FINAL WETLAND AND STREAM ASSESSMENT REPORT

I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles

Thurston County, Washington

Work Order: XL6279
WIN: C00514S
I-5 McAllister PIN: 300514S
US 101 Mud Bay PIN: 310183S

Prepared By
WSDOT Headquarters
Environmental Services Office

August 11, 2021

WSDOT

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Executive Summary

The Washington State Department of Transportation (WSDOT) is proposing a bridge pile repair project at two different bridge locations, one at Interstate (I)-5 between milepost (MP) 114.09 and MP 114.14 crossing McAllister Creek and another at Unites States Route (US) 101 MP 362.83 to 362.89 across Mud Bay. The project occurs in two different locations in unincorporated Thurston County, Washington along the shores of south Puget Sound. The project will place column jackets on degraded bridge piers to prolong their service life, preserve the bridge structures, and maintain safety and operation. The column jackets will be applied to the western piers supporting the I-5 southbound and northbound McAllister Creek Bridges, the southbound on-ramp to I-5 at McAllister Creek, and both the US 101 north and southbound bridges on each side of Mud Bay.

This wetland, stream, and high tide line (HTL) assessment report informs the project on presence and location of wetlands and other waters and their buffers, and aids project designs on avoiding or minimizing potential impacts to these sensitive areas. These aquatic resources are regulated by the U.S. Army Corps of Engineers as waters of the United States, by the Washington State Department of Ecology (Ecology) as waters of the state, and by Thurston County through its municipal code.

Wetlands and other waters identified within the project study area include:

I-5 McAllister Creek Bridges

- One palustrine emergent (PEM) wetland and two estuarine emergent (EEM) wetlands.
- McAllister Creek, which is contained within and below the wetland boundaries of the two EEM wetlands.
- HTL of tidally influenced waters of McAllister Creek.

US 101 Mud Bay Bridges

- Two EEM wetlands.
- HTL of tidally influenced waters of Mud Bay.

The wetlands are Ecology and Thurston County Category II wetlands dominated by native, salt-tolerant vegetation in EEM wetlands and native and introduced herbaceous species in the PEM wetland. Each of the five wetlands have boundaries extending beyond the project limits.

Both the I-5 McAllister Creek Bridges and the US 101 Mud Bay Bridges location support federally listed species including evolutionarily significant unit Puget Sound chinook and distinct population segment Puget Sound steelhead, and both contain designated critical habitat for chinook. Sensitive plants or wetlands of high conservation value documented by Washington Department of Natural Resources are not previously identified within the project. Several Washington Department of Fish and Wildlife Priority Habitats and Species are identified within and adjacent to the study area. A separate Biological Assessment (BA) will be prepared to address federally listed endangered or threatened species and designated or proposed critical habitat.

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Acronyms and Abbreviations

BA	Biological Assessment
DNR	Washington Department of Natural Resources
DPS	distinct population segment
Ecology	Washington State Department of Ecology
EEM	estuarine emergent
ESA	endangered species act
ESU	evolutionarily significant unit
GIS	geographic information system
HGM	hydrogeomorphic wetland classification
HPT	highest predicted tide
HTL	high tide line
I	interstate
LRR	land resource area
MLLW	mean lower low water
MLRA	major land resource area
MP	milepost
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PEM	palustrine emergent
PEO	Project Engineer Office
PHS	priority habits and species
ROW	right of way
SB	southbound
SMP	Shoreline Master Program
US	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
W	wetland
WDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WRIA	water resource inventory area

1. Introduction

This report was prepared for Washington State Department of Transportation (WSDOT) Olympic Region in preparation of a bridge piling restoration project on Interstate (I)-5 McAllister Creek Bridges between Mile Post (MP) 114.09 and 114.14 and on United States (US) 101 Mud Bay Bridges between MP 362.83 and MP 362.89. Submerged portions of the bridge piles at both locations have large cracks and delamination. The project proposes maintenance of the bridge piles to prolong the service life of the bridges and maintain safety and operation.

The purpose of this report is to identify and describe wetlands, streams, and other jurisdictional waters occurring within the project. This report helps WSDOT:

- Avoid and minimize impacts to wetlands and other waters during the project design process and construction.
- Document wetland, stream, and high tide line boundary determinations for review by regulatory authorities.
- Provide background information for wetland and other waters mitigation plans should impacts be unavoidable.

This report provides supporting documentation for potential federal, state, and local permit applications. All waters identified in this report are assumed to be under US Army Corps of Engineers (USACE) and Washington State Department of Ecology (Ecology) jurisdiction.

2. Proposed Project

2.1. Project Location

The project is located at two different locations in unincorporated Thurston County, near Olympia, Washington, in south Puget Sound (Figure 1).

I-5 McAllister Creek Bridges occur just south of the Billy Frank Jr. Nisqually National Wildlife Refuge between Lacey and DuPont, Washington on I-5 between MP 114.09 and MP 114.14. The I-5 McAllister Creek Bridges project location is in Donation Land Claim 38, Township 18 north, Range 1 east, Willamette Meridian and in water resource inventory area (WRIA) 11-Nisquyally.

US 101 Mud Bay Bridges is just west of the Olympia city limits on US 101 between MP 362.83 and MP 362.89. The US 101 Mud Bay Bridges project location is in Section 18, Township 18 north, Range 2 west, Willamette Meridian and in WRIA 13-Deschutes.

Both project locations occur within the WSDOT right of way (ROW). Both bridge locations are in land resource region (LRR) A and major land resource area (MLRA) 2.

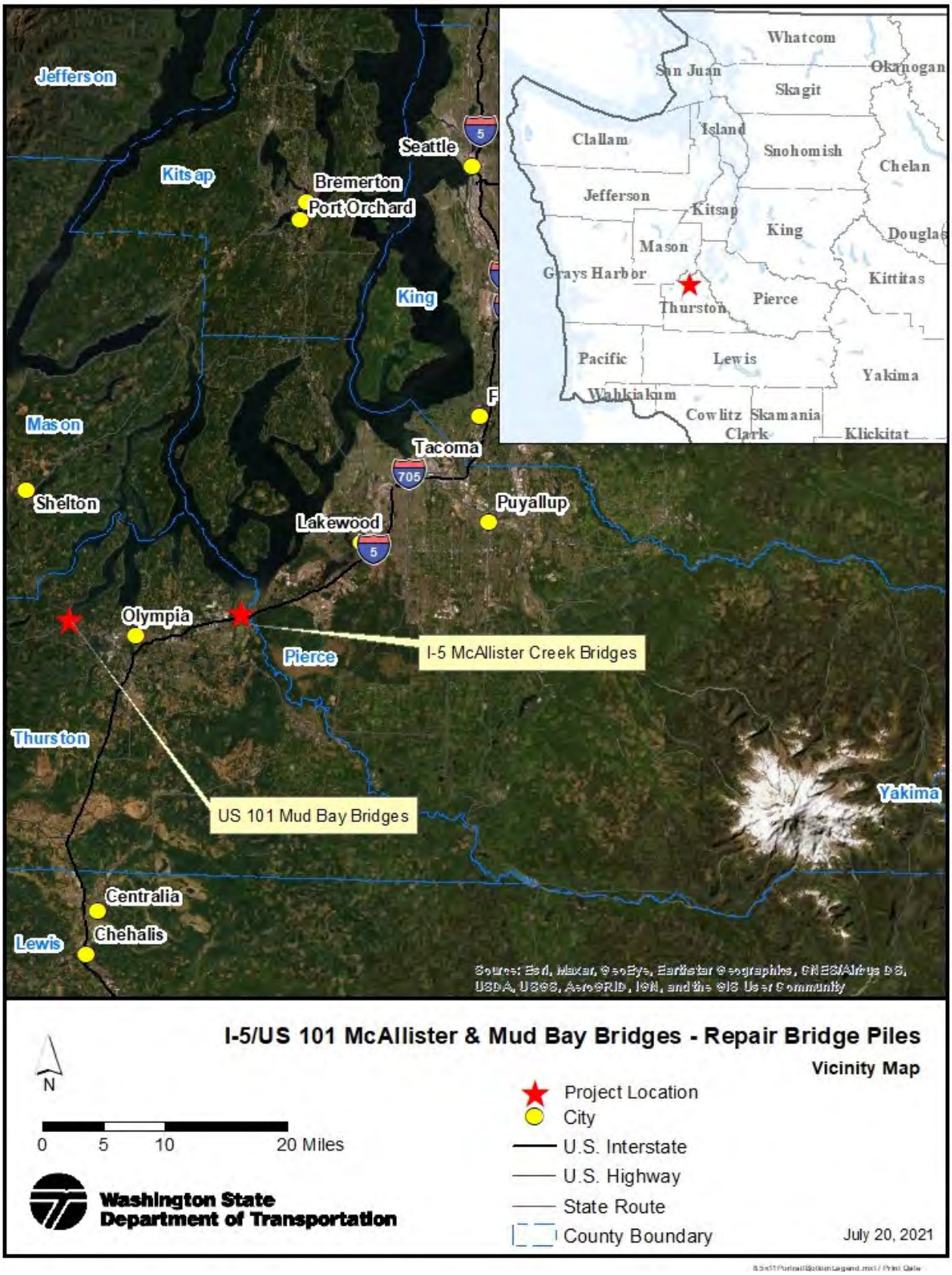

Figure 1. Vicinity Map.

2.2. Project Purpose and Description

The purpose of the project is to maintain and preserve degraded bridge piles to prolong the service life, integrity, and safe operation of several bridges at I-5 McAllister Creek and at US 101 Mud Bay. Many of the submerged concrete piles at both I-5 McAllister Creek Bridges and US 101 Mud Bay Bridges have large cracks and delamination due to corrosion of the reinforcing steel. To extend the service life of the structures at both bridge sites, the piles will be cleaned prior to installation of fiber reinforced polymer column jackets. The column jackets will be placed on the piles to an elevation of two feet above mean higher high water.

2.3. Study Area

The study area includes the ROW on I-5 between MP 114.09 and MP 114.14, and US 101 between MP 362.83 and MP 362.89 (Figure 3; Figure 4; Appendix F). This report documents wetlands, one stream, and the high tide line (HTL) of tidally influenced waters within the study area at these two locations. Should proposed project impact areas change and extend beyond the study area, wetland and other water assessment will need to occur in those additional areas.

3. Methods

The following data sources were reviewed for information on precipitation, topography, drainage patterns, soils, vegetation, and potential or known wetlands and streams in the project vicinity:

- Natural Resources Conservation Service (NRCS) Climate Data for Thurston County, Station Olympia, Washington (NRCS 2021a) (Appendix A-1 and A-2).
- U.S. Geological Survey (USGS) Digital Raster Graphics topographic maps (USGS 2021a.) (Appendix A-3).
- National Wetlands Inventory (NWI) maps (USFWS 2021b; FGDC 2013) (Appendix A-4).
- NRCS, Soil Survey of Thurston County Washington (NRCS 2021d) and Washington State Hydric Soils (NRCS 2021b) (Appendix A-5).
- Aerial photograph, Washington 1ft 2019, 4 band, Statewide Imagery (Appendix A-6).

Scientific plant names in this report are from the USACE National Wetland Plant List, version 3.4 (USACE 2018).

Wetlands, stream, and aquatic resources assessment fieldwork was completed:

- On April 6, 2021 at US 101 Mud Bay Bridges and April 19, 2021 at I-5 McAllister Creek.
- By WSDOT wetland biologists Tatiana Dreisbach and Tom Mohagen.
- While walking the extent of the study area.

Wetland, stream, and HTL assessment and report preparation follows policy and guidance on the WSDOT Wetlands webpage (WSDOT 2021).

