u>120</u> FACU species <u>20</u> x 4 = <u>80</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>60</u> (A) <u>200</u> (B) Prevalence Index = B/A = <u>3.33</u>
Sapling/Shrub Stratum (Plot size: <u>2m</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>1m</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Agrostis capillaris</u>	<u>30</u>	☒	<u>FAC</u>	
2. <u>Plantago lanceolata</u>	<u>10</u>	☒	<u>FACU</u>	
3. <u>Plantago major</u>	<u>10</u>	☒	<u>FAC</u>	
4. <u>Hypochaeris radicata</u>	<u>5</u>	_____	<u>FACU</u>	
5. <u>Trifolium pratense</u>	<u>3</u>	_____	<u>FACU</u>	
6. <u>Prunella vulgaris</u>	<u>2</u>	_____	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>1m</u>)				Hydrophytic Vegetation Present? Yes ☒ No _____
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>40</u>				
Remarks: Vegetation indicators present.				

SOIL

Sampling Point: TP1

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

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹		
0 - 3	10YR 3/2	98	10YR 4/4	2	C	M	Silt Loam
3 - 16	10YR 3/2	60	10YR 4/4	40	C	M	Silt
-							
-							
-							
-							
-							
-							

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

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

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

F6 indicator met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☐ No ☒ Depth (inches): _____

Saturation Present? Yes ☐ No ☒ Depth (inches): _____

(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

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

Remarks:

No hydrology indicators present.

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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2021-12-15
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: TP2
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): A 2 Lat: 47.866226 Long: -121.825691 Datum: WGS 84
 Soil Map Unit Name: 66 - Sultan silt loam NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes _____ No ☒	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: TP2 (upland) - No wetland indicators present. Wetter than normal conditions.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>2m</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>30</u> x 3 = <u>90</u> FACU species <u>40</u> x 4 = <u>160</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>70</u> (A) <u>250</u> (B) Prevalence Index = B/A = <u>3.57</u>
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>1m</u>)				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Agrostis capillaris</u>	<u>30</u>	☒	<u>FAC</u>	
2. <u>Trifolium pratense</u>	<u>30</u>	☒	<u>FACU</u>	
3. <u>Geranium molle</u>	<u>5</u>		<u>FACU</u>	
4. <u>Hypochaeris radicata</u>	<u>5</u>		<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>70%</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>1m</u>)				Hydrophytic Vegetation Present? Yes _____ No ☒
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>30</u>				
Remarks: No vegetation indicators.				

SOIL

Sampling Point: TP2**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 7	10YR 3/2	100					Silt Loam	Roots
7 - 16	10YR 4/2	100					Loam	Gravel and cobble
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

No hydric soil indicators.

HYDROLOGY

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

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

Secondary Indicators (2 or more required)

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

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No ☒

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

Remarks:

No hydrology indicators.

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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2021-12-15
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: TP3
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): A 2 Lat: 47.865603 Long: -121.825065 Datum: WGS 84
 Soil Map Unit Name: 66 - Sultan silt loam NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: TP3 (upland) - Vegetation indicator present, no soil or hydrology indicators present. Wetter than normal conditions.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____ = Total Cover				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>53</u> x 3 = <u>159</u> FACU species <u>7</u> x 4 = <u>28</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>60</u> (A) <u>187</u> (B) Prevalence Index = B/A = <u>3.12</u>
Sapling/Shrub Stratum (Plot size: <u>2m</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. _____	_____	_____	_____	
_____ = Total Cover				
Herb Stratum (Plot size: <u>1m</u>)				
1. <u>Agrostis capillaris</u>	<u>50</u>	☒	<u>FAC</u>	
2. <u>Trifolium pratense</u>	<u>5</u>	_____	<u>FACU</u>	
3. <u>Plantago major</u>	<u>3</u>	_____	<u>FAC</u>	
4. <u>Hypochaeris radicata</u>	<u>2</u>	_____	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
Woody Vine Stratum (Plot size: <u>1m</u>)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes ☒ No _____
2. _____	_____	_____	_____	
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>40</u>				
Remarks: Vegetation indicators present.				

SOIL

Sampling Point: TP3**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 9	10YR 3/2	100					Silt Loam	
9 - 16	2.5Y 4/3	2	7.5YR 4/4	98	C	M	Silt	
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

No hydric soil indicators present.

HYDROLOGY

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

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

Secondary Indicators (2 or more required)

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

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)**Wetland Hydrology Present?** Yes _____ No ☒

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

Remarks:

No hydrology indicators present.

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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2021-12-15
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: TP4
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): _____ Slope (%): _____
 Subregion (LRR): A 2 Lat: 47.865091 Long: -121.824729 Datum: WGS 84
 Soil Map Unit Name: 66 - Sultan silt loam NWI classification: _____

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

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

Hydrophytic Vegetation Present? Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present? Yes _____ No ☒	
Wetland Hydrology Present? Yes _____ No ☒	
Remarks: TP4 (upland) - Soil and hydrology indicators not present. Vegetation indicator present. Wetter than normal conditions.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>35</u></td> <td>x 3 = <u>105</u></td> </tr> <tr> <td>FACU species <u>5</u></td> <td>x 4 = <u>20</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>40</u> (A)</td> <td><u>125</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.13</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>35</u>	x 3 = <u>105</u>	FACU species <u>5</u>	x 4 = <u>20</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>40</u> (A)	<u>125</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>35</u>	x 3 = <u>105</u>																	
FACU species <u>5</u>	x 4 = <u>20</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>40</u> (A)	<u>125</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>2m</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover																		
Herb Stratum (Plot size: <u>1m</u>) 1. <u>Poa pratensis</u> <u>30</u> ☒ <u>FAC</u> 2. <u>Plantago lanceolata</u> <u>5</u> _____ <u>FACU</u> 3. <u>Ranunculus repens</u> <u>5</u> _____ <u>FAC</u> 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ _____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>1m</u>) 1. _____ 2. _____ _____ = Total Cover % Bare Ground in Herb Stratum <u>60</u>				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Hydrophytic Vegetation Present? Yes ☒ No _____																		
Remarks: Vegetation indicator present.																		

SOIL

Sampling Point: TP4**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 6	10YR 3/2	100	7.5YR 4/4	5	C	M	Silt Loam	Charcoal bits
6 - 14	2.5Y 3/3	100					Silt Loam	No rocks
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

No hydric soil indicators present. High matrix chroma: 3 at depths below 6".

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No ☒

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

Remarks:

No hydrology indicators present.

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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2021-12-15
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: TP5
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): None Slope (%): 0
 Subregion (LRR): A 2 Lat: 47.865875 Long: -121.824895 Datum: WGS 84
 Soil Map Unit Name: 66 - Sultan silt loam NWI classification: PFOC

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

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

Hydrophytic Vegetation Present?	Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes ☒ No _____
Hydric Soil Present?	Yes ☒ No _____	
Wetland Hydrology Present?	Yes ☒ No _____	
Remarks: TP5 (wetland) - all three wetland parameters present. In lowest point of swale, small area, approximately 8" lower than upland. Wetter than normal conditions.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)														
1. _____	_____	_____	_____															
2. _____	_____	_____	_____															
3. _____	_____	_____	_____															
4. _____	_____	_____	_____															
_____ = Total Cover				Prevalence Index worksheet: <table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>0</u></td> <td>x 2 = <u>0</u></td> </tr> <tr> <td>FAC species <u>80</u></td> <td>x 3 = <u>240</u></td> </tr> <tr> <td>FACU species <u>10</u></td> <td>x 4 = <u>40</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>90</u> (A)</td> <td><u>280</u> (B)</td> </tr> </table> Prevalence Index = B/A = <u>3.11</u>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>0</u>	x 2 = <u>0</u>	FAC species <u>80</u>	x 3 = <u>240</u>	FACU species <u>10</u>	x 4 = <u>40</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>90</u> (A)	<u>280</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>0</u>	x 1 = <u>0</u>																	
FACW species <u>0</u>	x 2 = <u>0</u>																	
FAC species <u>80</u>	x 3 = <u>240</u>																	
FACU species <u>10</u>	x 4 = <u>40</u>																	
UPL species <u>0</u>	x 5 = <u>0</u>																	
Column Totals: <u>90</u> (A)	<u>280</u> (B)																	
Sapling/Shrub Stratum (Plot size: <u>2m</u>) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover																		
Herb Stratum (Plot size: <u>1m</u>) 1. <u>Poa pratensis</u> <u>75</u> ☒ <u>FAC</u> 2. <u>Geranium molle</u> <u>5</u> _____ <u>FACU</u> 3. <u>Trifolium pratense</u> <u>5</u> _____ <u>FACU</u> 4. <u>Ranunculus repens</u> <u>5</u> _____ <u>FAC</u> 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ _____ = Total Cover																		
Woody Vine Stratum (Plot size: <u>1m</u>) 1. _____ 2. _____ _____ = Total Cover % Bare Ground in Herb Stratum <u>10</u>				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 ¹ ___ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants ¹ ___ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
Remarks: Vegetation indicators present.																		

SOIL

Sampling Point: TP5

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 2	10YR 3/2	98	10YR 4/4	2	C	M	Silt Loam	
2 - 12	10YR 3/2	68	10YR 4/4	30	C	M	Loam	
2 - 12	10YR 3/2	68	10YR 3/4	2	C	M	Loam	
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

F6 indicator present.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): _____

Water Table Present? Yes ☒ No ☐ Depth (inches): 11

Saturation Present? Yes ☒ No ☐ Depth (inches): 9
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

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

Remarks:

Water table and saturation indicators present.

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

Project/Site: Sultan River Side Channel Restoration City/County: Sultan/Snohomish Sampling Date: 2021-12-15
 Applicant/Owner: Sno Co. PUD State: Washington Sampling Point: TP6
 Investigator(s): Tina Mirabile, Danielle Rapoza Section, Township, Range: S31 T28N R8E
 Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): _____ Slope (%): 0
 Subregion (LRR): A 2 Lat: 47.868875 Long: -121.824571 Datum: WGS 84
 Soil Map Unit Name: 50 - Pilchuck loamy sand NWI classification: PFOC

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

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

Hydrophytic Vegetation Present?	Yes ☒ No _____	Is the Sampled Area within a Wetland? Yes _____ No ☒
Hydric Soil Present?	Yes _____ No ☒	
Wetland Hydrology Present?	Yes _____ No ☒	
Remarks: TP6 (upland) - No soil or hydrology indicators. Vegetation indicator present. Wetter than normal conditions.		

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75</u> (A/B)
1. <u>Acer circinatum</u>	<u>50</u>	☒	<u>FAC</u>	
2. <u>Populus balsamifera</u>	<u>48</u>	☒	<u>FAC</u>	
3. <u>Tsuga heterophylla</u>	<u>2</u>		<u>FACU</u>	
4. _____				
<u>100%</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>2m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>158</u> x 3 = <u>474</u> FACU species <u>14</u> x 4 = <u>56</u> UPL species <u>0</u> x 5 = <u>0</u> Column Totals: <u>172</u> (A) <u>530</u> (B) Prevalence Index = B/A = <u>3.08</u>
1. <u>Rubus spectabilis</u>	<u>50</u>	☒	<u>FAC</u>	
2. <u>Populus balsamifera</u>	<u>10</u>		<u>FAC</u>	
3. _____				
4. _____				
5. _____				
<u>60%</u> = Total Cover				
Herb Stratum (Plot size: <u>1m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: ____ 1 - Rapid Test for Hydrophytic Vegetation ☒ 2 - Dominance Test is >50% ____ 3 - Prevalence Index is ≤3.0 ¹ ____ 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) ____ 5 - Wetland Non-Vascular Plants ¹ ____ Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Polystichum munitum</u>	<u>10</u>	☒	<u>FACU</u>	
2. <u>Rubus ursinus</u>	<u>2</u>		<u>FACU</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
<u>12%</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>1m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Present? Yes ☒ No _____
1. _____				
2. _____				
_____ = Total Cover				
% Bare Ground in Herb Stratum <u>88</u>				
Remarks: Vegetation indicator present.				

SOIL

Sampling Point: TP6**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0 - 11	10YR 3/2	100					Silt Loam	
-								
-								
-								
-								
-								
-								
-								
-								

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.²Location: PL=Pore Lining, M=Matrix.**Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)****Indicators for Problematic Hydric Soils³:**

☐ Histosol (A1)	☐ Sandy Redox (S5)	☐ 2 cm Muck (A10)
☐ Histic Epipedon (A2)	☐ Stripped Matrix (S6)	☐ Red Parent Material (TF2)
☐ Black Histic (A3)	☐ Loamy Mucky Mineral (F1) (except MLRA 1)	☐ Very Shallow Dark Surface (TF12)
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Other (Explain in Remarks)
☐ Depleted Below Dark Surface (A11)	☐ Depleted Matrix (F3)	
☐ Thick Dark Surface (A12)	☐ Redox Dark Surface (F6)	
☐ Sandy Mucky Mineral (S1)	☐ Depleted Dark Surface (F7)	
☐ Sandy Gleyed Matrix (S4)	☐ Redox Depressions (F8)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☒

Remarks:

No hydric soil indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)

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

Field Observations:Surface Water Present? Yes _____ No ☒ Depth (inches): _____Water Table Present? Yes _____ No ☒ Depth (inches): _____Saturation Present? Yes _____ No ☒ Depth (inches): _____
(includes capillary fringe)Wetland Hydrology Present? Yes _____ No ☒

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

Remarks:

No hydrology indicators present.

APPENDIX C

Ecology Wetland Ratings Forms



Wetland name or number W2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 2 Date of site visit: 7/28/21, 12/15/21

Rated by D. Rapoza Trained by Ecology? ☒ Yes ☐ No Date of Training 10/2018

HGM Class used for rating Riverine Wetland has multiple HGM classes? ☐ Yes ☒ No

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

Source of base aerial photo/map 2022 Google Earth

OVERALL WETLAND CATEGORY III (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

Category III – Total score = 16 – 19

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	L	L	L	
Landscape Potential	H	M	H	
Value	L	H	H	TOTAL
Score Based on Ratings	5	6	7	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	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	☒

Wetland name or number W2

Maps and figures required to answer questions correctly for Western Washington

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	C1
Hydroperiods	H 1.2	C3
Ponded depressions	R 1.1	C3
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	R 2.4	C3
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	NA*
Width of unit vs. width of stream (<i>can be added to another figure</i>)	R 4.1	C3
Map of the contributing basin	R 2.2, R 2.3, R 5.2	C5
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	C6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	C7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	C7

*Plant cover is less than 90% therefore this is not shown on figures.

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 types 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).

Wetland name or number W2

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
Choose an item.

*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 W2

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS
Water Quality Functions – Indicators that the site functions to improve water quality

R 1.0. Does the site have the potential to improve water quality?		
R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: Depressions present but cover <1/2 area of wetland points = 2	2	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes) Trees, shrubs, and ungrazed herbaceous <1/3 area of the wetland points = 0	0	
Total for R 1	Add the points in the boxes above	2

Rating of Site Potential

If score is: 0–5 = L

Record the rating on the first page

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

Rating of Landscape Potential

If score is: 3–6 = H

Record the rating on the first page

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

Rating of Value

If score is: 0 = L

Record the rating on the first page

COMMENTS:

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS**Hydrologic Functions – Indicators that site functions to reduce flooding and stream erosion****R 4.0. Does the site have the potential to reduce flooding and erosion?**

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

Rating of Site Potential

If score is: 0–5 = L

*Record the rating on the first page***R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?**

R 5.1. Is the stream or river adjacent to the wetland downcut?	No = 1	1
R 5.2. Does the up-gradient watershed include a UGA or incorporated area?	Yes = 1	1
R 5.3. Is the up-gradient stream or river controlled by dams?	Yes = 0	0
Total for R 5	Add the points in the boxes above	2

Rating of Landscape Potential

If score is: 1 or 2 = M

*Record the rating on the first page***R 6.0. Are the hydrologic functions provided by the site valuable to society?**

R 6.1. Distance to the nearest areas downstream that have flooding problems? <i>Choose the description that best fits the site.</i> The subbasin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resours (e.g., houses or salmon redds) points = 2	2
R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2	2
Total for R 6	Add the points in the boxes above 4

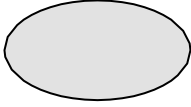
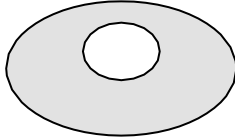
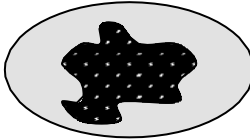
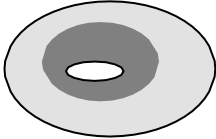
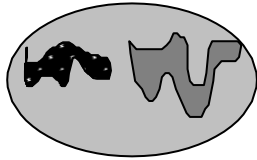
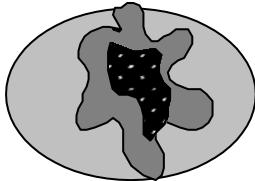
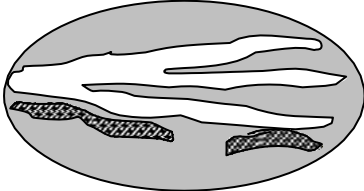
Rating of Value

If score is: 2–4 = H

Record the rating on the first page

COMMENTS: The Sultan Shoreline Master Program identifies this area as frequently flooded. Wetland is located within the floodway of Sultan River.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: <i>Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.</i> ☐ Aquatic bed ☒ Emergent ☐ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) <i>If the unit has a Forested class, check if:</i> ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1 structure points = 0	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (<i>see text for descriptions of hydroperiods</i>). ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☒ Occasionally flooded or inundated ☐ Saturated only ☒ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ Lake Fringe wetland ☐ Freshwater tidal wetland	2 types present points = 1 2 points 2 points	1
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.</i> If you counted: <5 species points = 0		0

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i> Choose an item.  None = 0 points  Low = 1 point  Moderate = 2 points     All three diagrams in this row are HIGH = 3 points	1
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> ☐ 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 (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) ☐ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) ☒ 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>)	3
Total for H 1	5

Rating of Site Potential

If score is: 0–6 = L

Add the points in the boxes above

Record the rating on the first page

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat <u>7</u> + [(% moderate and low intensity land uses)/2] <u>23</u> = 30% If total accessible habitat is: 20–33% of 1 km Polygon points = 2	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u>15</u> + [(% moderate and low intensity land uses)/2] <u>24.5</u> = 39.5% Undisturbed habitat 10–50% and in 1–3 patches points = 2	2
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity points = 0	0
Total for H 2	4

Rating of Landscape Potential

If score is: 4–6 = H

Add the points in the boxes above

Record the rating on the first page

Wetland name or number W2

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.*

2

Site meets ANY of the following criteria:

points = 2

- ☒ It has 3 or more priority habitats within 100 m (see next page)
- ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)
- ☐ It is mapped as a location for an individual WDFW priority species
- ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources
- ☒ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan

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

points = 1

Site does not meet any of the criteria above

points = 0

Rating of Value

If score is: 2 = H

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: <https://wdfw.wa.gov/species-habitats/at-risk/phs/list>).