3.1. Wetland Delineation, Classification, Functions, and Buffers

Wetlands were delineated using routine methods described in:

- Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987).
- Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010).

Wetland boundaries were delineated based on on-site observations of vegetation, soils, and hydrology in conjunction with background information listed above. Wetland boundaries were flagged by WSDOT biologists and subsequently surveyed by a WSDOT survey crew (Appendix F). Each of the five wetlands in the project have boundaries extending beyond the study area.

Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) classification system (Cowardin) (USFWS 2021b; FGDC 2013) and the hydrogeomorphic wetland classification system (HGM) (Brinson 1993). Wetlands were rated using the Washington State Wetland Rating System for Western Washington: 2014 Update (Hruby 2014). The Thurston County Municipal Code (Thurston County 2021b) references the 2014 Rating System.

Thurston County wetland buffers (Thurston County 2021b) were applied to the wetlands in the project and consider Wetland Rating habitat scores for the palustrine Wetland 3 at I-5 McAllister Creek Bridges site. Buffer widths range from 50 to 250 feet depending on wetland rating, rating habitat scores, and other special characteristics as defined by the Wetland Rating System.

Wetland functions were assessed using the Wetland Functions Characterization Tool for Linear Projects (BPJ tool) (Null et al. 2000).

Buffers were applied based on high intensity land use. Wetland buffer condition within the study area was assessed using the following criteria:

- Land use (e.g. agriculture, residential, commercial, industrial).
- Buffer vegetation structure (tree, shrub, herb, vine, un-vegetated).
- Buffer vegetation community (dominant plant species per strata, native vs. non-native dominants, and description of invasive species or noxious weeds).

3.2. Stream Delineation, Classification, and Buffers

The ordinary high water mark (OHWM) of McAllister creek was not delineated. The OHWM occurs within and below the Wetland 1 and Wetland 2 boundaries at the I-5 McAllister Creek Bridges site.

Fish presence was determined based on available Washington State Department of Fish and Wildlife (WDFW) data (WDFW 2021b).

Thurston County stream buffers (Thurston County 2021b) were applied to streams in the project, in conjunction with Washington State Department of Natural Resources (DNR) Forest Practices Rules, water type classifications (DNR 2021a). Buffer widths range from 100 to 250 feet depending on water type. When wetland and stream buffers overlap, they are treated only as wetland buffer (Appendix F).

3.3. High Tide Line Delineation and Buffers

The HTL was used to delineate tidally influenced waters in the study area (USACE 2020). The mean elevation of the highest predicted tide (HPT) over the 10-year period was applied to each of the two bridge locations to establish HTL.

To establish HTL biologists reviewed:

- Mean elevation of HPT data for the Budd Inlet, South of Gull Harbor, Washington Station number 9446807 for the 10-year period between January 1, 2021 and December 31, 2030 (NOAA 2021b) which applies to both the I-5 McAllister Creek Bridges and the US 101 Mud Bay Bridges sites.
- Predicted higher high water tidal elevation and time for the days of field work on April 6 and April 19, 2021.
- Field indicators.

Biologists compared HPT elevation to field indicators by first locating higher high water field indicators for the dates of field work on April 6 and 19, 2021, then assuming the predicted higher high water tidal elevation and time for the days of field work aligned with and matched the field indicators of the higher high water tide, then estimating the difference in elevation from the field indicators of the higher high water tide up to the HPT elevation, and finally looking for field indicators of HTL at the HPT.

WSDOT biologist, Tatiana Dreisbach coordinated with USACE liaisons, Susan Buis and Jennifer Lang on July 8, 2021 to discuss WSDOT's HTL recommendation.

Thurston County buffers were applied to the HTL using the standard marine riparian habitat area width of 250 feet (Thurston County 2021b). The Thurston County 1990 Shoreline Master Program (SMP) Map was used to note the shoreline environment designations (Thurston County 2021a).

3.4. Wetland, Stream, and HTL Boundary Documentation

Boundaries of wetlands were documented using WSDOT Sensitive Areas Naming & Flagging Conventions (WSDOT 2021). Wetland sample point locations and boundaries of wetlands were marked with alphanumeric characters on pink flags. The portions of boundaries occurring within the study area were subsequently surveyed.

The project engineer office (PEO) applied the HPT elevation across both sites to establish the HTL boundary.

3.5. Species and Habitats of Interest

A separate Biological Assessment (BA) will address impacts to Endangered Species Act (ESA) federally listed threatened or endangered wildlife species and proposed and designated critical habitat. This report includes preliminary information regarding potential ESA species and habitat, Washington State threatened, endangered, or sensitive species, and habitats of interest that may occur in the project. The following data sources were reviewed for information on federally and state listed threatened, endangered, candidate, sensitive species, and species of concern, as well as habitats of interest:

- Federally listed threatened, endangered, or candidate wildlife species (WDFW 2021c) and proposed and designated critical habitat (NOAA 2021c).
- Washington State threatened, endangered, and sensitive plants (DNR 2021b).
- Wetlands of High Conservation Value (DNR 2021c).
- WDFW Priority Habitats and Species (PHS) (WDFW 2021a).

4. Existing Conditions

4.1. Landscape Setting

The I-5 McAllister Creek portion of the project is in the historic floodplain of the Nisqually River near the river delta, where McAllister Creek flows along the west edge of the valley and the Nisqually River towards the east/central valley floor. The project occurs in the lowest part of the watershed as McAllister Creek meets the tidally influenced waters of Nisqually Reach and the Nisqually Estuary in south Puget Sound. McAllister Creek headwaters are directly south at McAllister Springs. McAllister Spring and McAllister Creek is known by native communities as Medicine Creek and Medicine Springs. The McAllister Creek drainage basin is in WRIA 11-Nisqually in the Lower Nisqually River – Frontal Puget Sound Watershed (5th HUC watershed 1711001503). The project is just south of the Billy Frank Jr. Nisqually National Wildlife Refuge. The area has a long and rich geologic and cultural history, with both natural and anthropogenic land use changing over time. Current land use in the watershed includes primarily agriculture with some residential and public and private forest lands. The northwestern portion of the Nisqually Indian Tribe Reservation and Holroyd Nisqually Plant gravel pit are located on the eastern edge of the watershed.

The US 101 Mud Bay portion of the project occurs at the southern extent of Eld Inlet in south Puget Sound, just north of where McLane Creek meets the tidally influenced waters of Mud Bay. The headwaters of McLane Creek originate south of Mud Bay in the Black Hills in Capitol State Forest, where land use is a mix of DNR managed forest and recreation. The Mud Bay drainage basin is in WRIA 13-Deschhutes in the McLane Creek – Frontal Puget Sound Watershed (5th HUC watershed 1711001905).

The landscape in and around the project area is typical of south Puget Sound estuaries. Typical estuarine soils of fine texture overlaying parent material or fill for infrastructure support predominantly native, salt tolerant vegetation, tolerant of regular and occasional tidal inundation. Surrounding upland areas are mixed coniferous and deciduous forests dominated by native trees and shrubs. The banks of McAllister Creek, for the reach within the project limits, are armored with a sackcrete retaining wall, functioning as a dike. Some sections of bank armoring also include rip rap. The shoreline at Mud Bay in the study area is free from armoring, however, fill material was presumably paced to form the US 101 Bridge approaches. Tidal waters are free in this location to influence estuarine and beach formation processes (Figure 2).

Figure 2. Landscape setting photos taken on April 19, 2021 at McAllister and April 6, 2021 at Mud Bay

4.2. Climate, Precipitation, and Growing Season

4.2.1. Climate

The climate is wet and mild, with ocean moderated temperatures meeting the vegetated west coast and regularly releasing significant precipitation. As the weather collides with the Olympic Peninsula after coming off the Pacific Ocean, extreme precipitation is released as weather continues west across the Olympic Peninsula. Relatively less rain hits the Puget Lowlands where the project occurs. The area averages 50.79 inches of rain per year (NRCS 2021a).

4.2.2. Precipitation

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in Engineering Field Handbook (NRCS 2015) to determine if precipitation occurring in the three full months prior to the site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. When considering the three prior months as a whole, normal precipitation conditions were present prior to the two April 2021 field visits. The first prior month was drier than normal and the second and third months prior to field work were wetter than normal (Appendix A-1).

Light precipitation was recorded in the ten days preceding field work for both field visits (Appendix A-2).

4.2.3. Growing Season

Field work was conducted during the growing season in April 2021 (NRCS 2021a). Many plants were identifiable to species and temperatures were typical of growing season conditions. The leaves on observed woody species were fully emerged and many herbaceous plants had new vegetative growth such as yellow Lyngbye's sedge (*Carex lyngbyei*) and common velvetgrass (*Holcus lanatus*). Some herbaceous species were not yet identifiable, as flowers had not yet emerged.

4.3. Wetlands

4.3.1. Overview

Three wetlands were identified in the study area at I-5 McAllister Creek Bridges and two wetlands were identified at US 10 Mud Bay Bridges (Table 1). Of the five total wetlands identified, four are estuarine emergent wetlands (EEM) and one is depressional palustrine emergent (PEM). The two EEM wetlands at I-5 McAllister Creek Bridges occur near the mouth of the creek and experience tidal intrusion during regular daily high tide cycles, and freshwater inputs at lower elevations as tidal waters ebb to low tide. The four EEM wetlands and one PEM wetland are Ecology and Thurston County Category II wetlands. The EEM wetlands are dominated by native, salt tolerant vegetation. The PEM wetland at I-5 McAllister Creek occurs in a channel lined with dike walls, with an apparent non-functioning tide gate, and is dominated by native and introduced PEM wetland species.

Summaries of each wetland (Tables 3 through 7), delineation data sheets (Appendix B), wetland rating forms (Appendix C), wetland functional assessment summaries (Table 2; Appendix D), and plan sheets showing wetland locations (Appendix F) are provided.

Table 1. Wetlands within the project corridor.

Wetland[a]	Wetland Classification				Wetland Size (acre)[e]	Buffer Width (feet)[f]
	Cowardin[b]	HGM	Ecology[c]	Local Jurisdiction[d]		
I-5 McAllister Creek Bridges						
1	EEM	estuarine	II	II	~4.14	220
2	EEM	estuarine	II	II	~4.14	220
3	PEM	depressional	II	II	~1.23	160
Total					~9.51	
US 101 Mud Bay Bridges						
1	EEM	estuarine	II	II	~1.92	220
2	EEM	estuarine	II	II	~2.49	220
Total					~4.41	

[a] Wetland identifier.
[b] NWI Class based on vegetation: PEM = palustrine emergent, EEM = estuarine emergent (Cowardin et al. 1979).
[c] Ecology rating (Hruby 2014).
[d] Thurston County wetland rating (Thurston County 2021b).
[e] Wetland area is grossly estimated based on estimated wetland boundaries established in wetland rating figure and includes area extending beyond the study area.
[f] Thurston County wetland buffer width based on overall wetland rating and rating habitat scores for the PEM Wetland 3 at the I-5 McAllister Creek site (Thurston County 2021b).

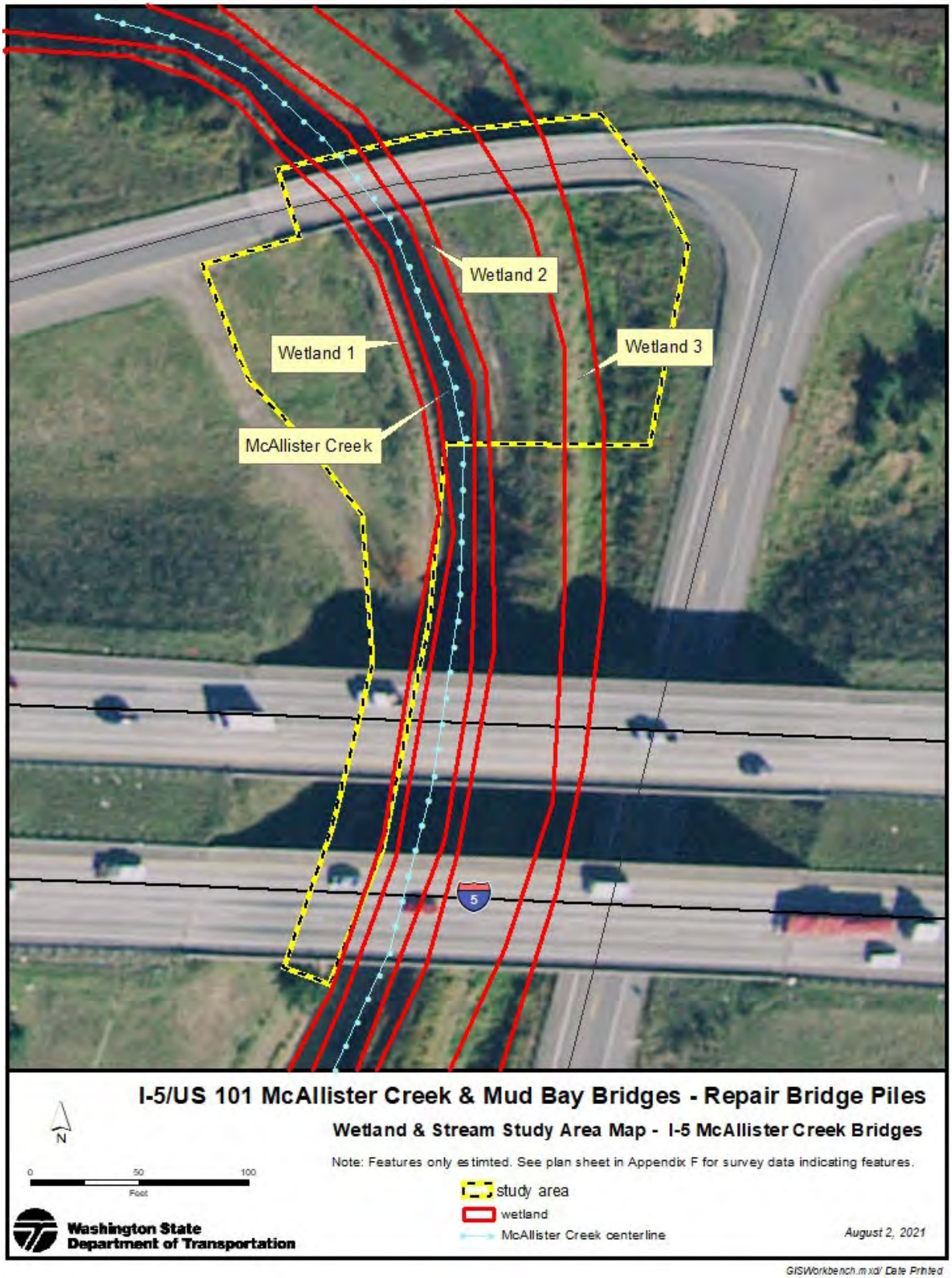

Figure 3. I-5 McAllister Creek Bridges wetland boundaries, stream location, and study area map.

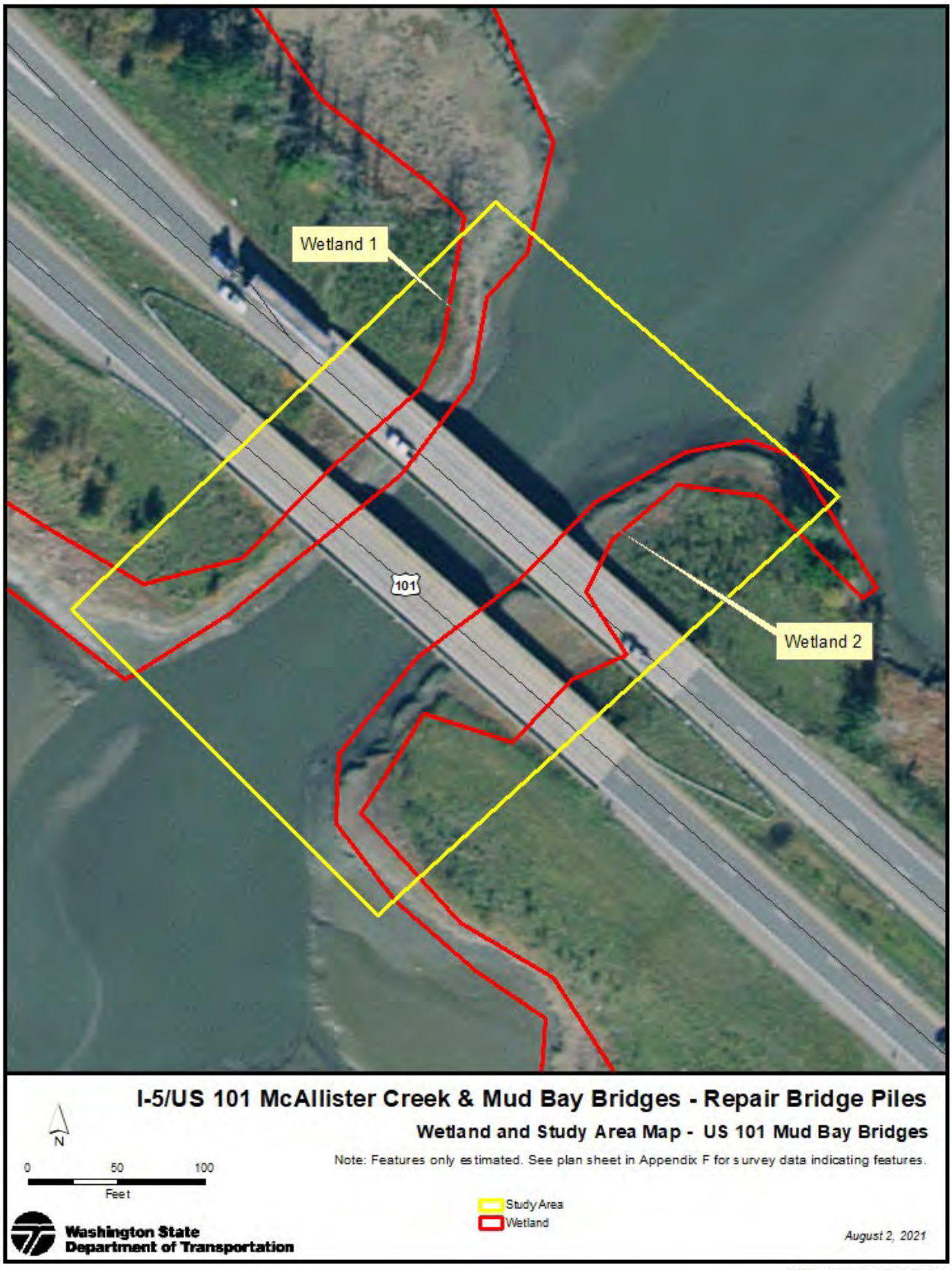

Figure 4. US 101 Mud Bay Bridges wetland boundaries and study area map.

4.3.2. Vegetation

Vegetation in the study area is typical of Puget Sound lowlands and estuaries (Figures 5 and 6). The estuarine community is dominated by salt tolerant, native emergent species including inland saltgrass (*Distichlis spicata*), Lyngbye's sedge, and pickleweed (*Salicornia pacifica*), with scattered individuals of Puget Sound gumweed (*Grindelia integrifolia*), tufted hairgrass (*Deschampsia caespitosa*), silverweed cinquefoil (*Potentilla anserina*), and spear saltbush (*Atriplex patula*). In addition, a rush that was not yet flowering, which may be black rush (*Juncus gerardi*), was a community dominant at US 101 Mud Bay Bridges. The PEM wetland at I-5 McAllister Creek Bridges has reed canarygrass (*Phalaris arundinacea*) and broadleaf cattail (*Typha latifolia*) comprising the majority of the vegetation community in the study area and several patches of bird's-foot trefoil (*Lotus corniculatus*).

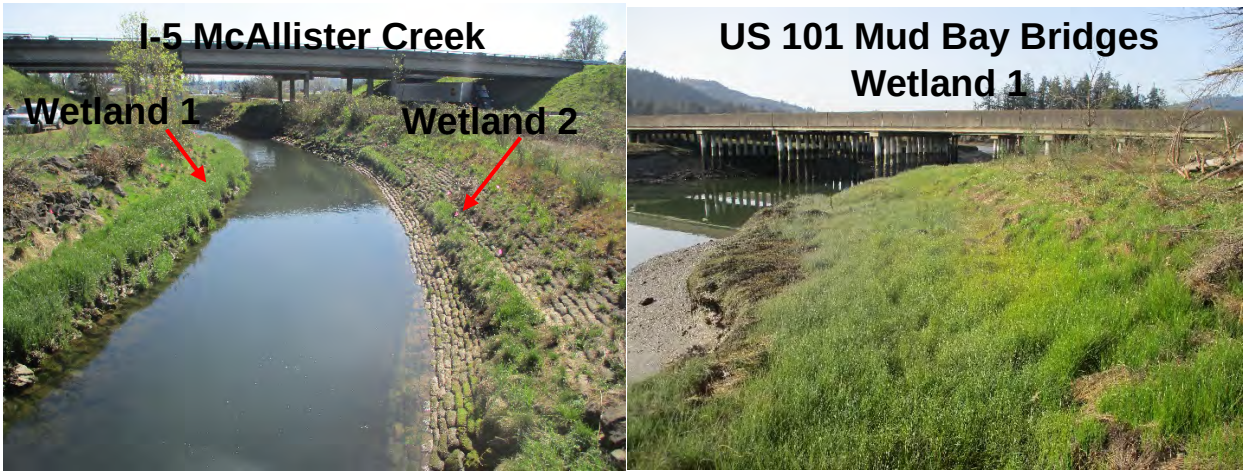

Figure 5. Photo of typical wetlands in the study area.

4.3.3. Soils

Soils in the I-5 McAllister Creek study area are mapped as Dystric Xerochrepts and Puget silt loam, a hydric soil in Washington State (NRCS 2021b; NRCS 2021d) (Appendix A-5). Puget soils are poorly drained soils formed in recent alluvium on floodplains and low river terraces (NRCS 2021c).

Soils in the US 101 Mud Bay study area are either unmapped in tidally influenced areas or are mapped as Xerothents (NRCS 2021d) (Appendix A-5).

4.3.4. Hydrology

Hydrology in the estuarine emergent wetlands comes from two primary sources in the I-5 McAllister Creek study area. McAllister Creek provides perennial flows, and water levels fluctuate with seasonal inputs. Water levels rise and fall across the riverbank daily with the tidal action. The creek provides constant base flows of fresh water. Daily tidal inundation pushes a salt wedge up McAllister Creek for a significant reach of the creek, as indicated by the presence of salt tolerant vegetation well south of the study area. The banks of the creek in the study area are diked and lined with a sackcrete armoring wall and rip rap. Just downstream of the study area is the Nisqually Estuary where the McAllister Creek channel carves its way through the mudflats of the estuary towards Nisqually Reach.