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit:

NOTE: This question is independent of the land use between the wetland unit and the priority habitat.

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i> SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? - The dominant water regime is tidal, - Vegetated, and - With a salinity greater than 0.5 ppt Yes: Go to SC 1.1 ✓ No = Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No: Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? - The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of nonnative plant species. (If nonnative species are <i>Spartina</i>, see page 25) - At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. - The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. I
	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes: Go to SC 2.2 ✓ No: Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes: Contact WNHP/WDNR and go to SC 2.4 ✓ No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	Cat. I

SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES, you will still need to rate the wetland based on its functions.</i> SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to SC 3.3 ✓ No – Go to SC 3.2 SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to SC 3.3 ✓ No = Is not a bog SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = Is a Category I bog No – Go to SC 3.4 NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (>30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = Is a Category I bog No = Is not a bog	Cat. I
SC 4.0. Forested Wetlands Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES, you will still need to rate the wetland based on its functions.</i> • Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. • Mature forests (west of the Cascade Crest): Stands where the largest trees are 80–200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = Category I ✓ No = Not a forested wetland for this section	Cat. I
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? • The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks • The lagoon in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>) 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 3/4 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 ft²) Yes = Category I No = Category II	Cat. I Cat. II

Wetland name or number W2

SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i> 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	Cat I
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	Cat. II
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	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	Cat. IV
Category of wetland based on Special Characteristics If you answered No for all types, enter “Not Applicable” on Summary Form	NA

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Wetland name or number W3

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 3 Date of site visit: 7/29/21, 12/15/21

Rated by D. Rapoza Trained by Ecology? ☒ Yes ☐ No Date of Training 10/2018

HGM Class used for rating Slope Wetland has multiple HGM classes? ☐ Yes ☒ No

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

Source of base aerial photo/map 2022 Google Earth

OVERALL WETLAND CATEGORY IV (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

Category IV – Total score = 9 – 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	L	L	L	
Landscape Potential	M	L	H	
Value	L	H	M	TOTAL
Score Based on Ratings	4	5	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	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	☒

Wetland name or number W3

Maps and figures required to answer questions correctly for Western Washington

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	C1
Hydroperiods	H 1.2	C2
Plant cover of dense trees, shrubs, and herbaceous plants	S 1.3	NA*
Plant cover of dense, rigid trees, shrubs, and herbaceous plants (<i>can be added to figure above</i>)	S 4.1	NA*
Boundary of 150 ft buffer (<i>can be added to another figure</i>)	S 2.1, S 5.1	C2
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	C6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	C7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	C7

*Emergent plants are dominated by thin stemmed grasses and rushes and are grazed by cattle therefore this is not shown on figures.

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**

Wetland name or number W3

NOTE: Surface water does not pond in these types 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
Choose an item.

*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 W3

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: (<i>a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance</i>) Slope is 1% or less points = 3	3	
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (<i>use NRCS definitions</i>):	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. <i>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.</i> Does not meet any of the criteria above for plants points = 0		0
Total for S 1	Add the points in the boxes above	3
Rating of Site Potential If score is: 0–5 = L <i>Record the rating on the first page</i>		
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	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1?	No = 0	0
If yes, other sources:		
Total for S 2	Add the points in the boxes above	1
Rating of Landscape Potential If score is: 1–2 = M <i>Record the rating on the first page</i>		
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?	No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? <i>At least one aquatic resource in the basin is on the 303(d) list.</i>	No = 0	0
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? <i>Answer YES if there is a TMDL for the basin in which unit is found.</i>	No = 0	0
Total for S 3	Add the points in the boxes above	0
Rating of Value If score is: 0 = L <i>Record the rating on the first page</i>		
COMMENTS: S 2.1 – The property is grazed by several cows.		

Wetland name or number W3

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. <i>Stems of plants should be thick enough (usually >1/8 in), or dense enough, to remain erect during surface flows.</i> All other conditions points = 0	0
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Rating of Site Potential

If score is: 0 = L

Record the rating on the first page

S 5.0. Does the landscape have the potential to support the 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? No = 0	0
---	---

Rating of Landscape Potential

If score is: 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 subbasin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2	2
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2	2
Total for S 6	4

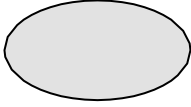
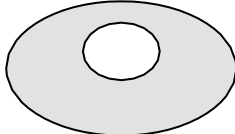
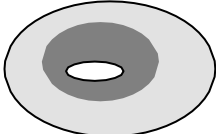
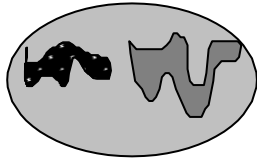
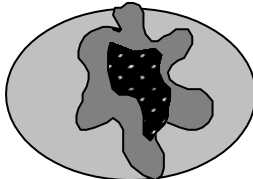
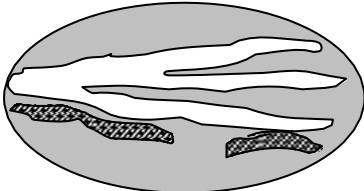
Rating of Value

If score is: 2–4 = H

Record the rating on the first page

NOTES and FIELD OBSERVATIONS: The Sultan Shoreline Master Program identifies this area as frequently flooded.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: <i>Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.</i> ☐ Aquatic bed ☒ Emergent ☐ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) <i>If the unit has a Forested class, check if:</i> ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1 structure points = 0	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (<i>see text for descriptions of hydroperiods</i>). ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☒ Saturated only ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ Lake Fringe wetland ☐ Freshwater tidal wetland	1 type present points = 0 2 points 2 points	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.</i> If you counted: <5 species points = 0		0

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i> Choose an item.  None = 0 points  Low = 1 point  Moderate = 2 points     All three diagrams in this row are HIGH = 3 points	0
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> ☐ 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 (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) ☐ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) ☐ 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>)	0
Total for H 1	0
Rating of Site Potential If score is: 0–6 = L <i>Record the rating on the first page</i>	
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat <u>7</u> + [(% moderate and low intensity land uses)/2] <u>23</u> = <u>30%</u> If total accessible habitat is: 20–33% of 1 km Polygon points = 2	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u>15</u> + [(% moderate and low intensity land uses)/2] <u>24.5</u> = <u>39.5%</u> Undisturbed habitat 10–50% and in 1–3 patches points = 2	2
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity points = 0	0
Total for H 2	4
Rating of Landscape Potential If score is: 4–6 = H <i>Record the rating on the first page</i>	

Wetland name or number W3

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.*

1

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

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

points = 1

Site does not meet any of the criteria above

points = 0

Rating of Value

If score is: 1 = M

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: <https://wdfw.wa.gov/species-habitats/at-risk/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 <i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	Category
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? • The dominant water regime is tidal, • Vegetated, and • With a salinity greater than 0.5 ppt Yes: Go to SC 1.1 ☒ No = Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No: Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? • The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of nonnative plant species. (If nonnative species are <i>Spartina</i>, see page 25) • At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. • The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. I
	Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes: Go to SC 2.2 ☒ No: Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I ☒ No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes: Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	Cat. I

SC 3.0. Bogs

Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below. If you answer YES, you will still need to rate the wetland based on its functions.*

SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?

Yes – Go to **SC 3.3**  No – Go to **SC 3.2**

SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?

Yes – Go to **SC 3.3** No = **Is not a bog**

SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4**

NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.

SC 3.4. Is an area with peats or mucks forested (>30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?

Yes = Is a Category I bog ✓ No = Is not a bog

Cat. I

SC 4.0. Forested Wetlands

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

- **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.
- **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80–200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

section

Cat. I

SC 5.0. Wetlands in Coastal Lagoons

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

- The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks
- The lagoon in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

Yes – Go to **SC 5.1**

✓ No = Not a wetland in a coastal lagoon

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

- The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).
 - At least 3/4 of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.
 - The wetland is larger than 1/10 ac (4350 ft²)
- Yes = **Category I** No = **Category II**

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

Cat. I

Cat. II

Wetland name or number W3

SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i> In practical terms that means the following geographic areas: • Long Beach Peninsula: Lands west of SR 103 • Grayland-Westport: Lands west of SR 105 • Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to SC 6.1 ✓ No = not an interdunal wetland for rating SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = Category I No – Go to SC 6.2 SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = Category II No – Go to SC 6.3 SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	Cat I Cat. II Cat. III Cat. IV
Category of wetland based on Special Characteristics If you answered No for all types, enter “Not Applicable” on Summary Form	NA

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Wetland name or number W4/5

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 4/5 Date of site visit: 7/29/21, 12/15/21

Rated by D. Rapoza Trained by Ecology? ☒ Yes ☐ No Date of Training 10/2018

HGM Class used for rating depressional Wetland has multiple HGM classes? ☐ Yes ☒ No

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

Source of base aerial photo/map 2022 Google Earth

OVERALL WETLAND CATEGORY III (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

Category III – Total score = 16 – 19

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	M	M	L	
Landscape Potential	M	M	H	
Value	L	H	M	TOTAL
Score Based on Ratings	5	7	6	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	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	☒

Wetland name or number W4/5

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	C1
Hydroperiods	D 1.4, H 1.2	C2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	C2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	C2
Map of the contributing basin	D 4.3, D 5.3	C5
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	C6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	C7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	C7

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 types 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).

Wetland name or number W4/5

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
Choose an item.

*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 W4/5

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	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). 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 > 1/10 of area points = 1	1
D 1.4. Characteristics of seasonal ponding or inundation: <i>This is the area that is ponded for at least 2 months. See description in manual.</i> Area seasonally ponded is > 1/2 total area of wetland points = 4	4
Total for D 1	Add the points in the boxes above (F9 key) 8

Rating of Site Potential

If score is: 6–11 = M

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? 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	1
D 2.3. Are there septic systems within 250 ft of the wetland? 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: _____ Choose an item.	0
Total for D 2	Add the points in the boxes above 1

Rating of Landscape Potential

If score is: 1 or 2 = M

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? No = 0	0
D 3.2. Is the wetland in a basin or subbasin where an aquatic resource is on the 303(d) list? No = 0	0
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)? No = 0	0
Total for D 3	Add the points in the boxes above 0

Rating of Value

If score is: 0 = L

Record the rating on the first page

COMMENTS:

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	4
D 4.2. <u>Depth of storage during wet periods:</u> 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 less than 0.5 ft (6 in) points = 0	0
D 4.3. <u>Contribution of the wetland to storage in the watershed:</u> 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 10 to 100 times the area of the unit points = 3	3
Total for D 4	7

Rating of Site Potential

If score is: 6–11 = M

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? No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? No = 0	0
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	1
Total for D 5	1

Rating of Landscape Potential

If score is: 1 or 2 = M

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 subbasin that is immediately down-gradient of unit points = 2 If not applicable chosen above: Choose an item. Explanation for 0 points (if required above):	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2	2
Total for D 6	4

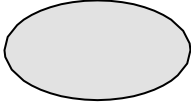
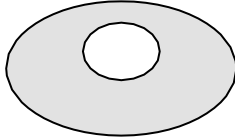
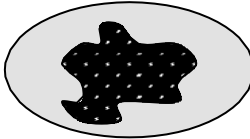
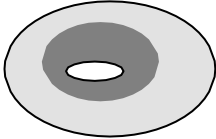
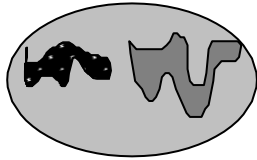
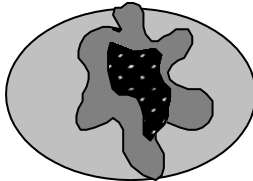
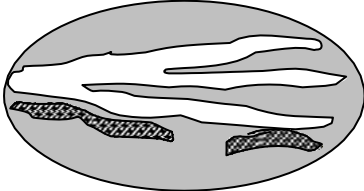
Rating of Value

If score is: 2–4 = H

Record the rating on the first page

COMMENTS: The Sultan Shoreline Master Program identifies this area as frequently flooded.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: <i>Indicators are Cowardin classes and strata within the Forested class.</i> Check the Cowardin plant classes in the wetland. <i>Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.</i> ☐ Aquatic bed ☐ Emergent (<i>less than 10%</i>) ☒ Scrub-shrub (areas where shrubs have >30% cover) ☒ Forested (areas where trees have >30% cover) <i>If the unit has a Forested class, check if:</i> ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	2 structures points = 1	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (<i>see text for descriptions of hydroperiods</i>). ☒ Permanently flooded or inundated ☒ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☐ Saturated only (<i>less than 10%</i>) ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ Lake Fringe wetland ☐ Freshwater tidal wetland	2 types present points = 1 2 points 2 points	1
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.</i> If you counted: 5–19 species points = 1		1

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i> Choose an item.  None = 0 points  ✓ Low = 1 point  Moderate = 2 points     All three diagrams in this row are HIGH = 3 points	1
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> ☐ 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 (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) ☒ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) ☐ 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>)	1
Total for H 1	5

Rating of Site Potential

If score is: 0–6 = L

Record the rating on the first page

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat $\underline{7} + [(\% \text{ moderate and low intensity land uses})/2] \underline{23} = \underline{30}\%$ If total accessible habitat is: 20–33% of 1 km Polygon points = 2	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat $\underline{15} + [(\% \text{ moderate and low intensity land uses})/2] \underline{24.5} = \underline{39.5}\%$ Undisturbed habitat 10–50% and in 1–3 patches points = 2	2
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity points = 0	0
Total for H 2	2

Rating of Landscape Potential

If score is: 4–6 = H

Record the rating on the first page

Wetland name or number W4/5

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.*

1

Site meets ANY of the following criteria:

points = 2

- ☐ It has 3 or more priority habitats within 100 m (see next page)
- ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)
- ☐ It is mapped as a location for an individual WDFW priority species
- ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources
- ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan

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

points = 1

Site does not meet any of the criteria above

points = 0

Rating of Value

If score is: 1 = M

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: <https://wdfw.wa.gov/species-habitats/at-risk/phs/list>).

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit:

NOTE: This question is independent of the land use between the wetland unit and the priority habitat.

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

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

Wetland name or number W6

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 6 Date of site visit: 7/29/21, 12/15/21

Rated by D. Rapoza Trained by Ecology? ☒ Yes ☐ No Date of Training 10/2018

HGM Class used for rating depressional Wetland has multiple HGM classes? ☐ Yes ☒ No

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

Source of base aerial photo/map 2022 Google Earth

OVERALL WETLAND CATEGORY IV (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

Category IV – Total score = 9 – 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	L	M	L	
Landscape Potential	M	L	H	
Value	L	H	L	TOTAL
Score Based on Ratings	4	6	5	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	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	☒

Wetland name or number W6

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	C1
Hydroperiods	D 1.4, H 1.2	C2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	C2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	C2
Map of the contributing basin	D 4.3, D 5.3	C5
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	C6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	C7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	C7

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 types 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).

Wetland name or number W6

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
Choose an item.