The PEM wetland in the I-5 McAllister Creek study area has a high water table, shallow inundation, and soil saturation sustained by groundwater. The northern extent of the wetland, north of the study area has and inlet/outlet structure that appeared to be a non-functioning tide gate, though its intent and current function is not confirmed. The wetland is assumed to currently function as a close depression between dike walls extending into the Nisqually Estuary and separating the wetland from the adjacent McAlister Creek and surrounding transportation infrastructure. The tide gate does not appear to allow saltwater intrusion based on the palustrine vegetation community. The historic function of this altered wetland is not apparent based on field observations.

At the US 101 Mud Bay study area hydrology is driven by the daily tide cycles of Mud Bay at the southern extent of Eld Inlet. Daily high tides provide inundation and subsurface hydrology to the wetlands. Spring tides provide extreme high tide events, where surface water occasionally extends to the upper edges of the estuarine emergent wetlands.

4.3.5. Wetland Functions

The EEM wetlands at I-5 McAllister Creek Bridges provide limited hydrologic and water quality functions, and moderate to high habitat functions including proving habitat for ESA-listed salmonids. The PEM wetland at I-5 McAllister Creek Bridges provides nutrient and toxicant removal and flood flow alteration in addition to low habitat functions. The EEM wetlands at US 101 Mud Bay Bridges provide moderate water quality fictions, high shoreline stabilization, and high habitat functions (Table 2; Appendix E).

Table 2. Functions and values of wetlands in the study area.

Function/Value[a]	McAllister Wetland		Mud Bay Wetland
	1 & 2	3	1 & 2
Water Quality Functions			
Sediment Removal	X	-	X
Nutrient and Toxicant Removal	X	X*	X
Hydrologic Functions			
Flood Flow Alteration	n/a	X*	n/a
Erosion Control & Shoreline Stabilization	X*	n/a	X*
Habitat Functions			
Production & Export of Organic Matter	X*	X	X*
General Habitat Suitability	-	-	X
Habitat for Aquatic Invertebrates	-	X*	X*
Habitat for Amphibians	-	X	-
Habitat for Wetland-Associated Mammals	X*	-	X*
Habitat for Wetland-Associated Birds	X	-	X*
General Fish Habitat	X*	-	X*
Native Plant Richness	-	-	-
Special Characteristics			
Educational or Scientific Value	-	-	-
Uniqueness and Heritage	X*	-	X*

[a] "-" indicates that the function is not present
"X" indicates the function is present
"X*" indicates a principal function of the wetland
"n/a" indicates the function does not apply to that type of HGM or necessary habitat elements are lacking to provide the function.

4.3.6. Wetland Buffers

Functional wetland buffers surrounding each of the five wetlands at both bridge sites are limited to non-existent. The transportation infrastructure is close to each of the wetlands and only a narrow, herbaceous dominated buffer is present. Where present the low functioning buffers are a mix of native and introduced grassed and other herbs, providing very limited buffering functions. Himalayan blackberry (*Rubus armeniacus*) and Scotch broom (*Cytisus scoparius*) are present in some buffer areas. US 10 Mud Bay Bridges has some clumped woody vegetation dominated my native species and includes a small patch of Douglas-fir (*Pseudotsuga menziesii*), east of Wetland 2.

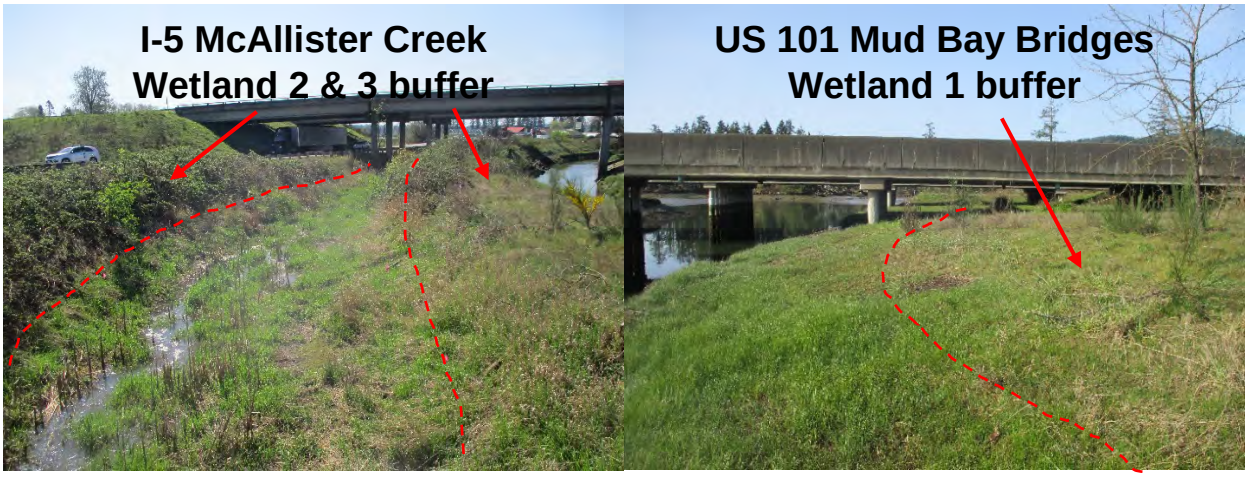

Figure 6. Buffers shown upgradient of red lines.

Table 3. I-5 McAllister Creek - Wetland 1 summary

I-5 MCALLISTER CREEK WETLAND 1 – INFORMATION SUMMARY		
Location:	West bank of McAllister Creek, between I-5 southbound (SB) lanes and SB on ramp.	
	**Local Jurisdiction**	Thurston County
	Ecology Rating (2014)	II
	Local Rating	II
	Thurston County Buffer Width	220 feet
	Wetland Size	~4.14 acres
	Cowardin Class	EEM
	HGM Class	estuarine
	Wetland Data Sheet(s)	Appendix B; Sampling Point W1-SP1
	Upland Data Sheet(s)	Appendix B; Sampling Point W1-SP2
Wetland Delineation		
Dominant Vegetation	Trees – none Shrubs – none Herbaceous – Lyngbye's sedge, inland saltgrass, pickleweed	
Soils	Soils are significantly disturbed due to establishment on a dike retaining wall made of a sackcrete and rip rap. Although hydric soils were not observed, hydric conditions are present. The area has hydrophytic vegetation present and receives daily tidal water inputs, as well as seasonal and occasional riverine hydrologic inputs. Problematic hydric soils are present.	
Hydrology	Daily tidal inundation and riverine inputs form McAllister Creek are the primary hydrology source for this wetland. Indicators Saturation (A3), Water Marks (B1), Sediment Deposits (B2), Aquatic Invertebrates (barnacles) (B13), Geomorphic Position (D2), and FAC-Neutral Test (D5) met.	
Rationale for Delineation	Tidally influenced EEM wetland that has strong salt tolerant hydrophytic vegetation community typical of Puget Sound estuaries and tidally influenced areas.	
Wetland Rating		
Rationale for Local Rating	The Thurston County Municipal Code classifies wetlands based on the Washington State Wetland Rating System (Thurston County 2021b). Wetland 1 rates as a Category II.	
Wetland Buffers		
Buffer Condition	Buffers are present west of the wetland but are primarily disturbed herbaceous grass and forb communities formed on fill between the I-5 main line and SB on ramp and provide little buffer function. The buffer also includes a maintenance access road and parking turn around further limiting buffer functions.	

Table 4. I-5 McAllister Creek - Wetland 2 summary

I-5 MCALLISTER CREEK WETLAND 2 – INFORMATION SUMMARY	
Location:	East bank of McAllister Creek, between I-5 SB lanes and SB on ramp.

Local Jurisdiction	Thurston County
Ecology Rating (2014)	II
Local Rating	II
Thurston County Buffer Width	220 feet
Wetland Size	~4.14 acres
Cowardin Class	EEM
HGM Class	estuarine
Wetland Data Sheet(s)	Appendix B; Sampling Point W2-SP1
Upland Data Sheet(s)	Appendix B; Sampling Point W2-SP2

Wetland Delineation	
Dominant Vegetation	Trees – none Shrubs – none Herbaceous – Lyngbye's sedge, pickleweed
Soils	Soils are significantly disturbed due to establishment on a dike retaining wall made of a sackcrete. Although hydric soils were not observed, hydric conditions are present. The area has hydrophytic vegetation present and receives daily tidal water, as well as seasonal and occasional riverine hydrologic inputs. Problematic hydric soils are present.
Hydrology	Daily tidal inundation and riverine inputs form McAllister Creek are the primary hydrology source for this wetland. Indicators Water Marks (B1), Sediment Deposits (B2), Geomorphic Position (D2), and FAC-Neutral Test (D5) met. Sample point location occurs in tidally influenced areas with a salt tolerant, hydrophytic vegetation community. The bank was glistening about 12 inches below the Lyngbye's sedge bench during the sit visit and seaweed - Rockweed (*Fucus* sp.) was observed just below the sample point location.
Rationale for Delineation	Tidally influenced EEM wetland that has strong salt tolerant, hydrophytic vegetation community typical of Puget Sound estuaries and tidally influenced areas.
Wetland Rating	
Rationale for Local Rating	The Thurston County Municipal Code classifies wetlands based on the Washington State Wetland Rating System (Thurston County 2021b). Wetland 2 rates as a Category II.
Wetland Buffers	
Buffer Condition	Buffers are present east of the wetland on the dike. Buffers are disturbed and provide little buffering function. Vegetation is a mix of native and introduced herbaceous species with some scattered Scotch broom individuals.

Table 5. I-5 McAllister Creek - Wetland 3 summary

I-5 MCALLISTER CREEK WETLAND 3 – INFORMATION SUMMARY	
Location:	Slough channel west of Brown Farm Rd., east of McAllister Creek, between I-5 SB lanes and SB on ramp.

Local Jurisdiction	Thurston County
Ecology Rating (2014)	II
Local Rating	II
Thurston County Buffer Width	160 feet
Wetland Size	~1.23 acres
Cowardin Class	PEM
HGM Class	depressional
Wetland Data Sheet(s)	Appendix B; Sampling Point W3-SP1
Upland Data Sheet(s)	Appendix B; Sampling Point W3-SP2

Wetland Delineation	
Dominant Vegetation	Trees – none Shrubs – Sitka willow (*Salix sitchensis*) Herbaceous – reed canarygrass, broadleaf cattail, bird's-foot trefoil
Soils	Soil was inundated and soil pit was not excavated. The soil meets the definition of a hydric soil due to prolonged presence of inundation, soil saturation, and high water table during the growing season, along with presence of a hydrophytic vegetation community.
Hydrology	This wetland is a channel that appears to currently be functioning as s closed depression. The wetland is surrounded by Brown Farm Rd. to the east and the east bank of the McAllister Creek dike to the west. The northern, down gradient portion has an apparently non-function tide gate, acting as a closed depression. It appears a high groundwater table is the primary source of hydrology for this wetland and provides a long duration of wetland hydrology thought the growing season. Indicators Surface Water (A1), High Water Table (A2), Saturation (A3), Geomorphic Position (D2), and FAC-Neutral Test (D5) met.
Rationale for Delineation	Depressional wetland which supports hydrophytic vegetation, has hydric soils, and shallow inundation, high water table, and soil saturation in April. Hydrophytic vegetation and wetland hydrology indicators were helpful in determining the wetland boundary.
Wetland Rating	
Rationale for Local Rating	The Thurston County Municipal Code classifies wetlands based on the Washington State Wetland Rating System (Thurston County 2021b). Wetland 3 rates as a Category II.
Wetland Buffers	
Buffer Condition	The wetland is surrounded by Brown Farm Rd. to the east and the east bank of the McAllister Creek dike to the west. Himalayan blackberry lines the road prism up to Brown Farm Rd. and the McAllister Creek dike wall has reed canarygrass and other herbaceous vegetation established. A functional buffer is lacking.