*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 W6

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	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). 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 < 1/10 of area points = 0	0
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 < 1/4 total area of wetland points = 0	0
Total for D 1	Add the points in the boxes above (F9 key) 3

Rating of Site Potential

If score is: 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? 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	1
D 2.3. Are there septic systems within 250 ft of the wetland? 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: _____ Choose an item.	0
Total for D 2	Add the points in the boxes above 1

Rating of Landscape Potential

If score is: 1 or 2 = M

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? No = 0	0
D 3.2. Is the wetland in a basin or subbasin where an aquatic resource is on the 303(d) list? No = 0	0
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)? No = 0	0
Total for D 3	Add the points in the boxes above 0

Rating of Value

If score is: 0 = L

Record the rating on the first page

COMMENTS:

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	4
D 4.2. <u>Depth of storage during wet periods:</u> 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 less than 0.5 ft (6 in) points = 0	0
D 4.3. <u>Contribution of the wetland to storage in the watershed:</u> 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 10 to 100 times the area of the unit points = 3	3
Total for D 4	7

Rating of Site Potential

If score is: 6–11 = M

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? No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? No = 0	0
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.)? No = 0	0
Total for D 5	0

Rating of Landscape Potential

If score is: 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 subbasin that is immediately down-gradient of unit points = 2 If not applicable chosen above: Choose an item. Explanation for 0 points (if required above):	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2	2
Total for D 6	4

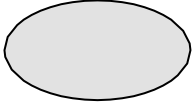
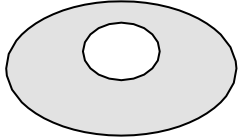
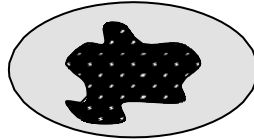
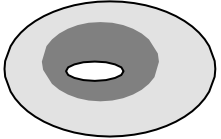
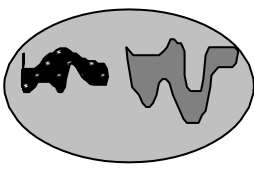
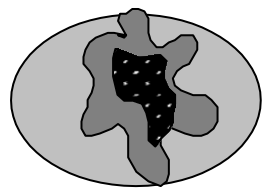
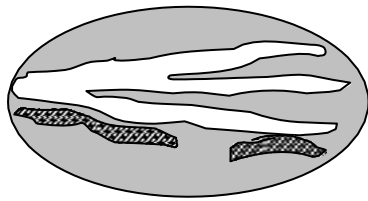
Rating of Value

If score is: 2–4 = H

Record the rating on the first page

COMMENTS: The Sultan Shoreline Master Program identifies this area as frequently flooded.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: <i>Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.</i> ☐ Aquatic bed ☒ Emergent ☐ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) <i>If the unit has a Forested class, check if:</i> ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1 structure points = 0	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (<i>see text for descriptions of hydroperiods</i>). ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☒ Saturated only ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ Lake Fringe wetland ☐ Freshwater tidal wetland	1 type present points = 0 2 points 2 points	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.</i> If you counted: <5 species points = 0		0

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i> Choose an item.  ✓ None = 0 points  Low = 1 point  Moderate = 2 points     All three diagrams in this row are HIGH = 3 points	0
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> ☐ 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 (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) ☐ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) ☐ 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>)	0
Total for H 1	0
Rating of Site Potential If score is: 0–6 = L <i>Record the rating on the first page</i>	
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat <u>7</u> + [(% moderate and low intensity land uses)/2] <u>23</u> = <u>30</u>% If total accessible habitat is: 20–33% of 1 km Polygon points = 2	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u>15</u> + [(% moderate and low intensity land uses)/2] <u>24.5</u> = <u>39.5</u>% Undisturbed habitat 10–50% and in 1–3 patches points = 2	2
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity points = 0	0
Total for H 2	4
Rating of Landscape Potential If score is: 4–6 = H <i>Record the rating on the first page</i>	

Wetland name or number W6

H 3.0. Is the habitat provided by the site valuable to society?

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.*

0

Site meets ANY of the following criteria:

points = 2

- ☐ It has 3 or more priority habitats within 100 m (see next page)
- ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)
- ☐ It is mapped as a location for an individual WDFW priority species
- ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources
- ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan

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

points = 1

✓ Site does not meet any of the criteria above

points = 0

Rating of Value

If score is: 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: <https://wdfw.wa.gov/species-habitats/at-risk/phs/list>).

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit:

NOTE: *This question is independent of the land use between the wetland unit and the priority habitat.*

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? - The dominant water regime is tidal, - Vegetated, and - With a salinity greater than 0.5 ppt Yes: Go to SC 1.1 ✓ No = Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No: Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? - The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of nonnative plant species. (If nonnative species are <i>Spartina</i>, see page 25) - At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. - The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. I Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes: Go to SC 2.2 No: Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I ✓ No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes: Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	Cat. I

SC 3.0. Bogs

Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below. If you answer YES, you will still need to rate the wetland based on its functions.*

SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?

Yes – Go to **SC 3.3** ✓ No – Go to **SC 3.2**

SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?

Yes – Go to **SC 3.3**  No = **Is not a bog**

SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4**

NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.

SC 3.4. Is an area with peats or mucks forested (>30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?

Yes = Is a Category I bog No = Is not a bog

Cat. I

SC 4.0. Forested Wetlands

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

- **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.
- **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80–200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

Cat. I

SC 5.0. Wetlands in Coastal Lagoons

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

- The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks
- The lagoon in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

Yes – Go to **SC 5.1** ✓ No = **Not a wetland in a coastal lagoon**

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

- The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).
 - At least 3/4 of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.
 - The wetland is larger than 1/10 ac (4350 ft²)
- Yes = **Category I** No = **Category II**

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

Cat. I

Cat. II

Wetland name or number W6

SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i> 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	Cat. I
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	Cat. II
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	Cat. III
Category of wetland based on Special Characteristics If you answered No for all types, enter “Not Applicable” on Summary Form	Cat. IV
	NA

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Wetland name or number W7

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 7 Date of site visit: 7/29/21, 12/15/21

Rated by D. Rapoza Trained by Ecology? ☒ Yes ☐ No Date of Training 10/2018

HGM Class used for rating depressional Wetland has multiple HGM classes? ☐ Yes ☒ No

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

Source of base aerial photo/map 2022 Google Earth

OVERALL WETLAND CATEGORY IV (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

Category IV – Total score = 9 – 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	L	M	L	
Landscape Potential	M	L	H	
Value	L	H	L	TOTAL
Score Based on Ratings	4	6	5	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	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	☒

Wetland name or number W7

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	C1
Hydroperiods	D 1.4, H 1.2	C2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	C2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	C2
Map of the contributing basin	D 4.3, D 5.3	C5
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	C6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	C7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	C7

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 types 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).

Wetland name or number W7

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
Choose an item.

*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 W7

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	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). 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 < 1/10 of area points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: <i>This is the area that is ponded for at least 2 months. See description in manual.</i> Area seasonally ponded is < 1/4 total area of wetland points = 0	0
Total for D 1	Add the points in the boxes above (F9 key) 3

Rating of Site Potential

If score is: 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? 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	1
D 2.3. Are there septic systems within 250 ft of the wetland? 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: _____ Choose an item.	0
Total for D 2	Add the points in the boxes above 1

Rating of Landscape Potential

If score is: 1 or 2 = M

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? No = 0	0
D 3.2. Is the wetland in a basin or subbasin where an aquatic resource is on the 303(d) list? No = 0	0
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)? No = 0	0
Total for D 3	Add the points in the boxes above 0

Rating of Value

If score is: 0 = L

Record the rating on the first page

COMMENTS:

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	4
D 4.2. <u>Depth of storage during wet periods:</u> 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 less than 0.5 ft (6 in) points = 0	0
D 4.3. <u>Contribution of the wetland to storage in the watershed:</u> 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 10 to 100 times the area of the unit points = 3	3
Total for D 4	7

Rating of Site Potential

If score is: 6–11 = M

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? No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? No = 0	0
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.)? No = 0	0
Total for D 5	0

Rating of Landscape Potential

If score is: 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 subbasin that is immediately down-gradient of unit points = 2 If not applicable chosen above: Choose an item. Explanation for 0 points (if required above):	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2	2
Total for D 6	4

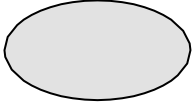
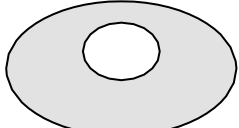
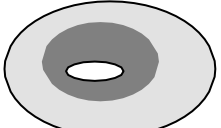
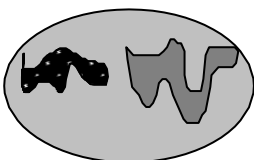
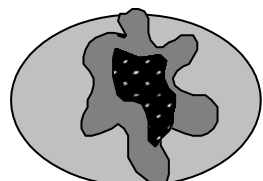
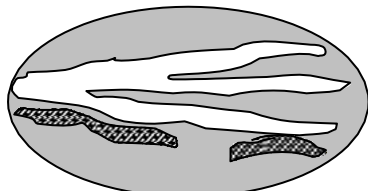
Rating of Value

If score is: 2–4 = H

Record the rating on the first page

COMMENTS: The Sultan Shoreline Master Program identifies this area as frequently flooded.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: <i>Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.</i> ☐ Aquatic bed ☒ Emergent ☐ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) <i>If the unit has a Forested class, check if:</i> ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1 structure points = 0	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (<i>see text for descriptions of hydroperiods</i>). ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☒ Saturated only ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ Lake Fringe wetland ☐ Freshwater tidal wetland	1 type present points = 0 2 points 2 points	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.</i> If you counted: <5 species points = 0		0

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i> Choose an item.  ✓ None = 0 points  Low = 1 point  Moderate = 2 points     All three diagrams in this row are HIGH = 3 points	0
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> ☐ 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 (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) ☐ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) ☒ 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>)	1
Total for H 1	1
Rating of Site Potential If score is: 0–6 = L <i>Record the rating on the first page</i>	
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat <u>7</u> + [(% moderate and low intensity land uses)/2] <u>23</u> = <u>30</u>% If total accessible habitat is: 20–33% of 1 km Polygon points = 2	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u>15</u> + [(% moderate and low intensity land uses)/2] <u>24.5</u> = <u>39.5</u>% Undisturbed habitat 10–50% and in 1–3 patches points = 2	2
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity points = 0	0
Total for H 2	4
Rating of Landscape Potential If score is: 4–6 = H <i>Record the rating on the first page</i>	

Wetland name or number W7

H 3.0. Is the habitat provided by the site valuable to society?

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.*

0

Site meets ANY of the following criteria:

points = 2

- ☐ It has 3 or more priority habitats within 100 m (see next page)
- ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)
- ☐ It is mapped as a location for an individual WDFW priority species
- ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources
- ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan

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

points = 1

✓ Site does not meet any of the criteria above

points = 0

Rating of Value

If score is: 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: <https://wdfw.wa.gov/species-habitats/at-risk/phs/list>).

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit:

NOTE: *This question is independent of the land use between the wetland unit and the priority habitat.*

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? - The dominant water regime is tidal, - Vegetated, and - With a salinity greater than 0.5 ppt Yes: Go to SC 1.1 ✓ No = Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No: Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? - The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of nonnative plant species. (If nonnative species are <i>Spartina</i>, see page 25) - At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. - The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. I Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes: Go to SC 2.2 No: Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I ✓ No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes: Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	Cat. I

Cat. II

Wetland name or number W7

SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i> 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	Cat I
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	Cat. II
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	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	Cat. IV
Category of wetland based on Special Characteristics If you answered No for all types, enter “Not Applicable” on Summary Form	NA

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Wetland name or number W8

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland 8 Date of site visit: 7/29/21, 12/15/21

Rated by D. Rapoza Trained by Ecology? ☒ Yes ☐ No Date of Training 10/2018

HGM Class used for rating depressional Wetland has multiple HGM classes? ☐ Yes ☒ No

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

Source of base aerial photo/map 2022 Google Earth

OVERALL WETLAND CATEGORY IV (based on functions ☒ or special characteristics ☐)

1. Category of wetland based on FUNCTIONS

Category IV – Total score = 9 – 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	L	M	L	
Landscape Potential	M	L	H	
Value	L	H	L	TOTAL
Score Based on Ratings	4	6	5	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	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	☒

Wetland name or number W8

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	C1
Hydroperiods	D 1.4, H 1.2	C2
Location of outlet (<i>can be added to map of hydroperiods</i>)	D 1.1, D 4.1	C2
Boundary of area within 150 ft of the wetland (<i>can be added to another figure</i>)	D 2.2, D 5.2	C2
Map of the contributing basin	D 4.3, D 5.3	C5
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	C6
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	C7
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	C7

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 types 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).

Wetland name or number W8

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
Choose an item.

*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 W8

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	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). 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 < 1/10 of area points = 0	0
D 1.4. Characteristics of seasonal ponding or inundation: <i>This is the area that is ponded for at least 2 months. See description in manual.</i> Area seasonally ponded is < 1/4 total area of wetland points = 0	0
Total for D 1	Add the points in the boxes above (F9 key) 3

Rating of Site Potential

If score is: 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? 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	1
D 2.3. Are there septic systems within 250 ft of the wetland? 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: No = 0	0
Total for D 2	Add the points in the boxes above 1

Rating of Landscape Potential

If score is: 1 or 2 = M

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? No = 0	0
D 3.2. Is the wetland in a basin or subbasin where an aquatic resource is on the 303(d) list? No = 0	0
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)? No = 0	0
Total for D 3	Add the points in the boxes above 0

Rating of Value

If score is: 0 = L

Record the rating on the first page

COMMENTS:

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	4
D 4.2. <u>Depth of storage during wet periods:</u> 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 less than 0.5 ft (6 in) points = 0	0
D 4.3. <u>Contribution of the wetland to storage in the watershed:</u> 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 10 to 100 times the area of the unit points = 3	3
Total for D 4	7

Rating of Site Potential

If score is: 6–11 = M

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? No = 0	0
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? No = 0	0
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.)? No = 0	0
Total for D 5	0

Rating of Landscape Potential

If score is: 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 subbasin that is immediately down-gradient of unit points = 2 If not applicable chosen above: Choose an item. Explanation for 0 points (if required above):	2
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2	2
Total for D 6	4

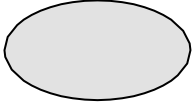
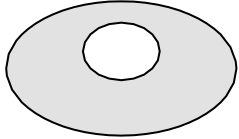
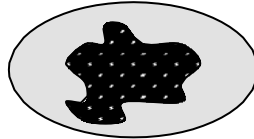
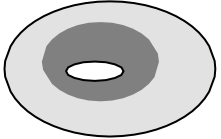
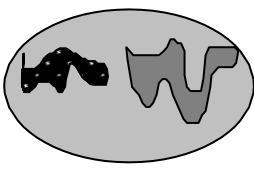
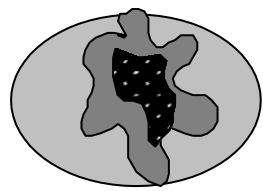
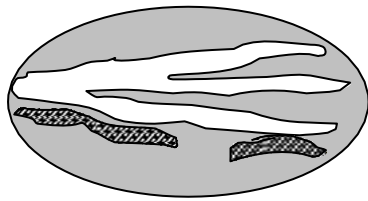
Rating of Value

If score is: 2–4 = H

Record the rating on the first page

COMMENTS: The Sultan Shoreline Master Program identifies this area as frequently flooded.

These questions apply to wetlands of all HGM classes. HABITAT FUNCTIONS – Indicators that site functions to provide important habitat		
H 1.0. Does the site have the potential to provide habitat?		
H 1.1. Structure of plant community: <i>Indicators are Cowardin classes and strata within the Forested class. Check the Cowardin plant classes in the wetland. Up to 10 patches may be combined for each class to meet the threshold of 1/4 ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.</i> ☐ Aquatic bed ☒ Emergent ☐ Scrub-shrub (areas where shrubs have >30% cover) ☐ Forested (areas where trees have >30% cover) <i>If the unit has a Forested class, check if:</i> ☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1 structure points = 0	0
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 ac to count (<i>see text for descriptions of hydroperiods</i>). ☐ Permanently flooded or inundated ☐ Seasonally flooded or inundated ☐ Occasionally flooded or inundated ☒ Saturated only ☐ Permanently flowing stream or river in, or adjacent to, the wetland ☐ Seasonally flowing stream in, or adjacent to, the wetland ☐ Lake Fringe wetland ☐ Freshwater tidal wetland	1 type present points = 0 2 points 2 points	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². <i>Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle.</i> If you counted: <5 species points = 0		0

H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. <i>If you have four or more plant classes or three classes and open water, the rating is always high.</i> Choose an item.  ✓ None = 0 points  Low = 1 point  Moderate = 2 points     All three diagrams in this row are HIGH = 3 points	0
H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> ☐ 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 (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) ☐ At least 1/4 ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) ☐ 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>)	0
Total for H 1	0
Rating of Site Potential If score is: 0–6 = L <i>Record the rating on the first page</i>	
H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat <u>7</u> + [(% moderate and low intensity land uses)/2] <u>23</u> = <u>30</u>% If total accessible habitat is: 20–33% of 1 km Polygon points = 2	2
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u>15</u> + [(% moderate and low intensity land uses)/2] <u>24.5</u> = <u>39.5</u>% Undisturbed habitat 10–50% and in 1–3 patches points = 2	2
H 2.3. Land use intensity in 1 km Polygon: If ≤50% of 1 km Polygon is high intensity points = 0	0
Total for H 2	4
Rating of Landscape Potential If score is: 4–6 = H <i>Record the rating on the first page</i>	

Wetland name or number W8

H 3.0. Is the habitat provided by the site valuable to society?

H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.*

0

Site meets ANY of the following criteria:

points = 2

- ☐ It has 3 or more priority habitats within 100 m (see next page)
- ☐ It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)
- ☐ It is mapped as a location for an individual WDFW priority species
- ☐ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources
- ☐ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan

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

points = 1

✓ Site does not meet any of the criteria above

points = 0

Rating of Value

If score is: 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: <https://wdfw.wa.gov/species-habitats/at-risk/phs/list>).

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit:

NOTE: *This question is independent of the land use between the wetland unit and the priority habitat.*

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i> SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? - The dominant water regime is tidal, - Vegetated, and - With a salinity greater than 0.5 ppt Yes: Go to SC 1.1 ✓ No = Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No: Go to SC 1.2	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? - The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of nonnative plant species. (If nonnative species are <i>Spartina</i>, see page 25) - At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. - The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = Category I No = Category II	Cat. I Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes: Go to SC 2.2 No: Go to SC 2.3 SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = Category I ✓ No = Not a WHCV SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes: Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes = Category I No = Not a WHCV	Cat. I

SC 3.0. Bogs

Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below. If you answer YES, you will still need to rate the wetland based on its functions.*

SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?

Yes – Go to **SC 3.3** ✓ No – Go to **SC 3.2**

SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?

Yes – Go to **SC 3.3** ✓ No = **Is not a bog**

SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4**

NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.

SC 3.4. Is an area with peats or mucks forested (>30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?

Yes = Is a Category I bog No = Is not a bog

Cat. I

SC 4.0. Forested Wetlands

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

- **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.
- **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80–200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).

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

Cat. I

SC 5.0. Wetlands in Coastal Lagoons

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

- The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks
- The lagoon in which the wetland is located contains ponded water that is saline or brackish (>0.5 ppt) during most of the year in at least a portion of the lagoon (*needs to be measured near the bottom*)

Yes – Go to **SC 5.1** ✓ No = **Not a wetland in a coastal lagoon**

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

- The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).
 - At least 3/4 of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland.
 - The wetland is larger than 1/10 ac (4350 ft²)
- Yes = **Category I** No = **Category II**

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

Cat. I

Cat. II

Wetland name or number W8

SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i> 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	Cat I
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	Cat. II
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	Cat. III
SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV	Cat. IV
Category of wetland based on Special Characteristics If you answered No for all types, enter “Not Applicable” on Summary Form	NA

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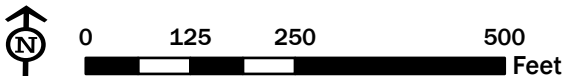
Legend

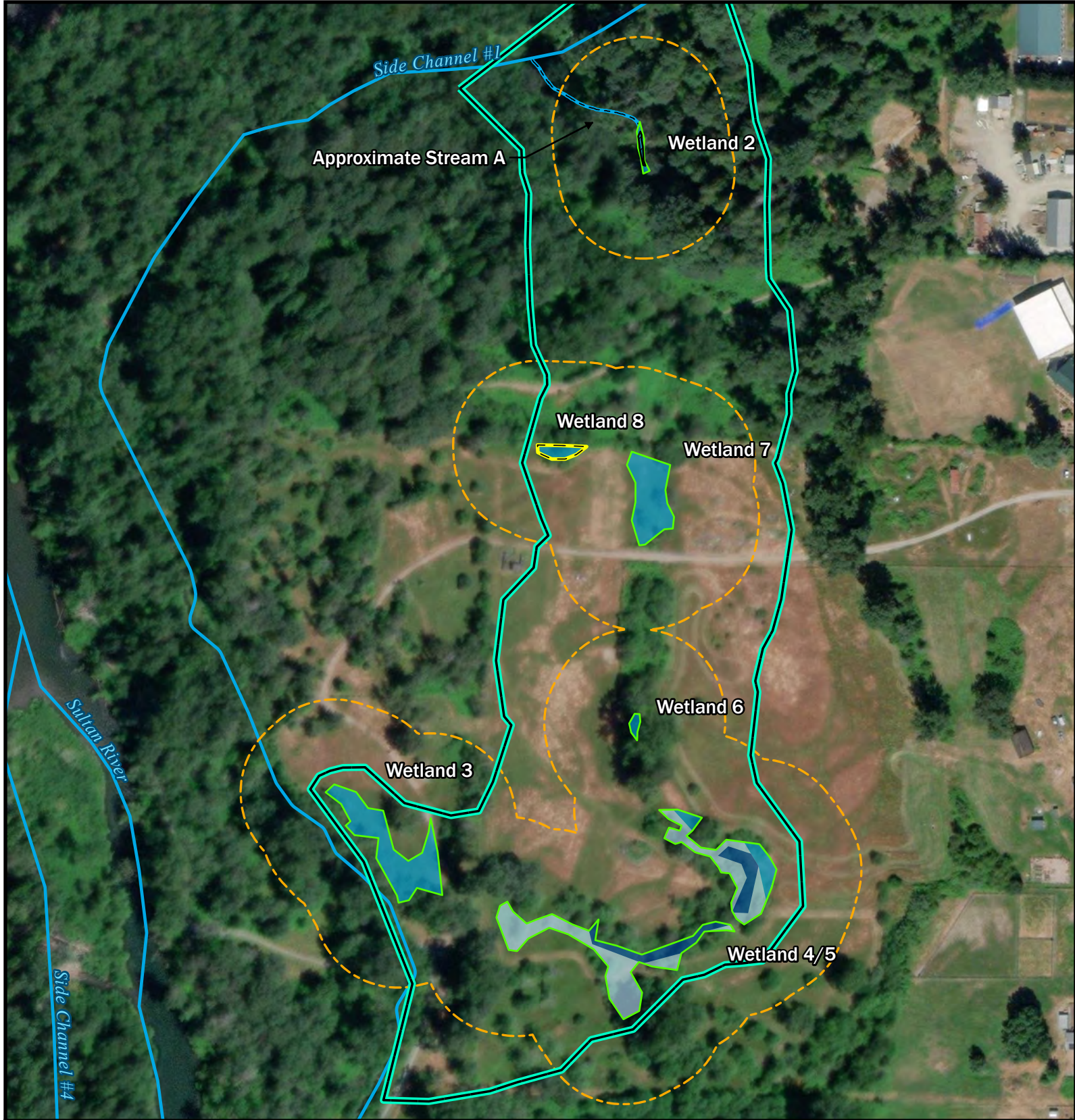
Cowardin Class

- PEM - Palustrine emergent
- PFO - Palustrine forested
- PSS - Palustrine scrub-shrub
- Delineated Wetland Boundary
- Estimated Wetland Boundary

- Rivers and Streams
- Study Area
- Culvert
- Unvegetated

Figure C-1.
Cowardin Class.





Legend

Hydroperiod

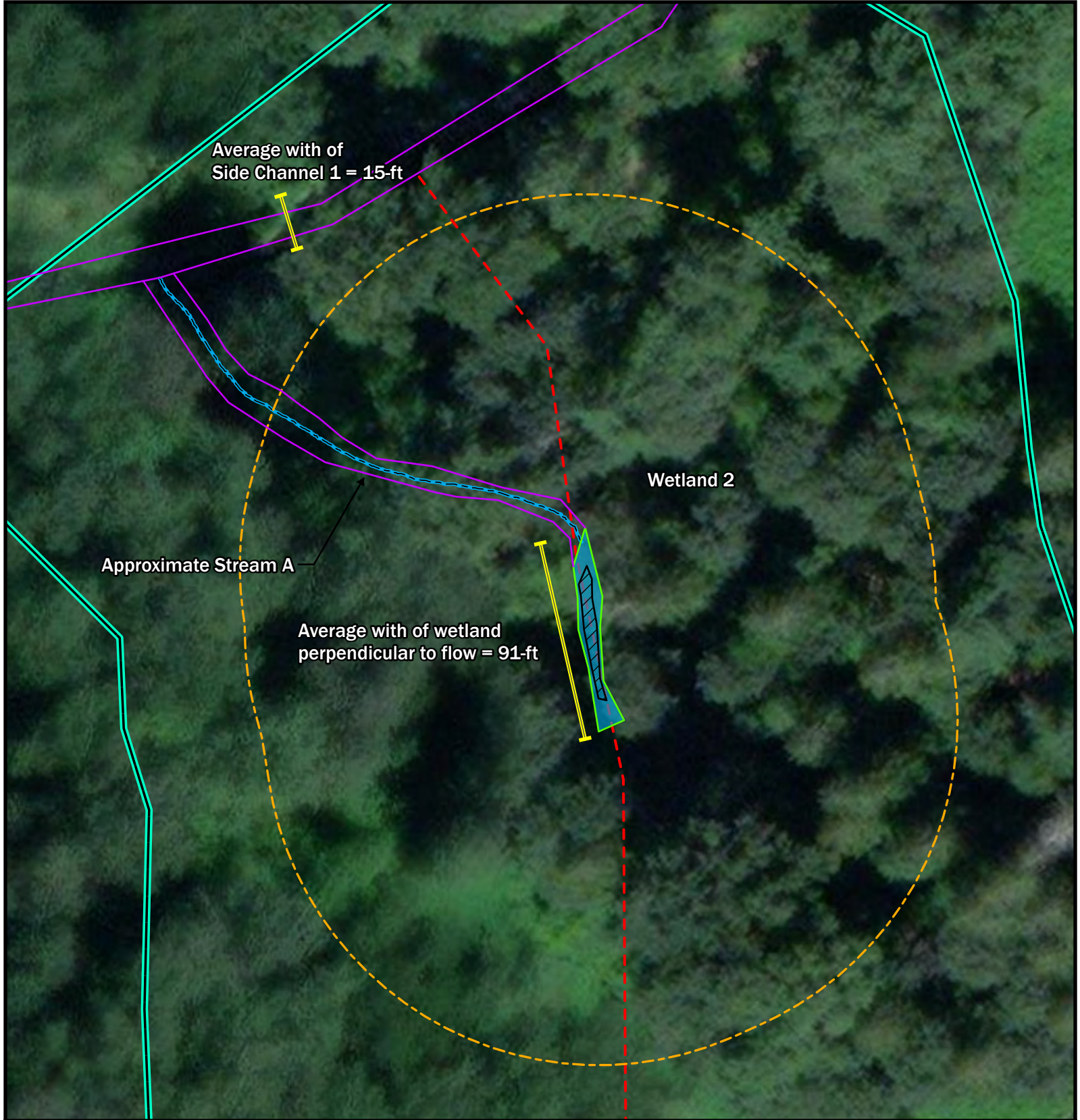
- Permanently Inundated
- Saturated
- Seasonally Inundated
- Delineated Wetland Boundary
- Estimated Wetland Boundary

- Rivers and Streams
- Approximate Stream A
- Study Area
- Ponded Depression
- Wetland 150-foot Boundary

Figure C-2.
Hydroperiod and 150-Foot Boundary.



K:\Projects\Y2020\20-07466-001\Pro\Sultan_River_Side_Channel_Inlet\Sultan_River_Side_Channel_Inlet.aprx\Rating_FigC2_Hydroperiod



Legend

Hydroperiod

 Saturated

 Delineated Wetland Boundary

 Approximate Stream A

 Historic Side Channel

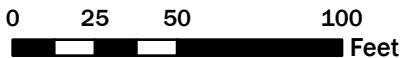
 Approximate OHWM

 Study Area

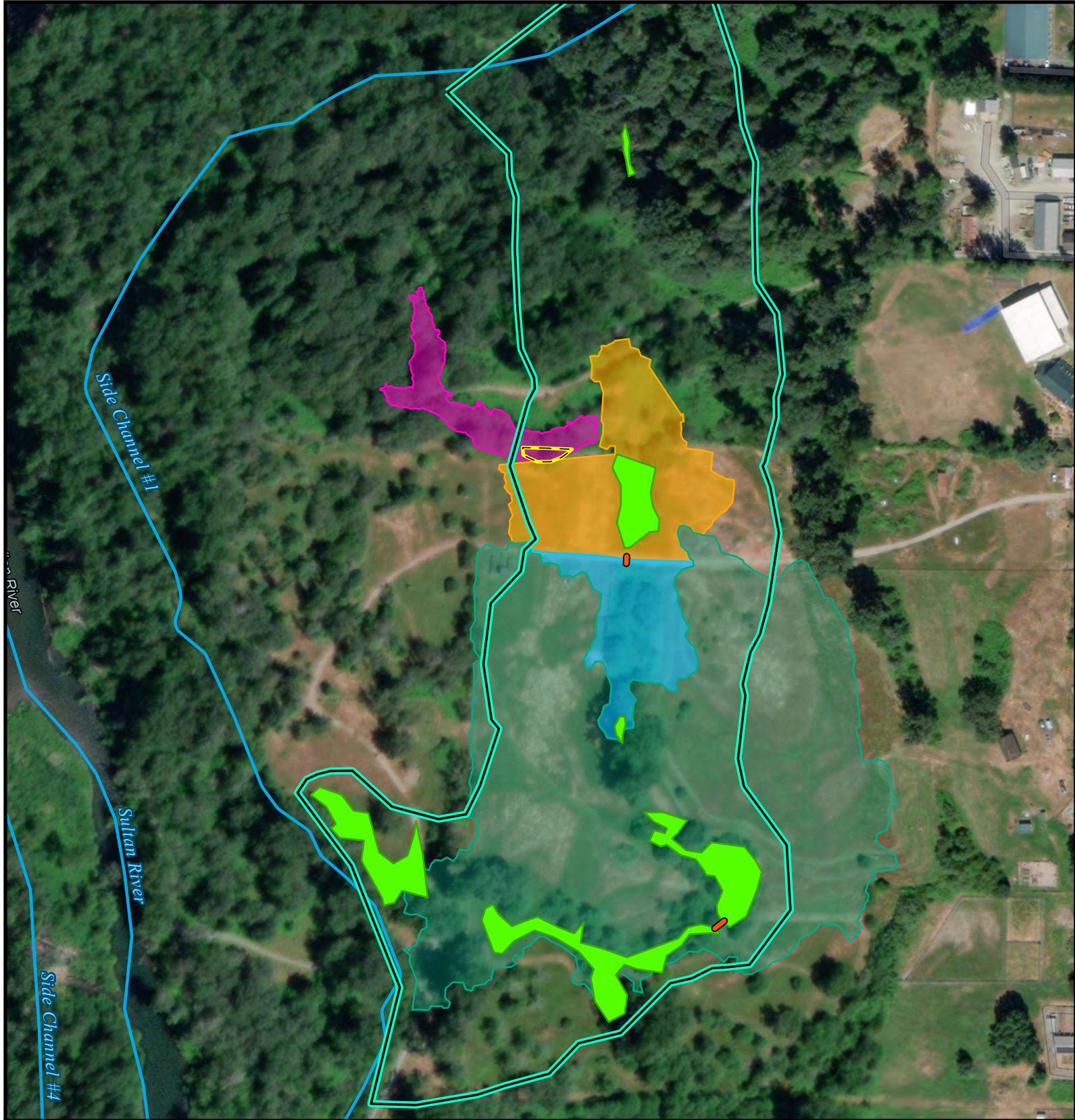
 Ponded Depression

 Wetland 150-ft Boundary

Figure C-3.
Hydroperiod and 150-Foot Boundary for
Wetland 2.



Esri Imagery (2022)



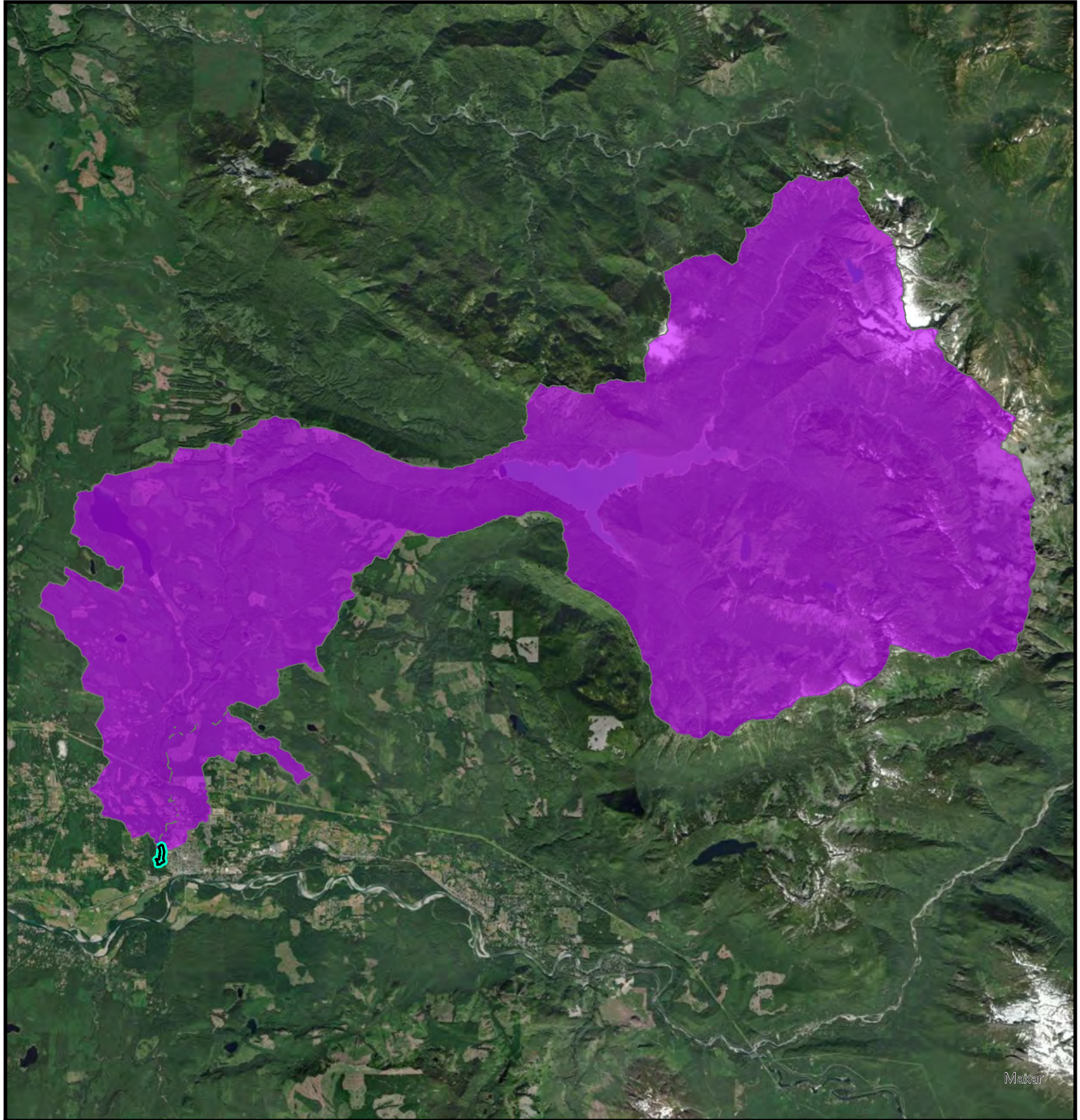
Legend

- | | |
|---|--|
|  Contributing Basin - Wetland 4/5 |  Estimated Wetland Boundary |
|  Contributing Basin - Wetland 6 |  Study Area |
|  Contributing Basin - Wetland 7 |  Rivers and Streams |
|  Contributing Basin - Wetland 8 |  Culvert |
|  Delineated Wetland Boundary | |

Figure C-4.
Contributing Basin for Wetlands.