Table 6. US 101 Mud Bay - Wetland 1 summary

US 101 MUD BAY WETLAND 1 – INFORMATION SUMMARY		
Location:	Northwest side of Mud Bay, below US 101 Mud Bay Bridges.	
	**Local Jurisdiction**	Thurston County
	Ecology Rating (2014)	II
	Local Rating	II
	Thurston County Buffer Width	220 feet
	Wetland Size	~1.92 acres
	Cowardin Class	EEM
	HGM Class	estuarine
	Wetland Data Sheet(s)	Appendix B; Sampling Point W1-SP1
	Upland Data Sheet(s)	Appendix B; Sampling Point W1-SP2
Wetland Delineation		
Dominant Vegetation	Trees – none Shrubs – none Herbaceous – black rush, pickleweed, inland saltgrass	
Soils	Soil matrices of 10YR 4/2 and 2.5Y 6/3 were observed throughout the upper 16 inches of the soil surface. Redoximorphic concentrations or depletions were not observed. This wetland occurs in a tidally influenced area where tidal inundation and tidally driven high groundwater regularly provide hydrologic inputs. Despite the soil not meeting an indicator it is a hydric soil due to regular wetland hydrology inputs during the growing season, the hydrophytic, salt-tolerant vegetation community, and the landscape setting and geomorphology.	
Hydrology	Daily tidal inundation and associated groundwater from Mud Bay are the primary hydrology source for this wetland. Indicators Saturation (A3), Geomorphic Position (D2), and FAC-Neutral Test (D5) met.	
Rationale for Delineation	Estuarine wetland with a salt tolerant, hydrophytic vegetation community. Wetland occurs in the intertidal zone of Puget Sound and regularly has surface and subsurface tidal water inputs.	
Wetland Rating		
Rationale for Local Rating	The Thurston County Municipal Code classifies wetlands based on the Washington State Wetland Rating System (Thurston County 2021b). Wetland 1 rates as a Category II.	
Wetland Buffers		
Buffer Condition	Buffers west of the wetland are dominated by an herbaceous community of primarily introduced grasses and other forb species. Some trees and shrubs are present. Scotch broom and Himalayan blackberry are also scattered. The buffer provides limited buffering functions for habitat, water quality, and screening. The wetland is bordered by the tidal water of Mud Bay to the east.	

Table 7. US 101 Mud Bay - Wetland 2 summary

US 101 MUD BAY WETLAND 2 – INFORMATION SUMMARY		
Location:	Southeast side of Mud Bay, below US 101 Mud Bay Bridges.	
	**Local Jurisdiction**	Thurston County
	Ecology Rating (2014)	II
	Local Rating	II
	Thurston County Buffer Width	220 feet
	Wetland Size	~2.49 acres
	Cowardin Class	EEM
	HGM Class	estuarine
	Wetland Data Sheet(s)	Appendix B; Sampling Point W2-SP1
	Upland Data Sheet(s)	Appendix B; Sampling Point W2-SP2
Wetland Delineation		
Dominant Vegetation	Trees – none Shrubs – none Herbaceous – pickleweed, black rush, Puget Sound gumweed	
Soils	Soil matrices of 2.5Y 4/3 were observed throughout the upper 16 inches of the soil surface. Redoximorphic concentrations or depletions were not observed. This wetland occurs in a tidally influenced area where tidal inundation and tidally driven high groundwater regularly provide hydrologic inputs. Despite the soil not meeting an indicator it is a hydric soil due to regular wetland hydrology inputs during the growing season. The hydrophytic, salt-tolerant vegetation community, and the landscape setting and geomorphology further support this assertion.	
Hydrology	Daily tidal inundation and associated groundwater from Mud Bay are the primary hydrology source for this wetland. Indicators Drift Deposits (B3), Geomorphic Position (D2), and FAC-Neutral Test (D5) met.	
Rationale for Delineation	Estuarine wetland with a salt tolerant, hydrophytic vegetation community. Wetland occurs in the intertidal zone of Puget Sound and regularly has surface and subsurface tidal water inputs.	
Wetland Rating		
Rationale for Local Rating	The Thurston County Municipal Code classifies wetlands based on the Washington State Wetland Rating System (Thurston County 2021b). Wetland 2 rates as a Category II.	
Wetland Buffers		
Buffer Condition	Buffers east of the wetland are dominated by an herbaceous community of primarily introduced grasses and other forb species. Native woody saplings and shrubs are also present with several scattered Scotch broom. A small clump of Douglas-fir is present in the buffer. The buffer provides limited buffering functions for habitat and water quality. The small woody plant community does provide some screening functions. The wetland is bordered by the tidal water of Mud Bay to the west.	

4.4. Streams

McAllister Creek, a tributary to the Nisqually Estuary in Nisqually Reach, in south Puget Sound, was identified within the project limits (Tables 8 and 9). This perennial stream flows from south to north through the project. The reach of the creek in the project study area is tidally influenced and confined within the banks of a dike lined with sackcrete and rip rap armoring. Salt tolerant herbaceous plants line the banks of the creek from the mouth of the creek at the estuary, through the project, and for a significant distance up-stream and south of the project. The project occurs at the lowest reach of the creek before meeting the mud flats of the Nisqually Estuary. The headwaters of the creek occur in a spring fed, headwater wetland complex known as Medicine Springs or McAllister Spring approximately 2.5 linear miles south of the creeks confluence with the estuary. This perennial stream is mapped as a DNR Water Type S or designated shoreline of the state (DNR 2021a). WDFW data shows McAllister Creek has documented fish use by chinook, chum, coho, pink, sockeye, steelhead, and resident cutthroat (WDFW 2021b).

Table 8. Streams within the project corridor.

Stream Name	DNR Water Type[a]	Thurston County[b] Buffer Width (feet)
McAllister Creek	S	250

[a] DNR Water Types: Type S = shoreline of the state (DNR 2021a).
[b] Thurston County buffers applied (Thurston County 2021b).

Table 9. McAllister Creek summary.

MCALLISTER CREEK - INFORMATION SUMMARY		
	**Stream Name**	McAllister Creek
	Long./Lat. ID Number	1227271470864
	WRIA Name/Stream #	McAllister Creek / 11.0324
	Local Jurisdiction	Thurston County
	DNR Water Type/SMP	S
	Buffer Width	250 feet
	Documented Fish Use[a]	chinook, chum, coho, pink, sockeye, steelhead, resident cutthroat
Location of Stream Relative to Project Corridor	McAllister Creek passes through the project flowing from south to north under the I-5 McAllister Creek Bridges and then flows through the project limits, north to the Nisqually Estuary in Nisqually Reach, south Puget Sound.	
Connectivity	The headwaters of McAllister Creek originate south of the project in a spring fed, headwater wetland complex approximately 2.5 linear miles south of the project. The creek flows through mixed forested and shrub dominated wetland areas in its upper reaches, then through agricultural lands, with its lower reaches encompassed by dike walls which experience tidal water intrusion during high tide cycles. Just downstream of the project, the creek mees the mud flats of the extensive Nisqually Estuary, where the flow of McAllister Creek forms a channel well out into the estuarine mudflats.	
Fish Habitat	McAllister Creek provides habitat for several salmonids and other fish, despite the altered landscape including diking and lack of riparian vegetation. In addition to presence of several salmonids, spawning for winter chum is documented in the creek (WDFW 2021b). McAllister Creek is designated critical habitat for Puget Sound steelhead (NOAA 2021c).	
Riparian/Buffer Condition	In the immediate vicinity of the project the creek lacks a functional buffer. The dike walls grade up to fill material supporting transportation infrastructure.	

[a] Documented fish species known to occur in the stream from available data sources (WDFW 2021b).

4.5. High Tide Line

Field indicators in relation to HPT were used to place the HTL at an elevation of 16.25 feet relative to mean lower low water (MLLW) of 0 at Budd Inlet, South of Gull Harbor Station 9446807 at both I-5 McAllister Creek Bridges and US 101 Mud Bay Bridges. The observed HTL field indicators matched the 10-year average of the HPT of 16.25 feet. The PEO applied the 16.25 foot elevation of HTL across both sites based on topographic elevations. Field indicators (Figure 7; Figure 8), summary of HTL info (Table 10; Table 11), 10-year average HPT data (Appendix E), and plan sheets showing HLT boundary (Appendix F) are provided.

Prior to field work, biologists reviewed the mean elevation of HPT over a 10-year period for Budd Inlet, Washington between January 1, 2021 and December 31, 2030. The HPT for this time period is 16.25 feet elevation (NOAA 2021b). The higher high tide for the April 19, 2021 field visit at I-5 McAllister Creek Bridges occurred at 12:04 am, prior to the field visit, and was predicted to be a 12.94-foot tide. The higher high tide for the April 6, 2021 field visit at US 101 Mud Bay Bridges occurred at 2:50 am, prior to the field visit, and was predicted to be a 13.65-foot tide.

To locate the HTL at I-5 McAllister Creek Bridges biologists found field indicators of the 12.94-foot higher high tide line on the day of field work and estimated an additional 3.31 feet up from that point to find the HPT elevation of 16.25 feet. To locate the HTL at US 101 Mud Bay Bridges biologists found field indicators of the 13.65-foot higher high tide line on the day of field work and estimated an additional 2.6 feet up from that point to find the HPT elevation of 16.25 feet. Once the HPT elevation was determined at each site, biologists searched for HTL field indicators, and at both sites confirmed field indicators correlated with the HPT elevation.

The estimated HPT at both locations correlated with HTL indicators (Figure 7; Figure 8). The HTL was placed at the HPT elevation of 16.25 feet.

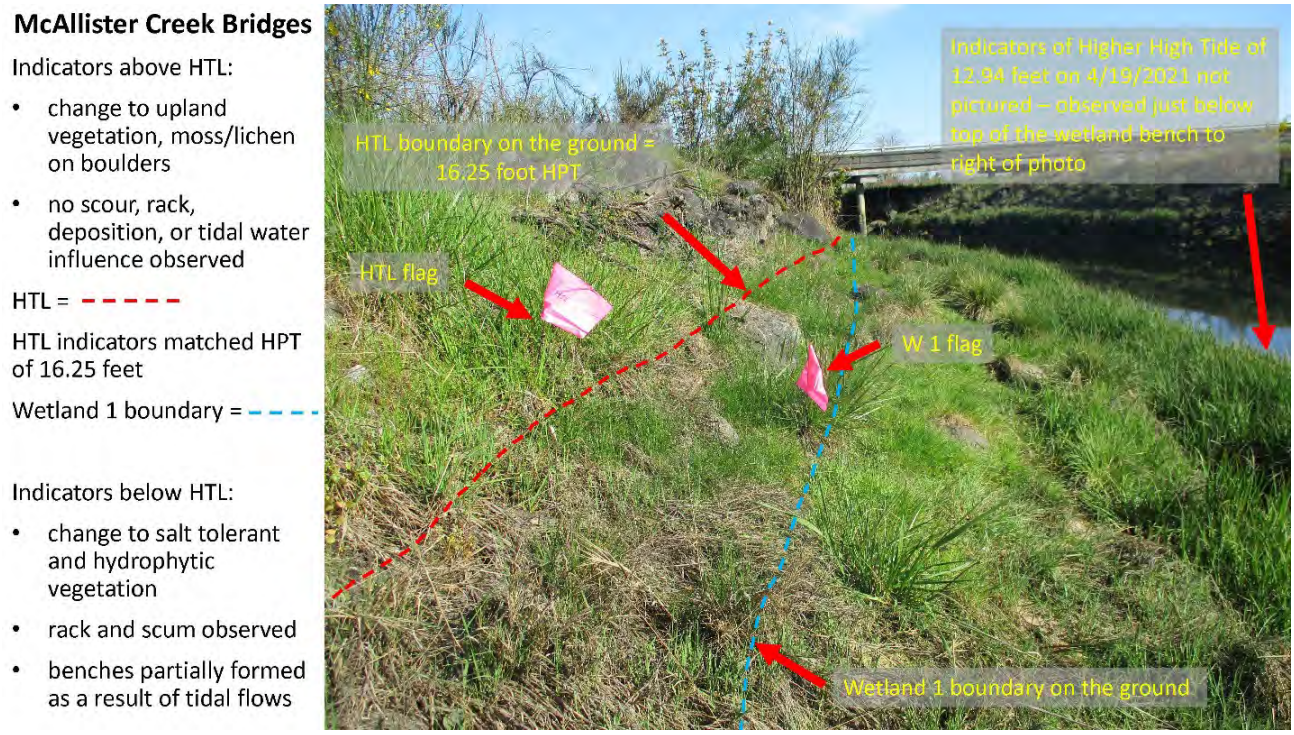

Figure 7. HTL field determination explanation I-5 McAllister Creek Bridges.