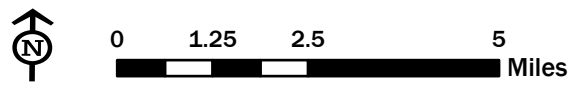
Snohomish County, Esri Imagery (2022)

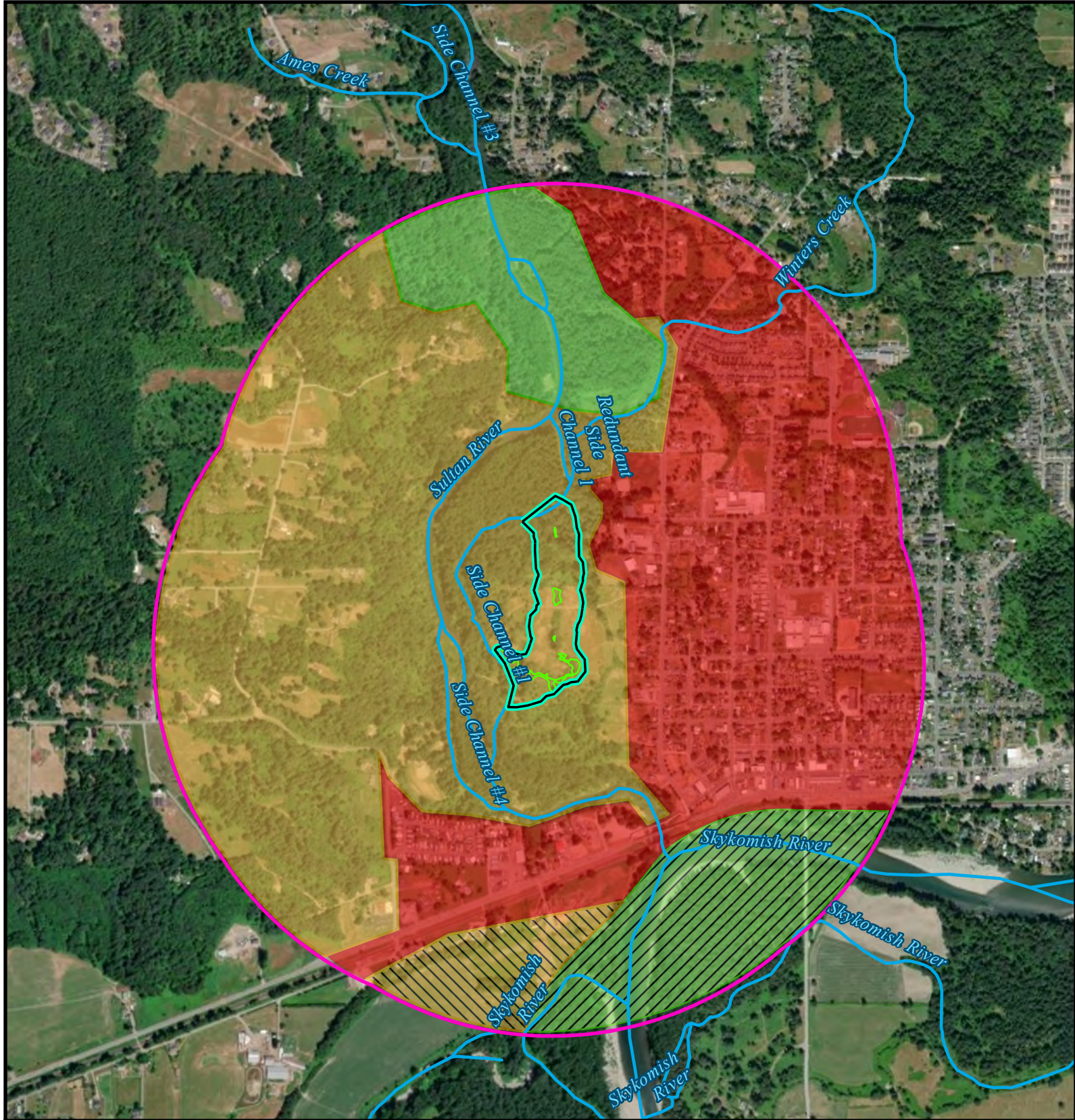


Legend

-  Contributing Basin - Wetland 2
-  Study Area

Figure C-5.
Contributing Basin for Wetland 2.





Legend

- | | |
|---------------------------------------|-----------------------------|
| Habitat Type | Study Area |
| High Intensity | Rivers and Streams |
| Moderate/Low Intensity - Accessible | Delineated Wetland Boundary |
| Relatively Undisturbed - Accessible | Wetland Buffer - 1 km |
| Moderate/Low - Inaccessible | |
| Relatively Undisturbed - Inaccessible | |

Figure C-6.
Habitat in 1-km Buffer of Wetlands.



Snohomish River
Tributaries
Bacteria TMDL

Legend

-  Study Area
-  303(d) Listed Waters - The nearest 303(d) listed water is approximately 3.62 miles from the project area.
-  TMDL Boundary

Figure C-7.
TMDL Boundaries and 303(d) Listed Waters
in the Vicinity.



WA Department of Ecology, Esri Imagery (2022)

APPENDIX D

NRCS Soil Report





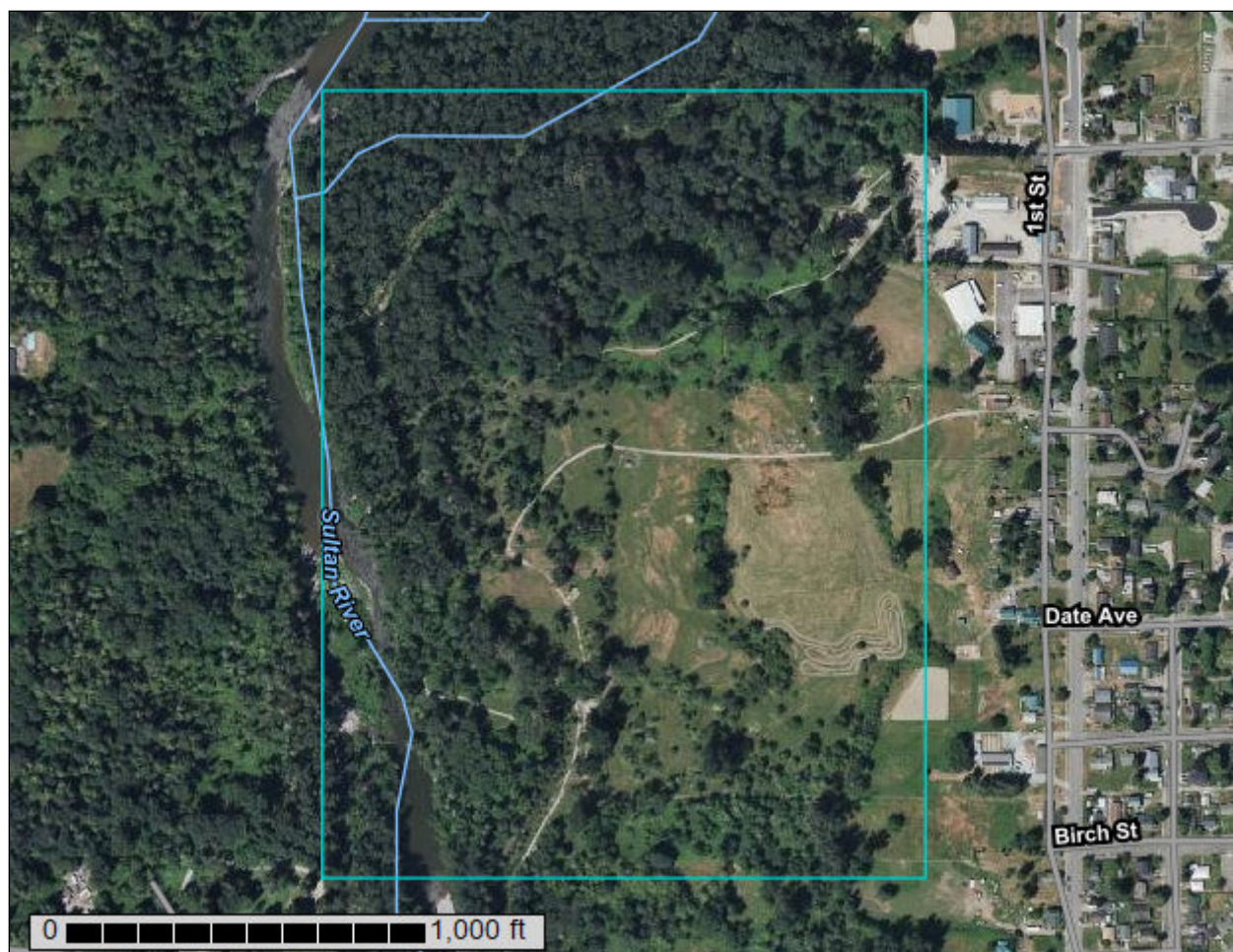
United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for **Snohomish County Area, Washington**



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

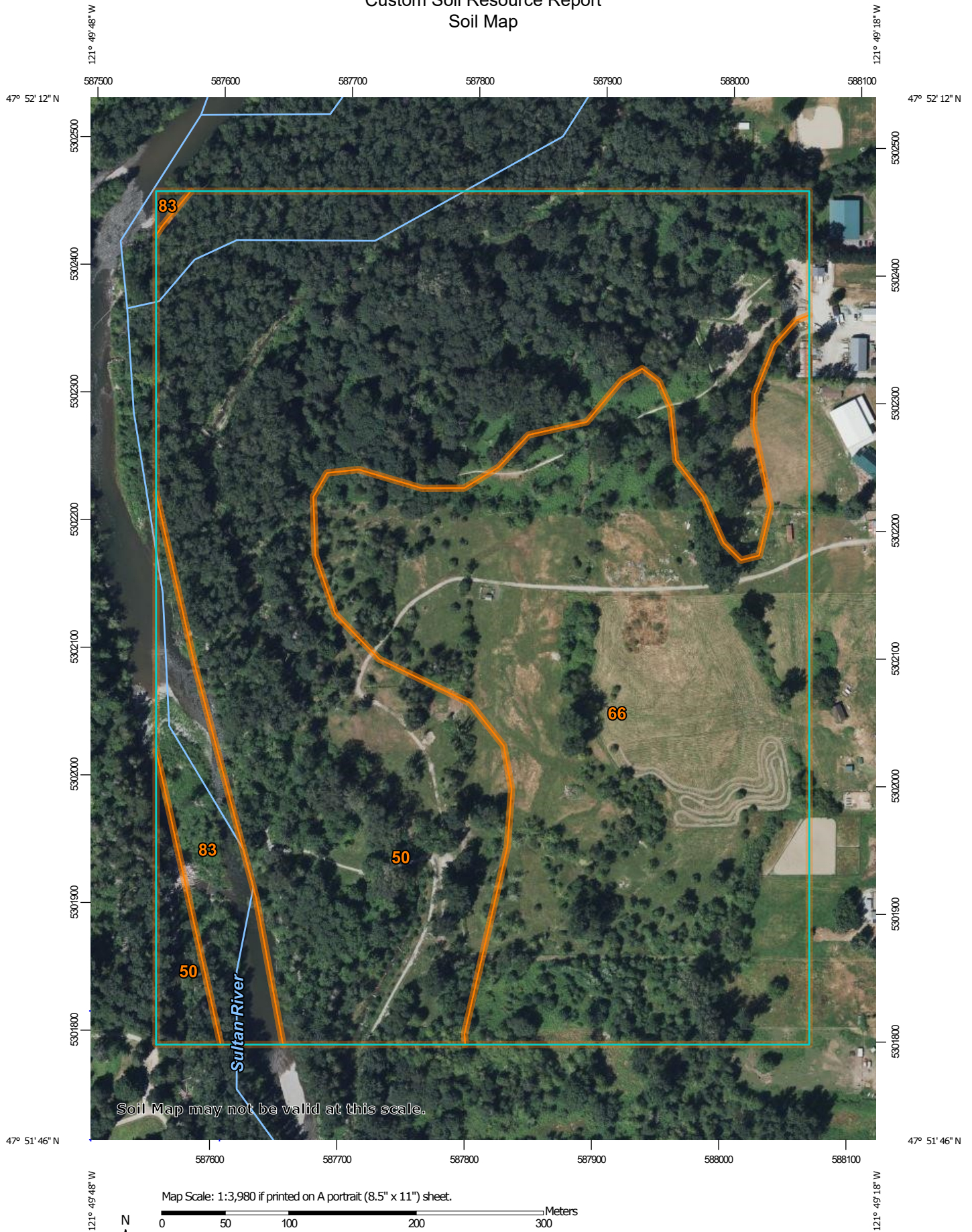
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Custom Soil Resource Report

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Snohomish County Area, Washington
Survey Area Data: Version 24, Sep 8, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2020—Aug 17, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
50	Pilchuck loamy sand	46.4	54.5%
66	Sultan silt loam	34.6	40.6%
83	Water	4.2	4.9%
Totals for Area of Interest		85.1	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Snohomish County Area, Washington

50—Pilchuck loamy sand

Map Unit Setting

National map unit symbol: 2hzb

Elevation: 0 to 980 feet

Mean annual precipitation: 35 to 60 inches

Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 160 to 210 days

Farmland classification: Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season

Map Unit Composition

Pilchuck and similar soils: 85 percent

Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pilchuck

Setting

Landform: Flood plains

Parent material: Alluvium

Typical profile

H1 - 0 to 31 inches: loamy sand

H2 - 31 to 50 inches: fine sand

H3 - 50 to 60 inches: gravelly sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)

Depth to water table: About 24 to 48 inches

Frequency of flooding: FrequentNone

Frequency of ponding: None

Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A

Ecological site: F002XA008WA - Puget Lowlands Riparian Forest

Forage suitability group: Droughty Soils (G002XN402WA)

Other vegetative classification: Droughty Soils (G002XN402WA)

Hydric soil rating: No

Minor Components

Puget, undrained

Percent of map unit: 5 percent

Landform: Flood plains

Other vegetative classification: Wet Soils (G002XN102WA)

Hydric soil rating: Yes

66—Sultan silt loam

Map Unit Setting

National map unit symbol: 2hzw
Elevation: 0 to 820 feet
Mean annual precipitation: 35 to 55 inches
Mean annual air temperature: 50 degrees F
Frost-free period: 150 to 200 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Sultan and similar soils: 85 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sultan

Setting

Landform: Flood plains
Parent material: Alluvium

Typical profile

H1 - 0 to 12 inches: ashy silt loam
H2 - 12 to 42 inches: silty clay loam
H3 - 42 to 60 inches: stratified sand to silt loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 24 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: High (about 10.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3w
Hydrologic Soil Group: C
Ecological site: F002XA005WA - Puget Lowlands Moist Forest
Forage suitability group: Seasonally Wet Soils (G002XN202WA)
Other vegetative classification: Seasonally Wet Soils (G002XN202WA)
Hydric soil rating: No

Minor Components

Puget, undrained

Percent of map unit: 5 percent

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Landform: Flood plains

Other vegetative classification: Wet Soils (G002XN102WA)