Table 10. HTL summary I-5 McAllister Creek Bridges.

HTL I-5 MCALLISTER CREEK BRIDGES - INFORMATION SUMMARY		
	**Waterbody Name**	Nisqually Flats, Nisqually Reach
	Local Jurisdiction	Thurston
	WRIA	11 – Nisqually
	Thurston Co. SMP shoreline designation[a]	"natural environment"
	HTL elevation[b]	16.25 feet
	Buffer Width	250 feet
	HTL Relative to Project Corridor	HTL is perpendicular to I-5 bridges and I-5 SB on-ramp bridge
Field Observations		
Field Indicators	Above the HTL: • Change to upland vegetation including Scotch broom, sweet vernalgrass (*Anthoxanthum odoratum*), common velvetgrass (*Holcus lanatus*), and orchard grass (*Dactylis glomerata*). Moss/lichen on boulders. • No scour, rack, deposition, or tidal water influence observed. Below the HTL: • Change to salt tolerant and hydrophytic vegetation, including Lyngbye's sedge, inland saltgrass, and pickleweed. • Rack and scum observed. • Benches partially formed as a result of tidal flows, indicated by sluffing and rivulets/drainage patters in depressions. (Figure 7)	
HTL Buffer Condition	Buffers are present west of the wetland but are primarily disturbed herbaceous grass and forb communities formed on fill between the I-5 main line and SB on ramp and provide little buffer function. The buffer also includes a maintenance access road and parking turn around further limiting buffer functions. Buffers are present east of the HTL on the dike. Buffers are disturbed and provide little buffering function. Vegetation is a mix of native and introduced herbaceous species with some Scotch broom individuals scattered.	

[a] SMP environmental designation.

[b] HTL elevation relative to MLLW of 0 at Budd Bay, South of Gull Harbor, WA Station 9446807.

Mud Bay Bridges

Indicators above HTL:

- different soil (gravel/fill vs. fine textured silt)
- change to upland vegetation
- no scour, rack, deposition, or tidal water influence observed

HTL = - - - - -

HTL shown by the red dashed line and at the base of the shovel. HTL indicators matched HPT of 16.25 feet

Wetland 1 boundary = - - - - -

Pencil indicates tidal elevation of higher high tide on date of field work, estimated at 13.36 feet

Indicators below HTL:

- different soil (fine textured silt vs. gravel/fill)
- change to salt tolerant and hydrophytic vegetation, and seaweed
- rack, deposition of fines, tidal water influence observed

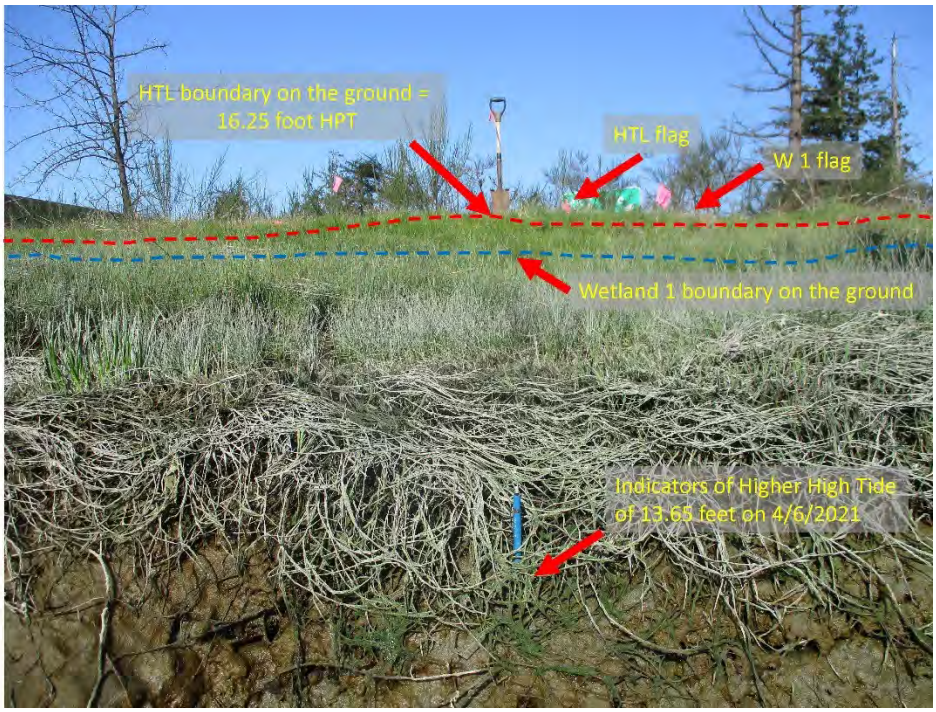

Figure 8. HTL field determination explanation US 101 Mud Bay Bridges.

Table 11. HTL summary US 101 Mud Bay Bridges.

<table>
<tr><th colspan="3">HTL I-5 MUD BAY BRIDGES - INFORMATION SUMMARY</th></tr>
<tr><td colspan="2" rowspan="6">  </td><td>Waterbody Name</td><td>Mud Bay, Eld Inlet</td></tr>
<tr><td>Local Jurisdiction</td><td>Thurston</td></tr>
<tr><td>WRIA</td><td>13 – Deschutes</td></tr>
<tr><td>Thurston Co. SMP shoreline designation[a]</td><td>“conservancy environment”</td></tr>
<tr><td>HTL elevation[b]</td><td>16.25 feet</td></tr>
<tr><td>Buffer Width</td><td>250 feet</td></tr>
<tr><td colspan="2">HTL Relative to Project Corridor</td><td>HTL is perpendicular to US 101.</td></tr>
<tr><th colspan="3">Field Observations</th></tr>
<tr><td>Field Indicators</td><td colspan="2">Above HTL:
Different soil (gravel/fill vs. fine textured silt).
Change to upland vegetation, including Scotch broom and narrowleaf plantain (Plantago lanceolata).
No scour, rack, deposition, or tidal water influence observed at or above HTL.
Below HTL:
Different soil (fine textured silt vs. gravel/fill)
Change to salt tolerant and hydrophytic vegetation, and seaweed including black rush, pickleweed, and inland saltgrass.
Rack, deposition of fines, tidal water influence observed.
Aquatic invertebrates.
(Figure 8)</td></tr>
<tr><td>HTL Buffer Condition</td><td colspan="2">Buffers east and west of the HTL are dominated by an herbaceous community of primarily introduced grasses and other forb species. Some trees and shrubs are present including a small clump of Douglas-fir on the eastern shore. Scotch broom and Himalayan blackberry are also scattered. The buffer provides limited buffering functions for habitat, water quality, and screening.</td></tr>
</table>

[a] SMP environmental designation.

[b] HTL elevation relative to MLLW of 0 at Budd Bay, South of Gull Harbor, WA Station 9446807.

4.6. Species and Habitats of Interest

A separate BA will be prepared to address potential impacts to federally listed threatened or endangered species and proposed and designated critical habitat. The following information is a cursory look at potential ESA species and habitats that may occur in the project. In addition, information on sensitive or unique wildlife, plants, and habitats occurring in Washington State is provided.

I-5 McAllister Creek Bridges

Salmonids and steelhead federally listed as threatened under ESA have potential presence in the I-5 McAllister Creek Bridges study area including evolutionarily significant unit (ESU) Puget Sound chinook and distinct population segment (DPS) Puget Sound steelhead. The reach of McAllister Creek bisecting the study area is chinook designated critical habitat (NOAA 2021c). The site occurs in essential fish habitat for the following salmonids: chinook, coho, Puget Sound pink (NOAA 2021a).

Other than ESA-listed fish, other federally listed endangered, threatened, or candidate species are not known to occur within the study area (WDFW 2021c).

The Washington State Department of Natural Resources, Washington Natural Heritage Program (WNHP) identifies Washington State threatened, endangered, and sensitive plants. The WNHP database does not show any of these plant species in or adjacent to the study area (DNR 2021b).

The WNHP also documents Wetlands of High Conservation Value. DNR documents these sensitive areas associated with the Billy Frank Jr. Nisqually Wildlife Refuge, less than half mile to the north and northeast of the study area (DNR 2021c).

WDFW data indicates that PHS are present within the study area and within one mile of the study area (WDFW 2021a). Within the study area PHS presence includes waterfowl concentrations. Within one mile PHS presence includes: Western Pond Turtle (*Actinemys marmorata*), Oregon vesper sparrow (*Pooecetes gramineus*), Mountain quail (*Oreortyx pictus*), Pileated woodpecker (*Dryocopus pileatus*), Western gray squirrel (*Sciurus griseus*), wood duck (*Aix sponsa*) nesting and brood areas, band-tailed pigeon (*Patagioenas fasciata*), wetlands, sloughs, and biodiversity areas and corridors.

US 101 Mud Bay Bridges

Federally listed threatened salmonids and steelhead have potential presence in the US 101 Mud Bay Bridges study area including ESU Puget Sound chinook and DPS Puget Sound steelhead. Chinook nearshore designated critical habitat is present in the tidally influenced areas of the study area (NOAA 2021c). The site occurs in essential fish habitat for finfish, coastal pelagic species, and groundfish (NOAA 2021a).

Other than ESA-listed fish, other federally listed endangered, threatened, or candidate species are not known to occur within the wetlands or other areas within the study area (WDFW 2021c).

The WNHP database does not show any Washington State threatened, endangered, and sensitive plants plant species (DNR 2021b) or Wetlands of High Conservation Value (DNR 2021c) in or adjacent to the study area.

WDFW data indicates that PHS are present within the study area and within one mile of the study area (WDFW 2021a). Within the study area PHS presence includes shorebird concentrations and lagoons. Within one mile of the study area PHS additionally includes sloughs, wetlands, estuaries, Yuma myotis (*Myotis yumanensis*), little brown bat (*Myotis lucifugus*), and big brown bat (*Eptesicus fuscus*).

5. Limitations

This wetland and stream assessment report documents the investigation, best professional judgment, and conclusions of WSDOT based on the site conditions encountered at the time of this study. The wetland, stream, and HTL delineations were performed in compliance with accepted standards for professional wetland biologists and applicable federal, state, and local laws and ordinances, and WSDOT policies and guidance. The information contained in this report is correct and complete to the best of our knowledge. It should be considered a preliminary jurisdictional determination of wetlands and other waters until it has been reviewed and approved in writing by the appropriate jurisdictional authorities. The final determination of the wetland and other waters boundaries, classifications, required setback, and buffer will be made by local, state, and federal jurisdictions.