Hydric soil rating: Yes

83—Water

Map Unit Composition

Water: 100 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

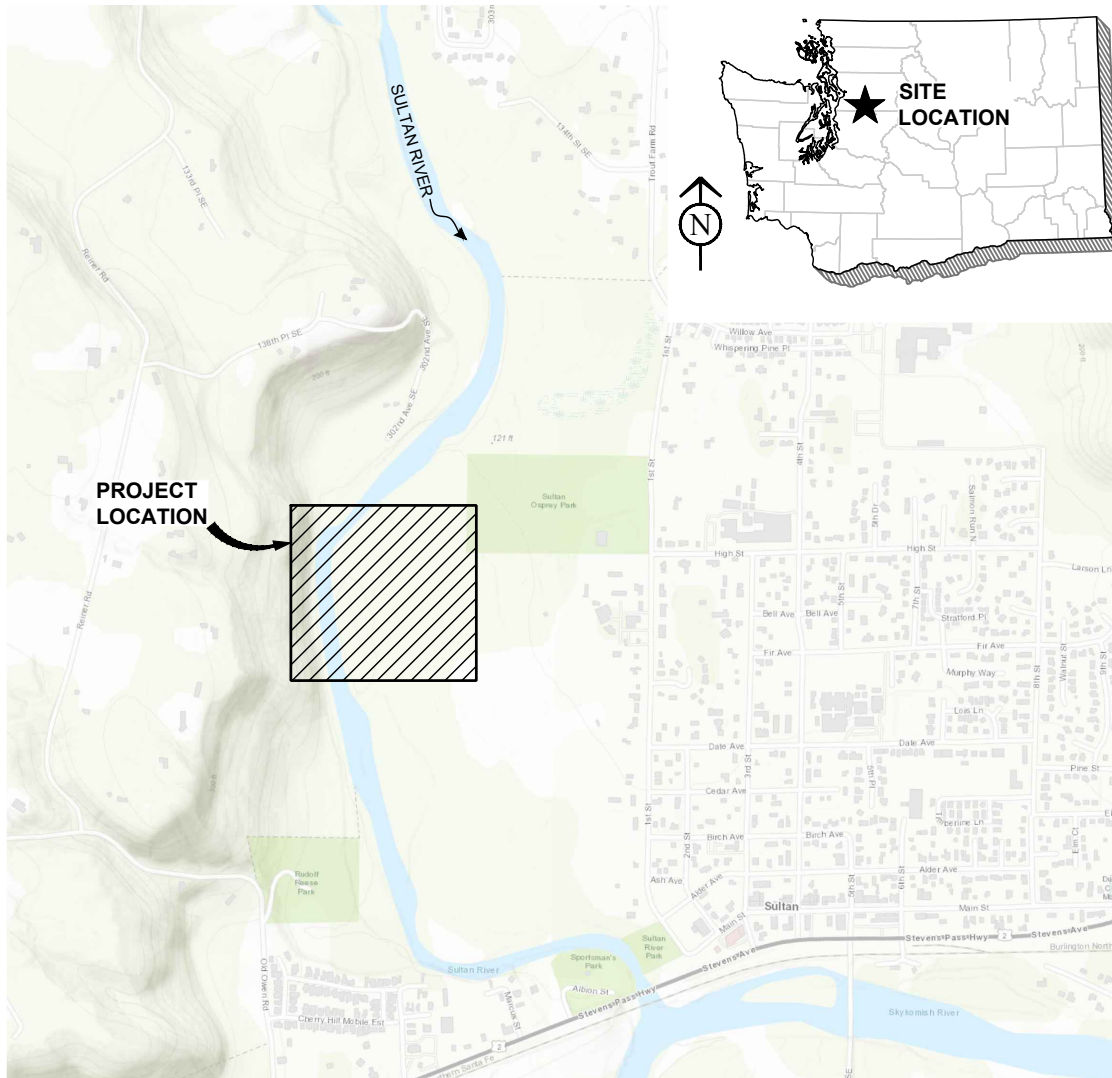
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APPENDIX E

JARPA Drawings





VICINITY MAP

SCALE: 1"=1/4 MILE

DRAWING SHEET INDEX	
SHEET NO.	SHEET TITLE
1	VICINITY MAP AND SHEET INDEX
2	LEGEND AND ABBREVIATIONS
3	PROJECT AREA AND PARCEL MAP
4	EXISTING CONDITIONS
5	PROPOSED GRADING, TESC AND SITE ACCESS PLAN
6	SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 0+00 - 5+00
7	SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 5+00 - 10+00
8	SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 10+00 - 15+00
9	SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 15+00 - 18+91
10	PLANTING SCHEDULE AND NOTES
11	PLANTING DETAILS - 1 OF 2
12	PLANTING DETAILS - 2 OF 2



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VICINITY MAP AND SHEET INDEX

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
 VERTICAL DATUM: NAVD 88
 PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1 EXTENSION

APPLICANT:



SNOHOMISH PUBLIC UTILITIES DISTRICT 1
 ATTN: KEITH M. BINKLEY, MANAGER OF NATURAL RESOURCES
 P.O. BOX 1107, EVERETT, WA 09201
 PHONE: 425-783-1769
 KMBINKLEY@SNOPUD.COM

FIGURE

1

STATE: WASHINGTON
 COUNTY: SNOHOMISH
 CITY: SULTAN
 LOCATION: S31 T28N R8E
 WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
 SHEET: 1 OF 12 DATE: JULY 2023

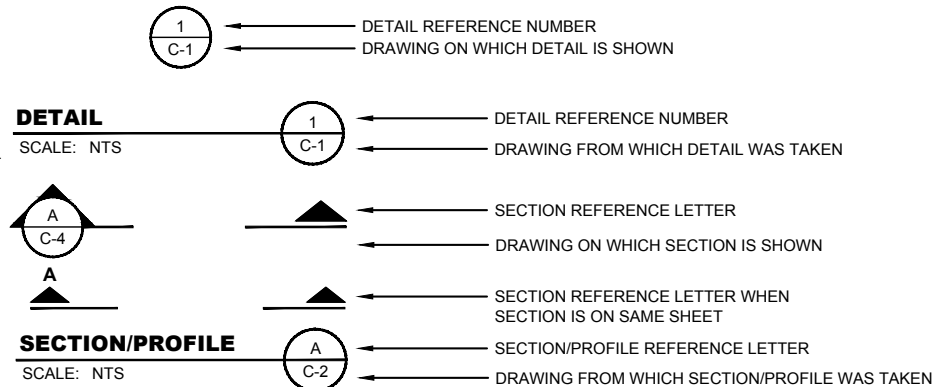
ABBREVIATIONS

APPROX	APPROXIMATE
CB	CATCH BASIN
CG	CLEAR AND GRUB
C/L, CL	CENTERLINE
COMM	COMMUNICATION
CONST	CONSTRUCT, CONSTRUCTION
DWG	DRAWING
E	EAST, EASTING
EA	EACH
EL	ELEVATION
ELS	ENGINEERED LOG STRUCTURE
EX	EXISTING
FT	FEET/FOOT
HOR	HORIZONTAL
HT	HEIGHT
IN	INCH/INCHES
L	LENGTH
LF	LINEAL FOOT/FEET
LT	LEFT
MAX	MAXIMUM
MIN	MINIMUM
N	NORTH/NORTHING
NA	NOT APPLICABLE
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OHW	ORDINARY HIGH WATER
P	POWER
QTY	QUANTITY
RD	ROAD
ROW	RIGHT-OF-WAY
RT	RIGHT
SPEC	SPECIFICATION
SR	STATE ROUTE
SS	SANITARY SEWER
ST	STREET
STA	STATION
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
TYP	TYPICAL
W	WEST, WATER
WSE	WATER SURFACE ELEVATION

LEGEND - PROPOSED

	PARCEL LINE
	PROJECT LIMITS
	WETLAND BUFFER
	STUDY AREA
	ORDINARY HIGH WATER
	APPROXIMATE STREAM/RIVER CENTERLINE
	APPROXIMATE HISTORIC CHANNEL CENTERLINE
	HI-VISIBILITY FENCE
	BULK BAG
	CONSTRUCTION STAGING AREA
	WETLAND
	FOREST RIPARIAN PLANTING ZONE (67,499 SQ FT)
	SCRUB / SHRUB WETLAND PLANTINGS (2,892 SQ FT)
	FOREST UNDERSTORY RIPARIAN PLANTINGS (53,659 SQ FT)
	STREAM FORD WITH 4 - 8" COBBLES
	ENGINEERED LOG STRUCTURE

NOTE AND DETAIL/SECTION REFERENCING



"-" INDICATES THAT THE DETAIL/SECTION IS SHOWN ON THE SAME SHEET

"TYP" INDICATES THAT THE DETAIL/SECTION IS UNIFORMLY TYPICAL THROUGHOUT PROJECT EXCEPT WHERE OTHERWISE NOTED

"VAR" SPECIFIES THAT DETAIL/SECTION WAS TAKEN FROM VARIOUS DRAWINGS



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LEGEND AND ABBREVIATIONS

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1 EXTENSION

APPLICANT:



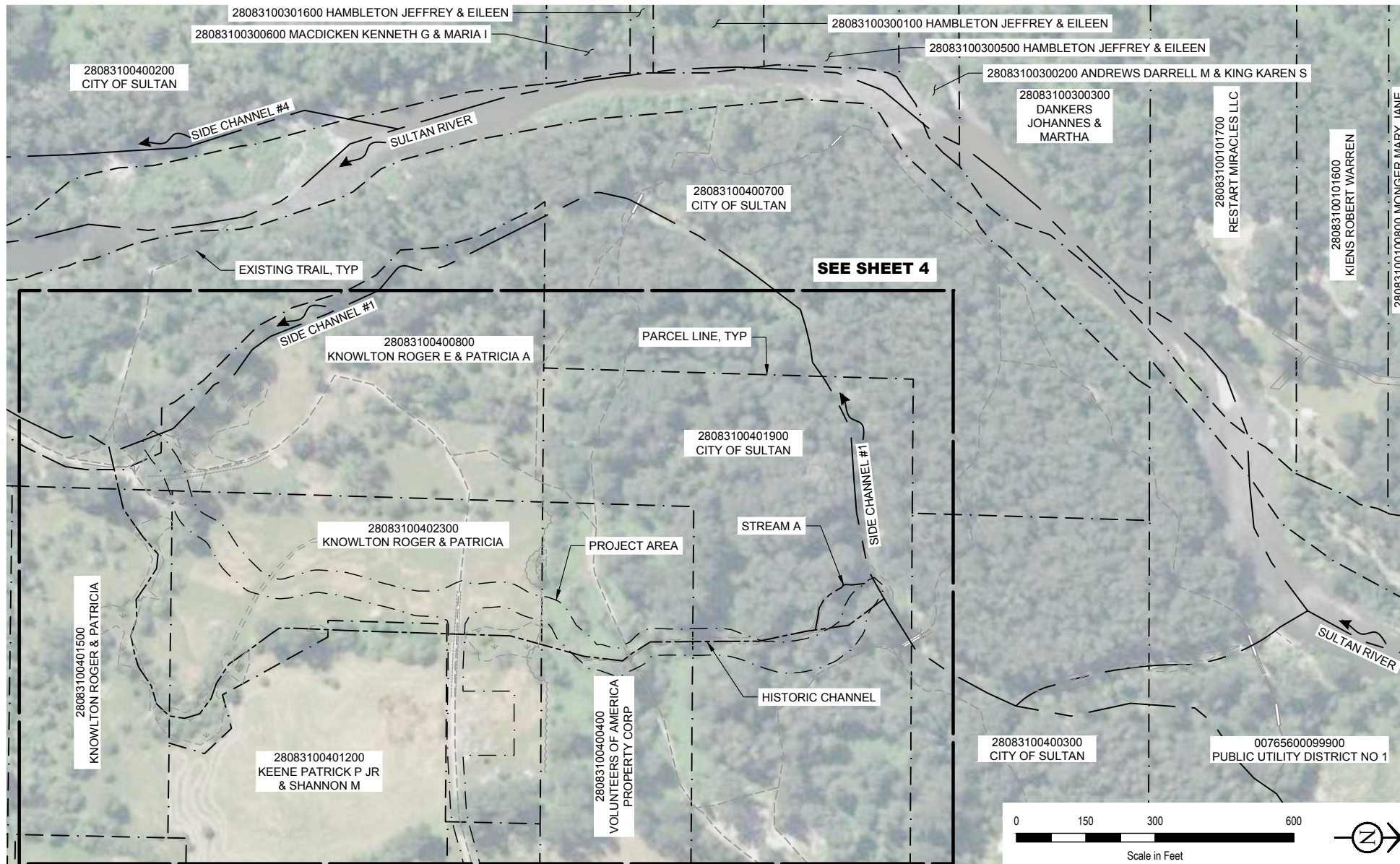
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PHONE: 425-783-1769
KMBINKLEY@SNOPUD.COM

FIGURE

2

STATE: WASHINGTON
COUNTY: SNOHOMISH
CITY: SULTAN
LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 2 OF: 12 DATE: JULY 2023



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PROJECT AREA AND PARCEL MAP

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
 VERTICAL DATUM: NAVD 88
 PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1 EXTENSION

APPLICANT:



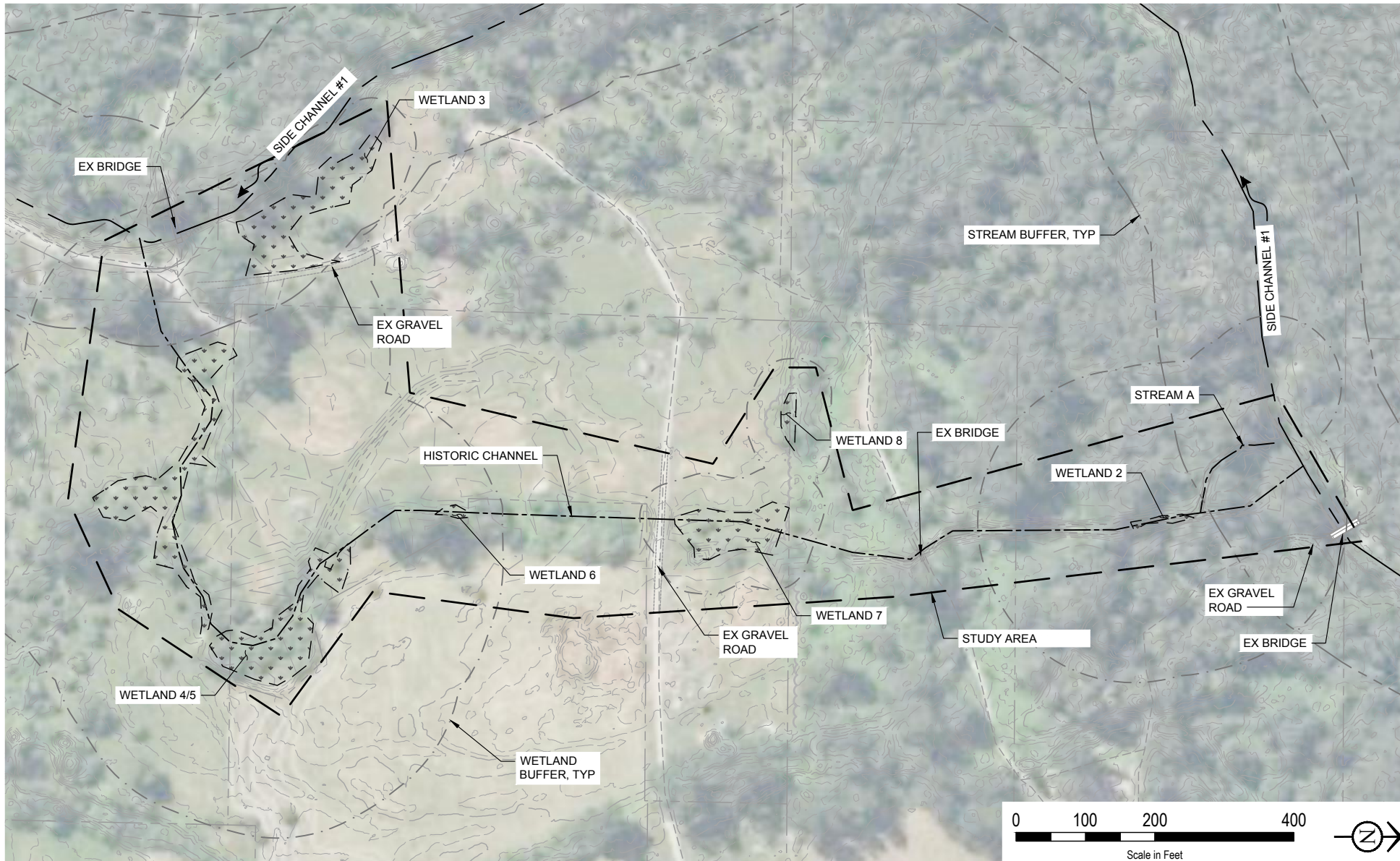
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 PHONE: 425-783-1769
 KMBINKLEY@SNOPUD.COM

FIGURE

3

STATE: WASHINGTON
 COUNTY: SNOHOMISH
 CITY: SULTAN
 LOCATION: S31 T28N R8E
 WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
 SHEET: 3 OF: 12 DATE: JULY 2023



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EXISTING CONDITIONS

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
 VERTICAL DATUM: NAVD 88
 PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1
 EXTENSION

APPLICANT:



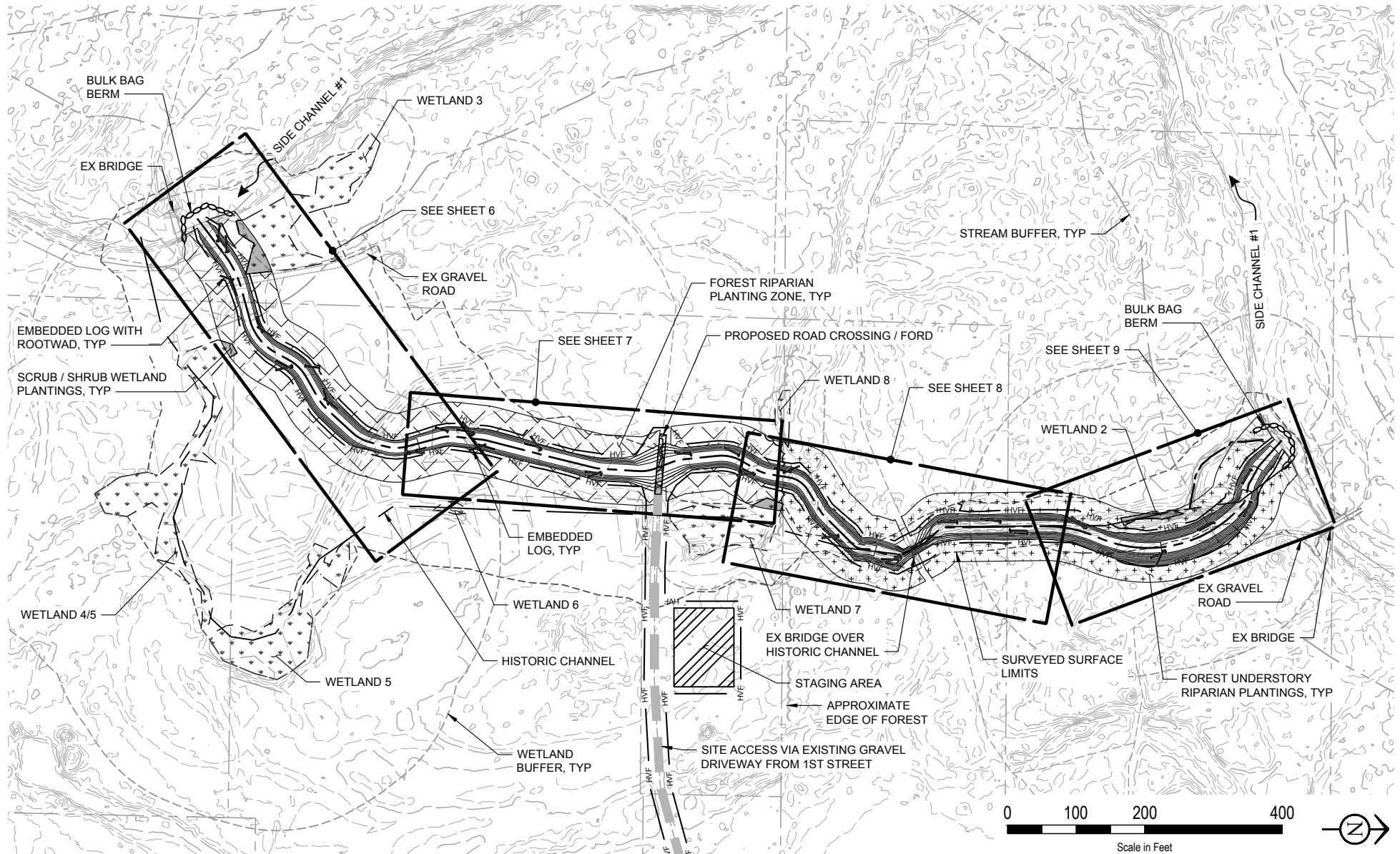
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 PHONE: 425-783-1769
 KMBINKLEY@SNOPUD.COM

FIGURE

4

STATE: WASHINGTON
 COUNTY: SNOHOMISH
 CITY: SULTAN
 LOCATION: S31 T28N R8E
 WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
 SHEET: 4 OF: 12 DATE: JULY 2023



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PROPOSED GRADING, TESC AND SITE ACCCESS PLAN

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1
EXTENSION

APPLICANT:



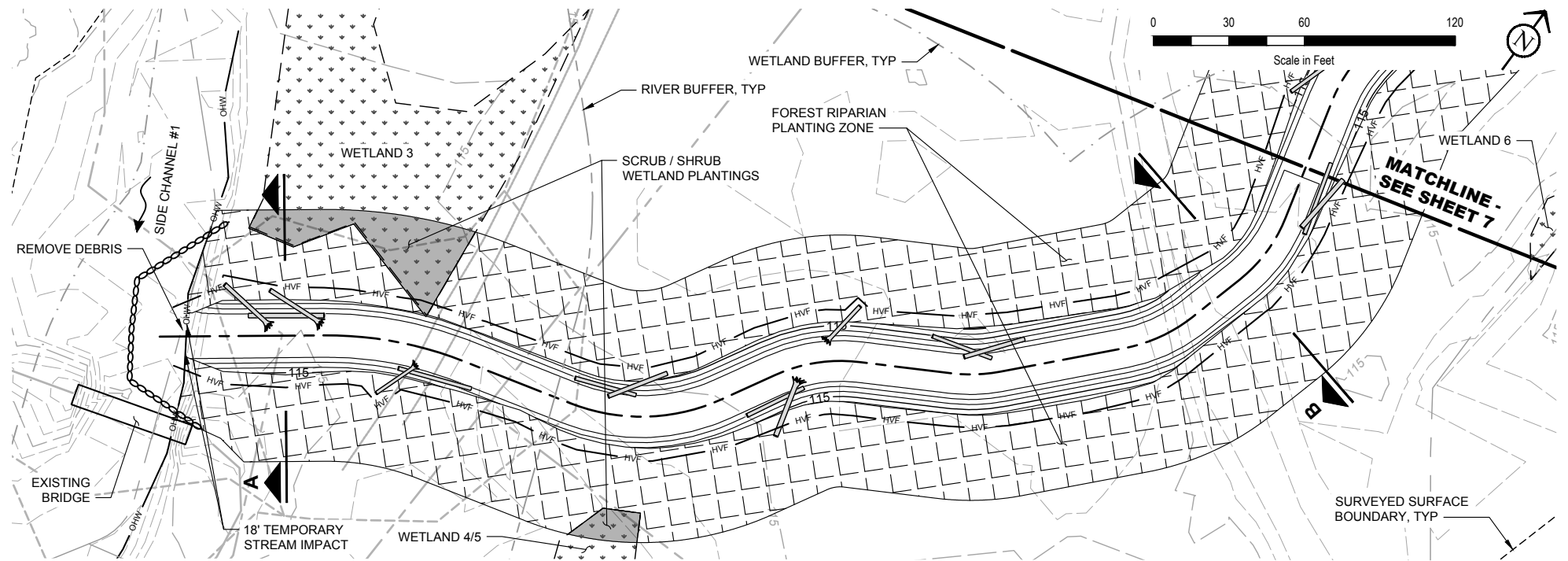
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FIGURE

5

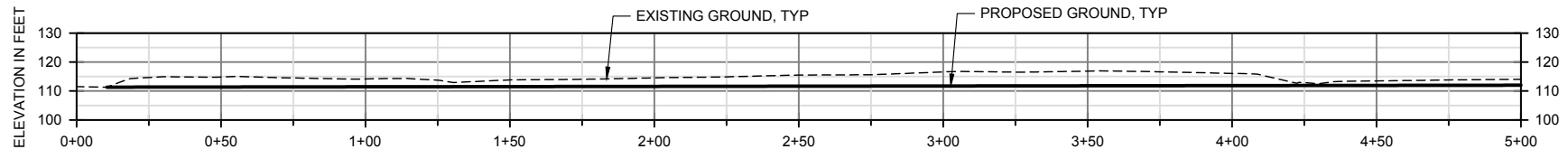
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COUNTY: SNOHOMISH
CITY: SULTAN
LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 5 OF: 12 DATE: JULY 2023



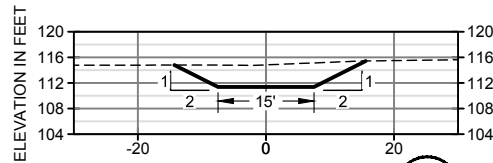
PLAN - SIDE CHANNEL - STA 0+00 - 5+00

SCALE: 1"=60'



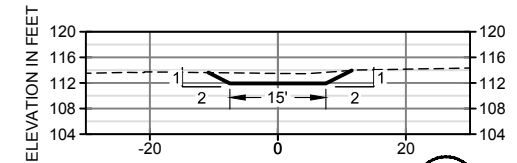
PROFILE - SIDE CHANNEL - STA 0+00 - 5+00

HORIZ. SCALE: 1"=60'
VERT. SCALE: 1"=60'



SECTION - STA 0+50

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



SECTION - STA 4+50

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



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SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 0+00 - 5+00

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1
EXTENSION

APPLICANT:



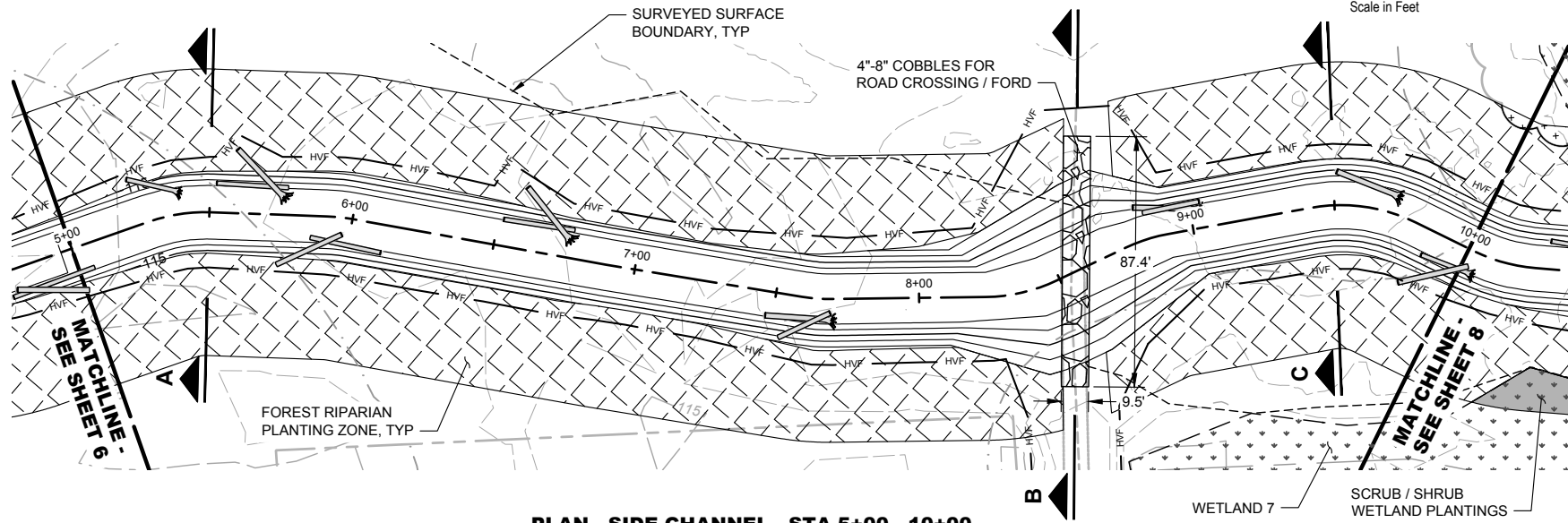
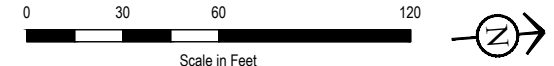
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P.O. BOX 1107, EVERETT, WA 98201
PHONE: 425-783-1769
KMBINKLEY@SNOPUD.COM

FIGURE

6

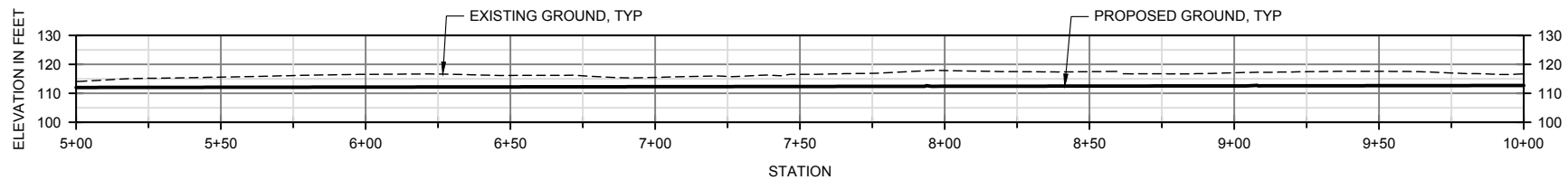
STATE: WASHINGTON
COUNTY: SNOHOMISH
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LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 6 OF: 12 DATE: JULY 2023



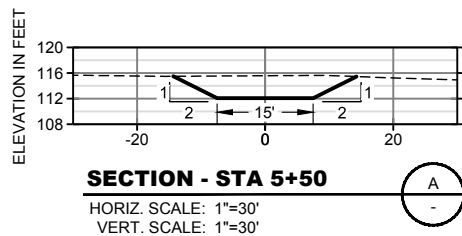
PLAN - SIDE CHANNEL - STA 5+00 - 10+00

SCALE: 1"=60'



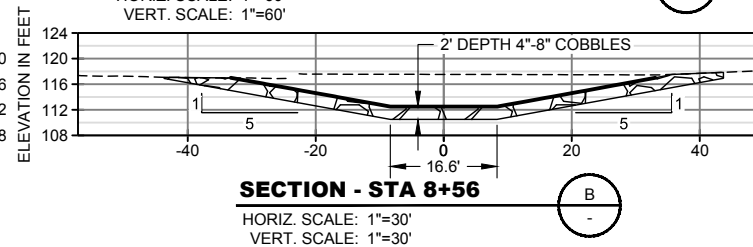
PROFILE - SIDE CHANNEL - STA 5+00 - 10+00

HORIZ. SCALE: 1"=60'
VERT. SCALE: 1"=60'



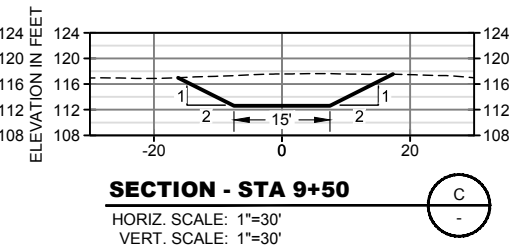
SECTION - STA 5+50

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



SECTION - STA 8+56

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



SECTION - STA 9+50

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



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SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 5+00 - 10+00

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1
EXTENSION

APPLICANT:



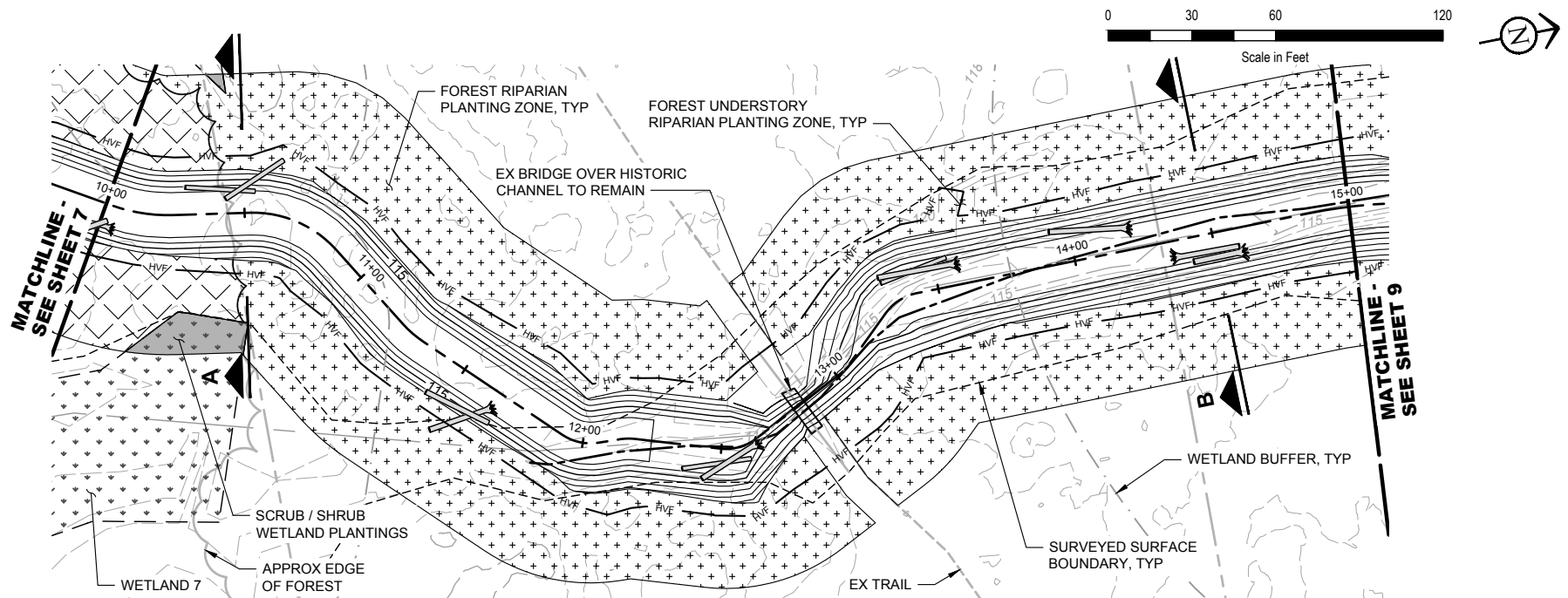
SNOHOMISH PUBLIC UTILITIES DISTRICT 1
ATTN: KEITH M. BINKLEY, MANAGER OF NATURAL RESOURCES
P.O. BOX 1107, EVERETT, WA 98201
PHONE: 425-783-1769
KMBINKLEY@SNOPUD.COM

FIGURE

7

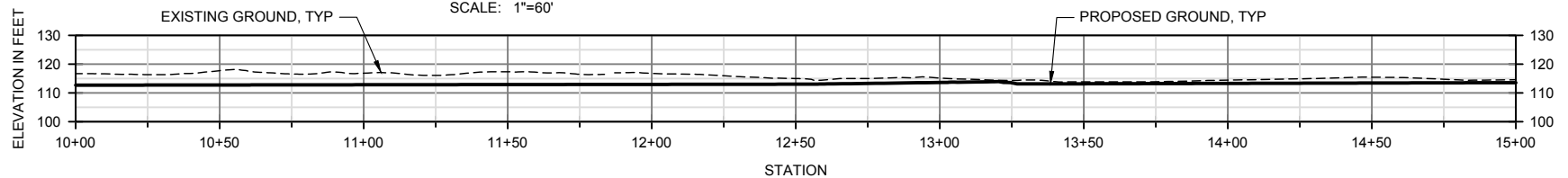
STATE: WASHINGTON
COUNTY: SNOHOMISH
CITY: SULTAN
LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 7 OF: 12 DATE: JULY 2023



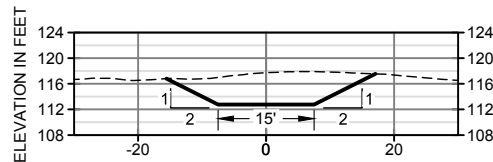
PLAN - SIDE CHANNEL - STA 10+00 - 15+00

SCALE: 1"=60'



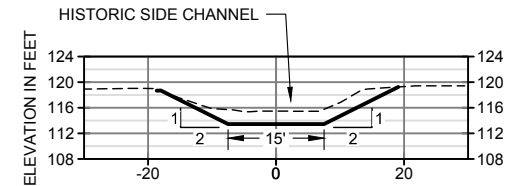
PROFILE - SIDE CHANNEL - STA 5+00 - 10+00

HORIZ. SCALE: 1"=60'
VERT. SCALE: 1"=60'



SECTION - STA 10+50

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



SECTION - STA 14+50

HORIZ. SCALE: 1"=30'
VERT. SCALE: 1"=30'



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SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 10+00 - 15+00

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1
EXTENSION

APPLICANT:



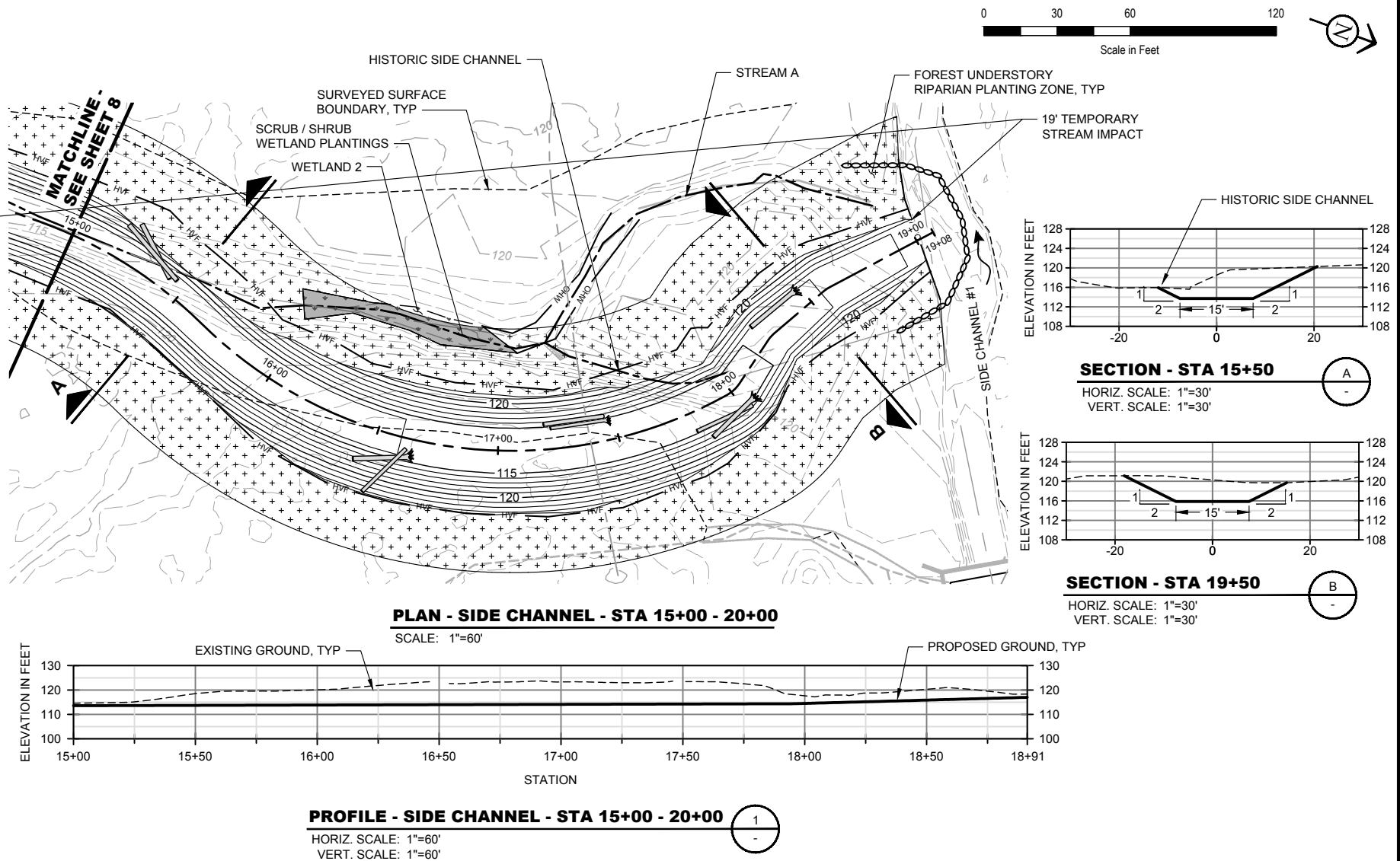
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FIGURE

8

STATE: WASHINGTON
COUNTY: SNOHOMISH
CITY: SULTAN
LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 8 OF: 12 DATE: JULY 2023



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SIDE CHANNEL PLAN, PROFILE AND SECTIONS - STA 15+00 - 18+91

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1
EXTENSION

APPLICANT:



SNOHOMISH PUBLIC UTILITIES DISTRICT 1
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FIGURE

9

STATE: WASHINGTON
COUNTY: SNOHOMISH
CITY: SULTAN
LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 9 OF: 12 DATE: JULY 2023

Forest Riparian Planting List (67,499 SF)

Common Name	Scientific Name	On-center Spacing (feet)
Trees		
Douglas fir	<i>Pseudotsuga menziesii</i>	12
Sitka spruce	<i>Picea sitchensis</i>	12
Big-leaf maple	<i>Acer macrophyllum</i>	12
Black cottonwood	<i>Populus balsamifera</i>	12
Paper birch	<i>Betula papyifera</i>	12
Red alder	<i>Alnus rubra</i>	12
Grand fir	<i>Abies grandis</i>	12
Total Trees = 469		
Shrubs		
Oceanspray	<i>Holodiscus discolor</i>	5
Snowberry	<i>Symphoricarpos albus</i>	5
Nootka rose	<i>Rosa nutkana</i>	5
Red elderberry	<i>Sambucus racemosa</i>	5
Indian plum	<i>Oemleria cerasiformis</i>	5
Black hawthorn	<i>Crataegus douglasii</i>	5
Thimbleberry	<i>Rubus parviflorus</i>	5
Salmonberry	<i>Rubus spectabilis</i>	5
Red flowering currant	<i>Ribes sanguineum</i>	5
Vine maple	<i>Acer circinatum</i>	5
Black raspberry	<i>Rubus leucodermis</i>	5
Total Shrubs = 2,231		

Forest Understory Riparian Planting List (53,428 SF)

Common Name	Scientific Name	On-center Spacing (feet)
Trees		
Douglas fir	<i>Pseudotsuga menziesii</i>	18
Sitka spruce	<i>Picea sitchensis</i>	18
Big-leaf maple	<i>Acer macrophyllum</i>	18
Western red-cedar	<i>Thuja plicata</i>	18
Western hemlock	<i>Tsuga heterophylla</i>	18
Grand fir	<i>Abies grandis</i>	18
Total Trees = 164		
Shrubs		
Oceanspray	<i>Holodiscus discolor</i>	10
Snowberry	<i>Symphoricarpos albus</i>	10
Nootka rose	<i>Rosa nutkana</i>	10
Red elderberry	<i>Sambucus racemosa</i>	10
Indian plum	<i>Oemleria cerasiformis</i>	10
Vine maple	<i>Acer circinatum</i>	10
Salal	<i>Gaultheria shallon</i>	10
Beaked hazelnut	<i>Corylus cornuta</i>	10
Total Shrubs = 369		

Scrub-Shrub Wetland Planting List (2,892 SF)

Common Name	Scientific Name	On-center Spacing (feet)
Pacific ninebark	<i>Physocarpus capitatus</i>	5
Pacific willow	<i>Salix lucida</i> spp. <i>lasianдра</i>	5
Sitka willow	<i>Salix sitchensis</i>	5
Red osier dogwood	<i>Cornus sericea</i>	5
Black twinberry	<i>Lonicera involucrata</i>	5
Western crabapple	<i>Malus fusca</i>	5
Total Shrubs = 116		

General Planting Notes:

1. Remove all non-native/invasive species within the planting areas. Remove blackberry rootballs. Dispose of offsite.
2. Mow pasture grasses to less than 3 inches tall in the southern portion of planting area, within areas designated as Forest Riparian Planting
3. Decompact the planting areas where heavy equipment was utilized.
4. Sheet mulch the entire pasture planting areas with at least 3 inches of arborist wood chip mulch within the southern portion of the planting area, within areas designated as Forest Riparian Planting. No mulch is necessary in Riparian Understory Forest Planting areas.
5. Install container plants between fall and early spring. Bareroot stock must be installed in the winter.
6. Keep bareroot plants shaded, cool and covered at all times prior to planting. Install live stakes during the winter dormant season).
7. Do not install plants below the ordinary high water mark.
8. Flag all installed plants with brightly-colored flagging.



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PLANTING SCHEDULE AND NOTES

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
 VERTICAL DATUM: NAVD 88
 PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1 EXTENSION

APPLICANT:



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FIGURE

10

STATE: WASHINGTON
 COUNTY: SNOHOMISH
 CITY: SULTAN
 LOCATION: S31 T28N R8E
 WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
 SHEET: 10 OF: 12 DATE: JULY 2023

EXCAVATE PLANTING HOLE 2x THE ROOT WIDTH AND 1.5x ROOT DEPTH WITH ENOUGH ROOM TO ALLOW ROOTS TO BE SPREAD DOWNWARDS AND Laterally THROUGHOUT THE SOIL PROFILE. EDGES OF THE PLANTING HOLE SHALL BE CUT PERPENDICULARLY TO THE SOIL SURFACE

REMOVE ROOTS, ROCKS, AND WOODY DEBRIS LARGER THAN 2 INCHES FROM PLANTING HOLE. REMOVE ALL WEEDS AND DEBRIS FROM PLANTING AREA

ROUGHEN SIDES OF PLANTING HOLE WITH SHOVEL OR SPADE

BUILD A SMALL SOIL MOUND IN CENTER OF PLANTING HOLE TO PROVIDE A STABLE BASE FOR PLANTING THE TREE OR SHRUB. COMPACT SOIL MOUND TO REDUCE SOIL SETTLING EFFECTS

FOLLOWING INSTALLATION OF PLANTS, PLACE MULCH LAYER AROUND BASE OF PLANT. MULCH SHALL BE 3" THICK. ENSURE MULCH IS KEPT AWAY FROM PLANT TRUNKS AND STEMS TO PREVENT ROTTING

BUILD A SMALL SOIL BERM RING AT PLANT DRIP LINE TO INCREASE WATER RETENTION

NATIVE SOIL

WHILE BACKFILLING, FIRM SOIL AROUND PLANT GENTLY WITH HANDS TO ELIMINATE AIR POCKETS. DO NOT INJURE ROOT SYSTEM WHILE BACKFILLING AND COMPACTING. ALL ROOTS SHALL BE BURIED BELOW THE SOIL SURFACE

ROOT-SHOOT INTERFACE SHALL BE AT SOIL SURFACE. DO NOT BURY TREE COLLAR WHERE TRUNK FLARE OCCURS IN ORDER TO AVOID ROTTING DUE TO BURIAL

PLACE PLANT ROOTS INTO PLANTING HOLE ON TOP OF SOIL MOUND AND GENTLY SPREAD ROOTS OUT EVENLY WITH FINGERS. CAREFUL NOT TO CAUSE HARM OR DAMAGE TO ROOTS. NO BUNCHING, J-ROOTING, OR TANGLING OF ROOTS SHALL OCCUR

DETAIL - BARE ROOT TREE OR SHRUB PLANTING

SCALE: NTS

1
-



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PLANTING DETAILS - 1 OF 2

APPLICANT:



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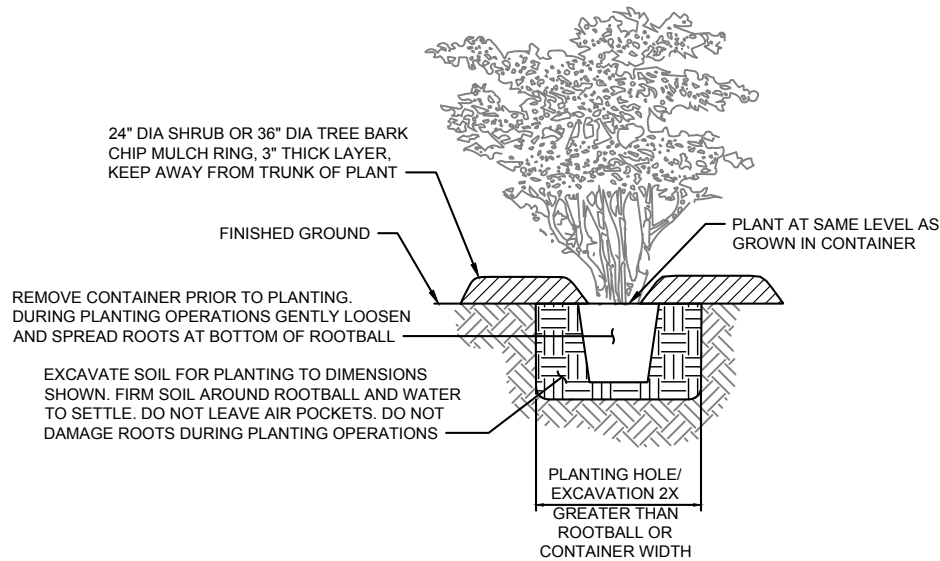
LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
VERTICAL DATUM: NAVD 88
PROPOSED PROJECT: SULTAN RIVER SIDE CHANNEL 1 EXTENSION

FIGURE

11

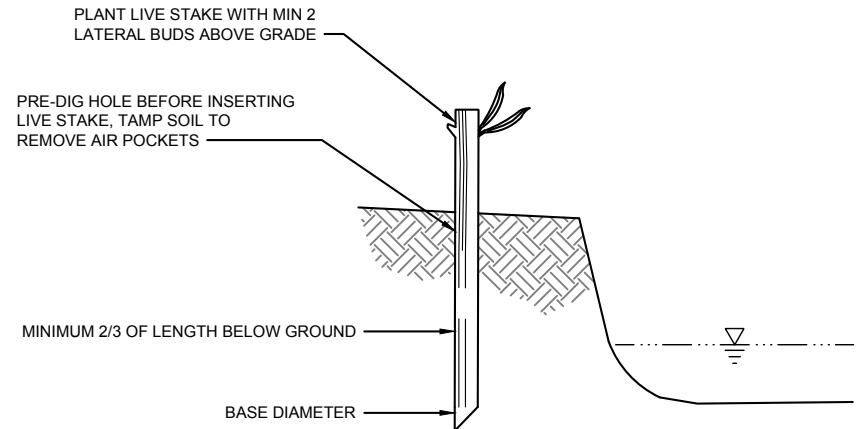
STATE: WASHINGTON
COUNTY: SNOHOMISH
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LOCATION: S31 T28N R8E
WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
SHEET: 11 OF: 12 DATE: JULY 2023



DETAIL - CONTAINER TREE AND SHRUB PLANTING

SCALE: NTS



LIVE STAKE PLANTING NOTES:

1. STAKES MUST BE 1/2" TO 1" DIAMETER AT BASE OF STAKE.
2. STAKES WILL HAVE MINIMAL WARPING OR BENDS, BEING MOSTLY STRAIGHT IN FORM, FOR EASE OF PLANTING.

DETAIL - LIVE STAKE PLANTING

SCALE: NTS



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PLANTING DETAILS - 2 OF 2

LAT/LONG: 47° 52' 19.50" N, 121° 49' 28.62" W
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APPLICANT:



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FIGURE

12

STATE: WASHINGTON
 COUNTY: SNOHOMISH
 CITY: SULTAN
 LOCATION: S31 T28N R8E
 WATERBODY: SIDE CHANNEL 1

REFERENCE NO: -
 SHEET: 12 OF: 12 DATE: JULY 2023