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Appendix A. Background Information

Appendix A includes the following sub-appendices:

A-1 Comparison of Observed and Normal Precipitation for Olympia, Washington

A-2 Daily Precipitation for 10 Days Preceding Fieldwork, Olympia, Washington

A-3 USGS Topographic Map

A-4 National Wetland Inventory Map

A-5 NRCS Soil Survey Map

A-6 Aerial photograph, Washington 1ft 2019, 4 band, Statewide Imagery

Appendix A-1. Comparison of Observed and Normal Precipitation

The Regional Delineation Supplement Version 2.0 (USACE 2010) recommends using methods described in Chapter 19 in Engineering Field Handbook (NRCS 2015) to determine if precipitation occurring in the three full months prior to the site visit was normal, drier than normal, or wetter than normal. Actual rainfall is compared to the normal range of the 30-year average. The following table shows this information.

Monthly precipitation data for Olympia, Washington for the April 6, 2021 field visit at US 101 Mud Bay Bridges and the April 19, 2021 field visit at I-5 McAllister Creek Bridges.

		Long-term rainfall records[a]							
	Month	**3 yrs. in 10 less than**	**Average**	**3 yrs. in 10 more than**	**Rain fall[a]**	**Condition dry, wet, normal[b]**	**Condition Value**	**Month weight value**	**Product of previous two columns**
1st prior month	Mar	3.91	5.29	6.20	3.01	D	1	3	3
2nd prior month	Feb	3.92	6.17	7.44	7.84	W	3	2	6
3rd prior month	Jan	4.76	7.54	9.10	12.22	W	3	1	3
								Sum	**12**

[a] NRCS 2021a
[b] Conditions are considered normal if they fall within the low and high range around the average.

Note:	If sum is	Condition value:	
	6 - 9 then prior period has been drier than normal	Dry (D)	= 1
	10 - 14 then period has been normal	Normal (N)	= 2
	15 - 18 then period has been wetter than normal	Wet (W)	= 3

Conclusions: Normal precipitation conditions were present prior to the two April 2021 field visits.

Appendix A-2. Daily Precipitation for 10 Days Preceding Fieldwork, Olympia, Washington

To determine if light, moderate, or heavy precipitation occurred in the 10 days prior to field work, the 10 day total is compared to 1/3 of the monthly average precipitation for the month evaluated.

Daily precipitation data preceding US 101 Mud Bay Bridges April 6, 2021 field visit.

Date (2021)	Daily Precipitation (inches)[a]
April 5	0.00
April 4	0.04
April 3	0.00
April 2	0.00
April 1	0.00
Mar 31	0.00
Mar 30	0.00
Mar 29	T
Mar 28	0.63
Mar 27	0.00
Sum	**0.67**

[a] NRCS 2021a, "T" indicates trace amounts of precipitation were recorded.

Conclusions: Light precipitation was recorded in the ten days preceding field work.

Daily precipitation data preceding I-5 McAllister Creek Bridges April 19, 2021 field visit.

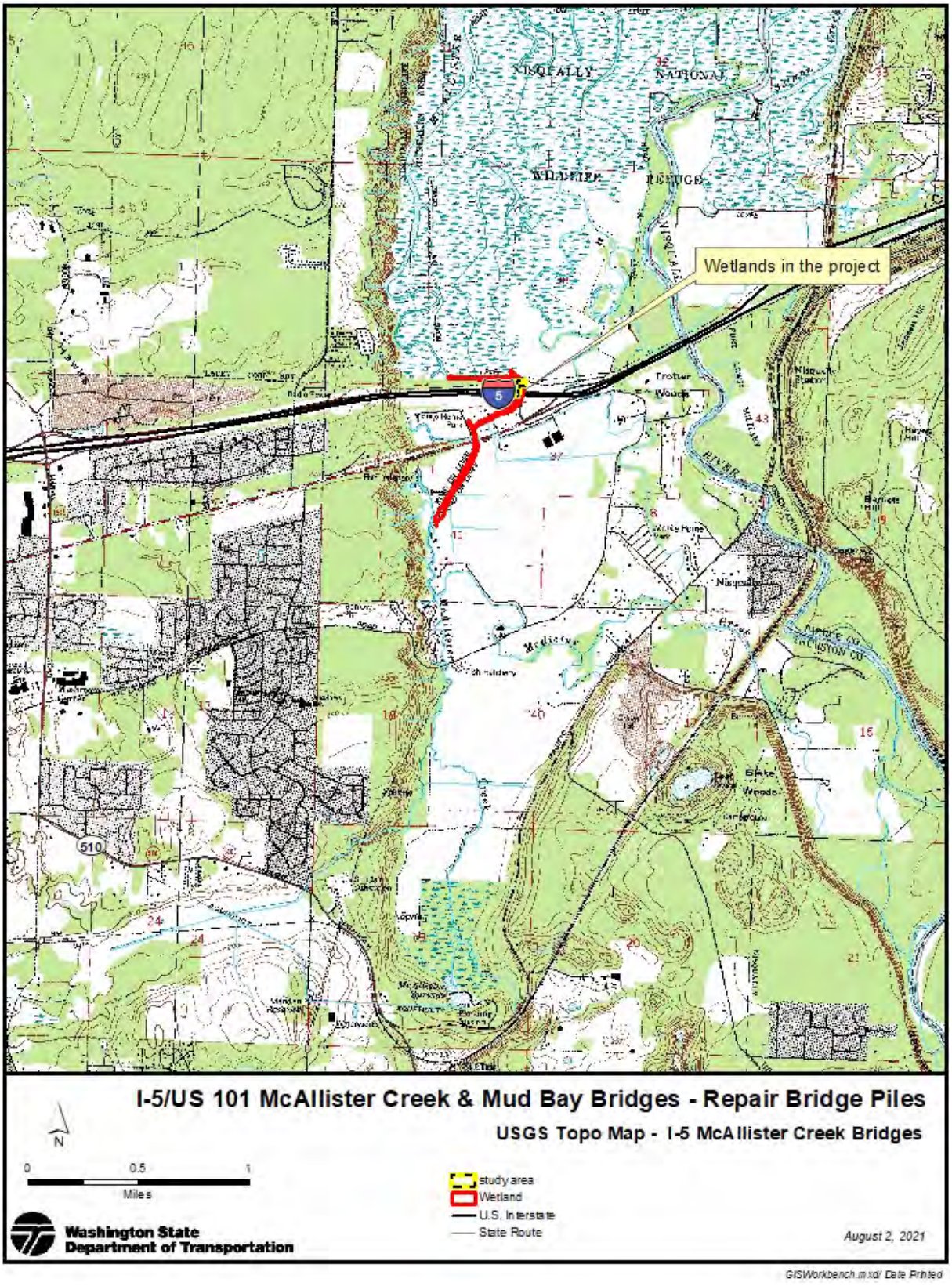
Date (2021)	Daily Precipitation (inches)[a]
April 18	0.00
April 17	0.00
April 16	0.00
April 15	0.00
April 14	0.00
April 13	0.00
April 12	0.00
April 11	0.00
April 10	0.07
April 9	0.08
Sum	**0.15**

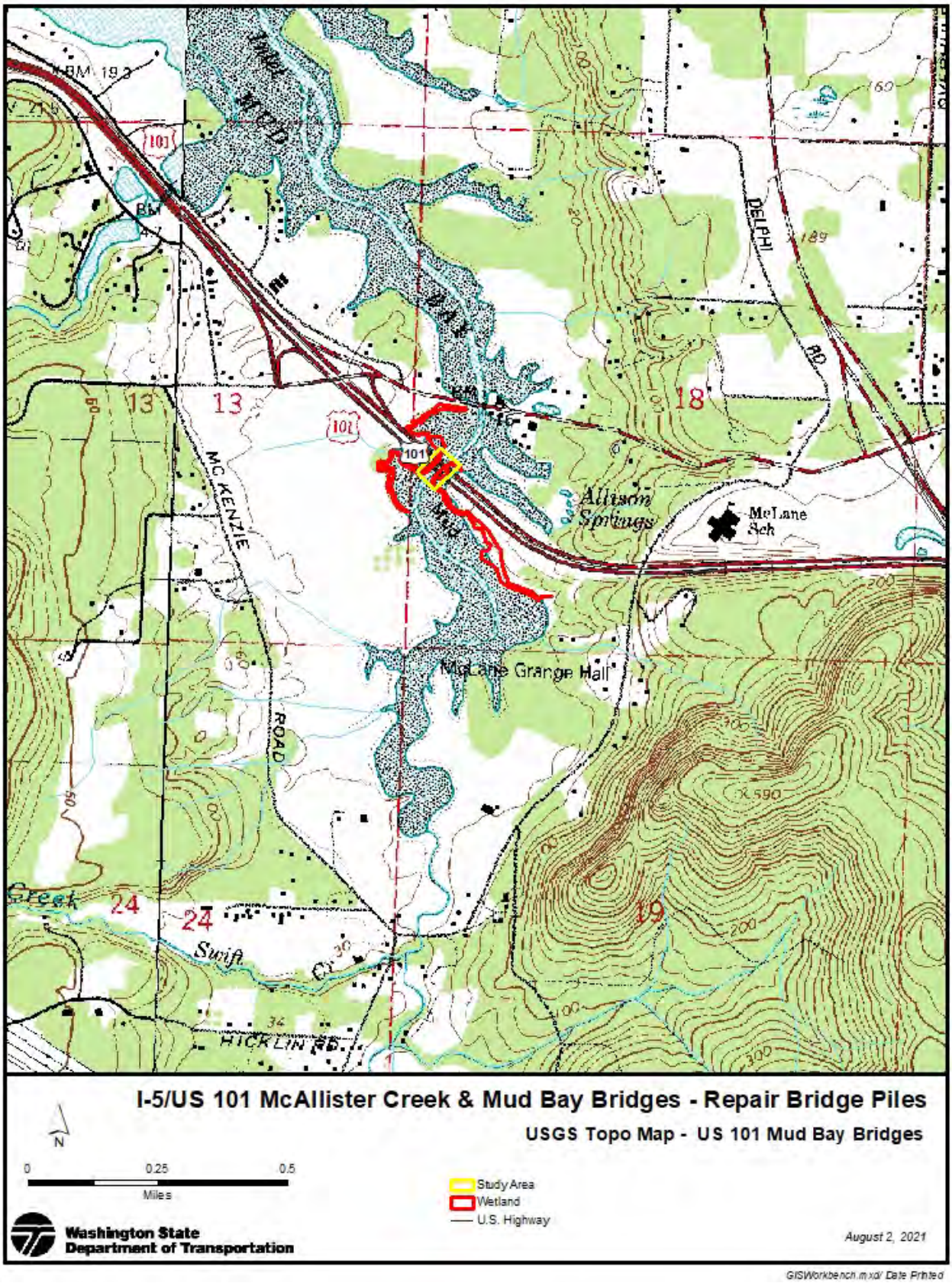
[a] NRCS 2021a

Conclusions: Light precipitation was recorded in the ten days preceding field work.

Appendix A-3. USGS Topographic Map

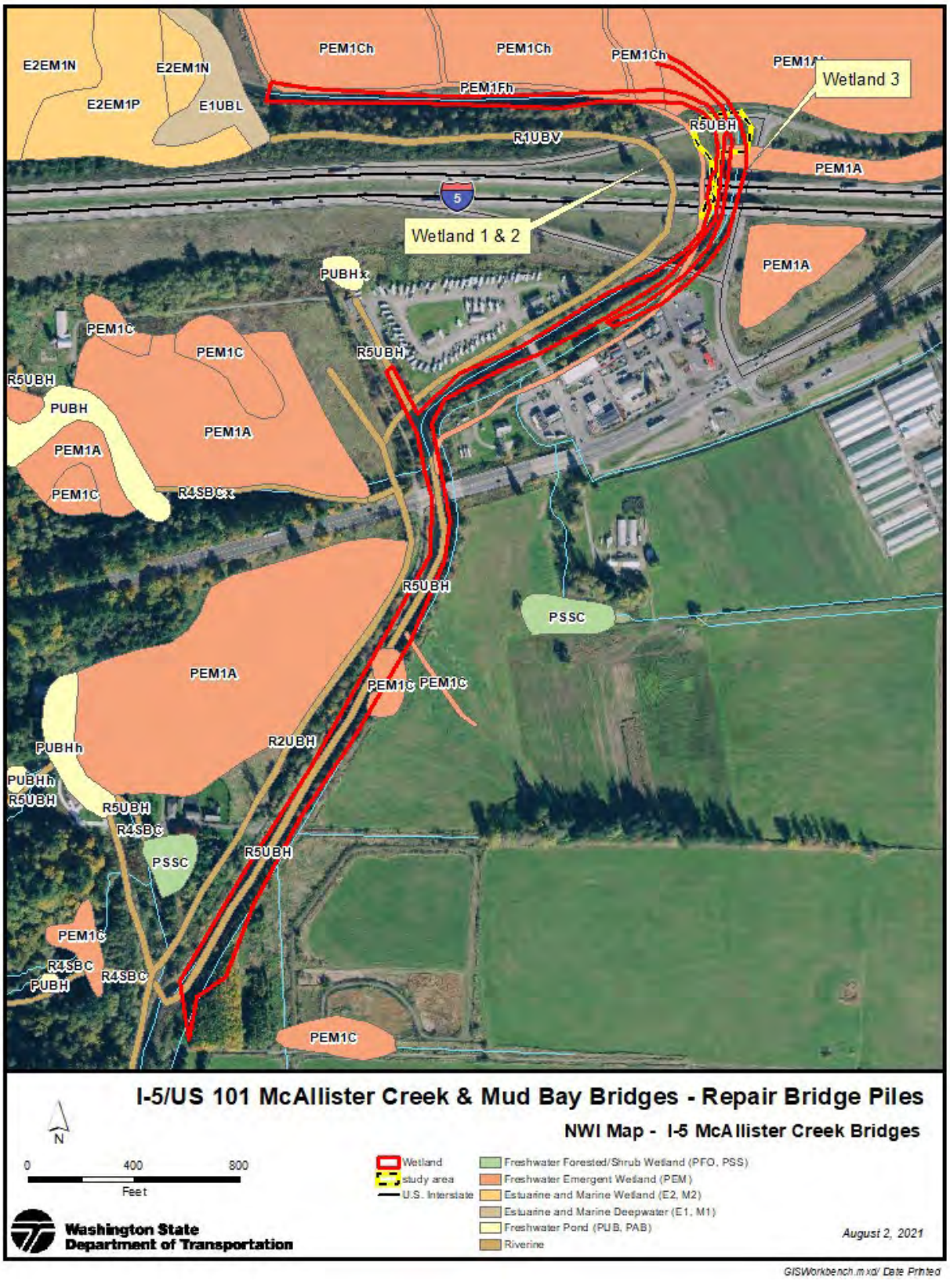
I-5 McAllister Creek Bridges

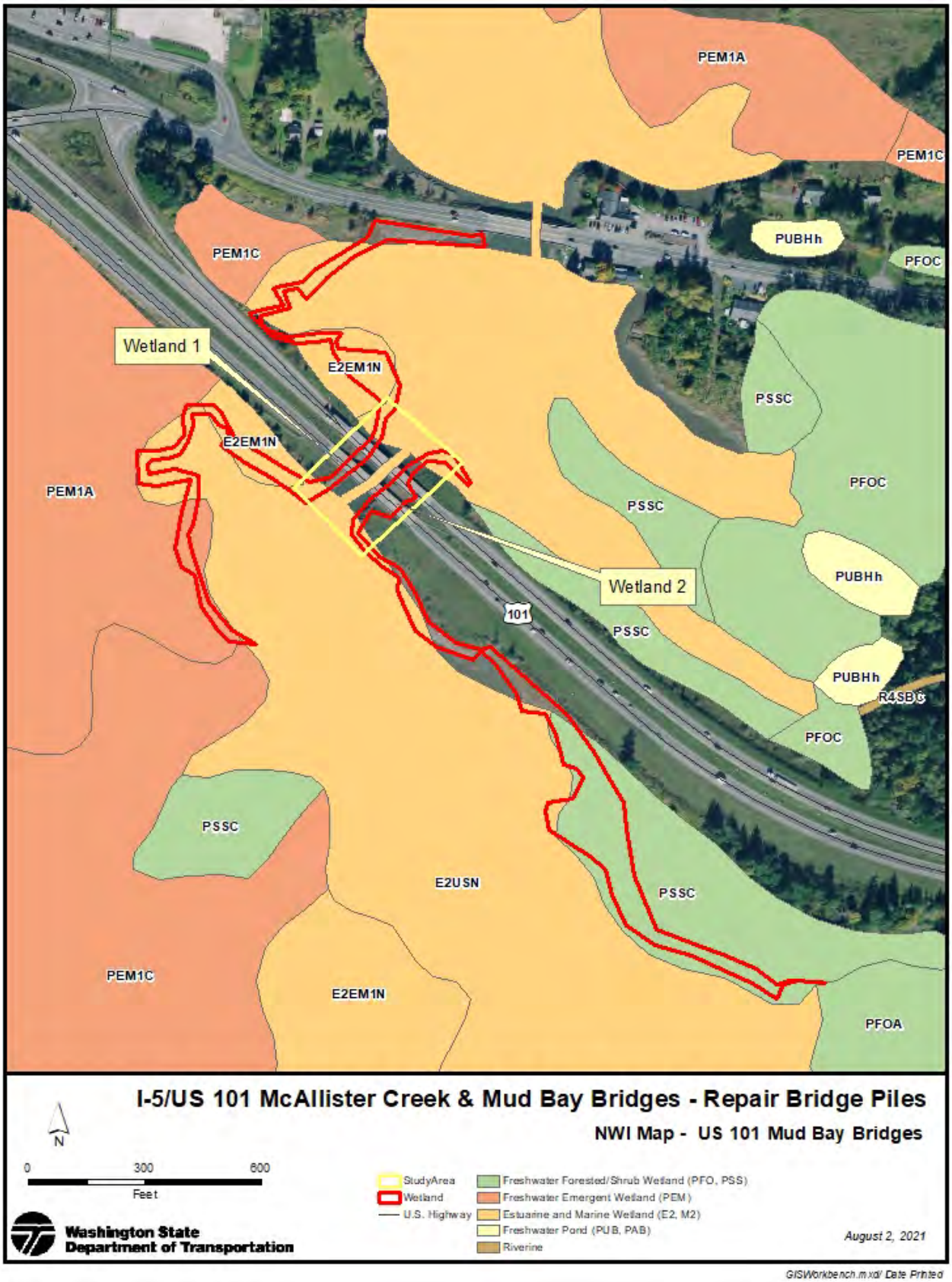



I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
USGS Topo Map - US 101 Mud Bay Bridges
N
0
0.25
0.5
Miles
Study Area
Wetland
U.S. Highway
Washington State Department of Transportation
August 2, 2021
GISWorkbench.mxd/ Date Printed
Allison Springs
McLane Sch
McLane Grange Hall
MC KENZIE ROAD
DELPHI RD
HICKLIN RD.
Swift Cr
101
13
18
19
24

Appendix A-4. National Wetland Inventory Map

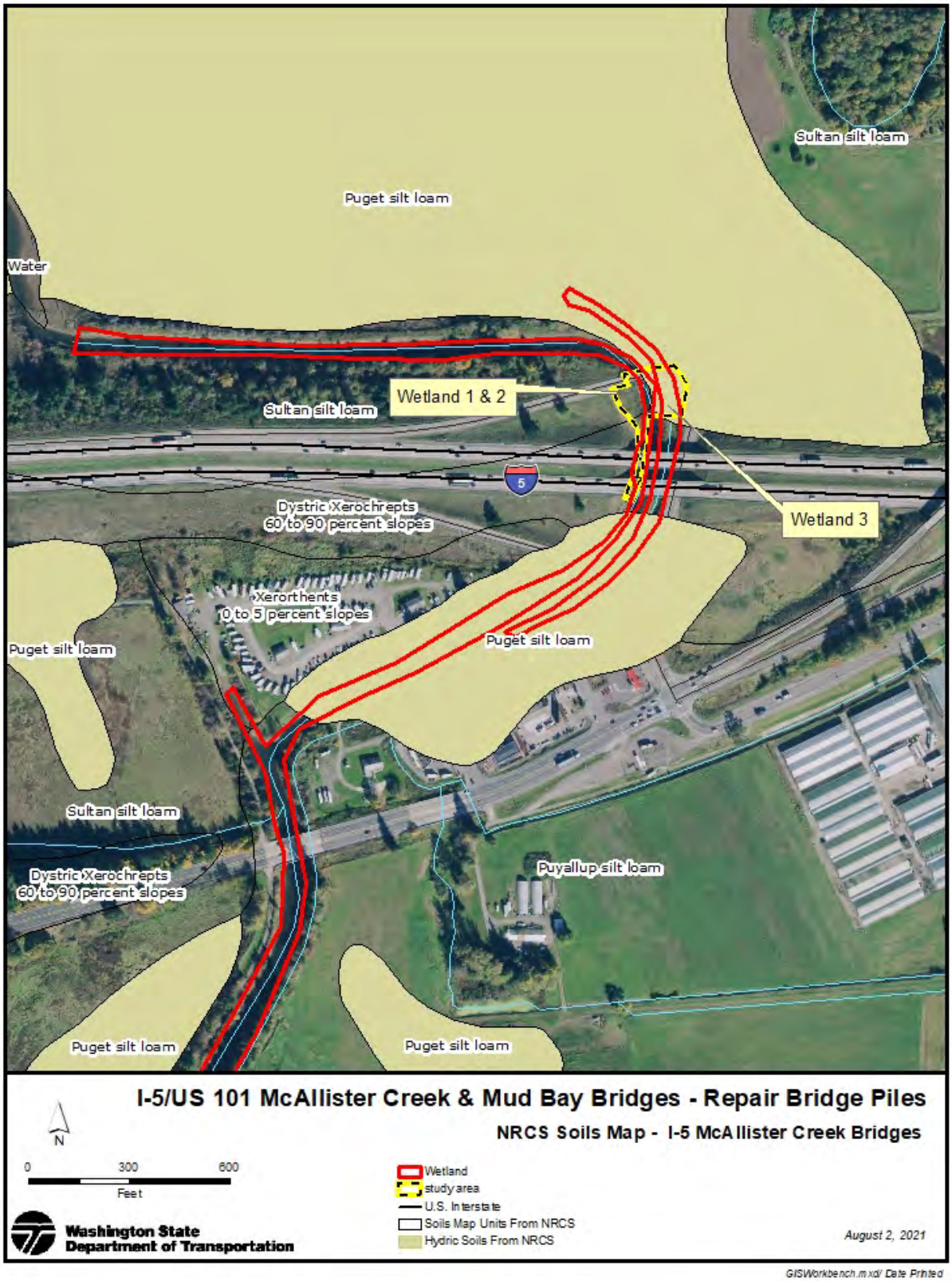
I-5 McAllister Creek Bridges

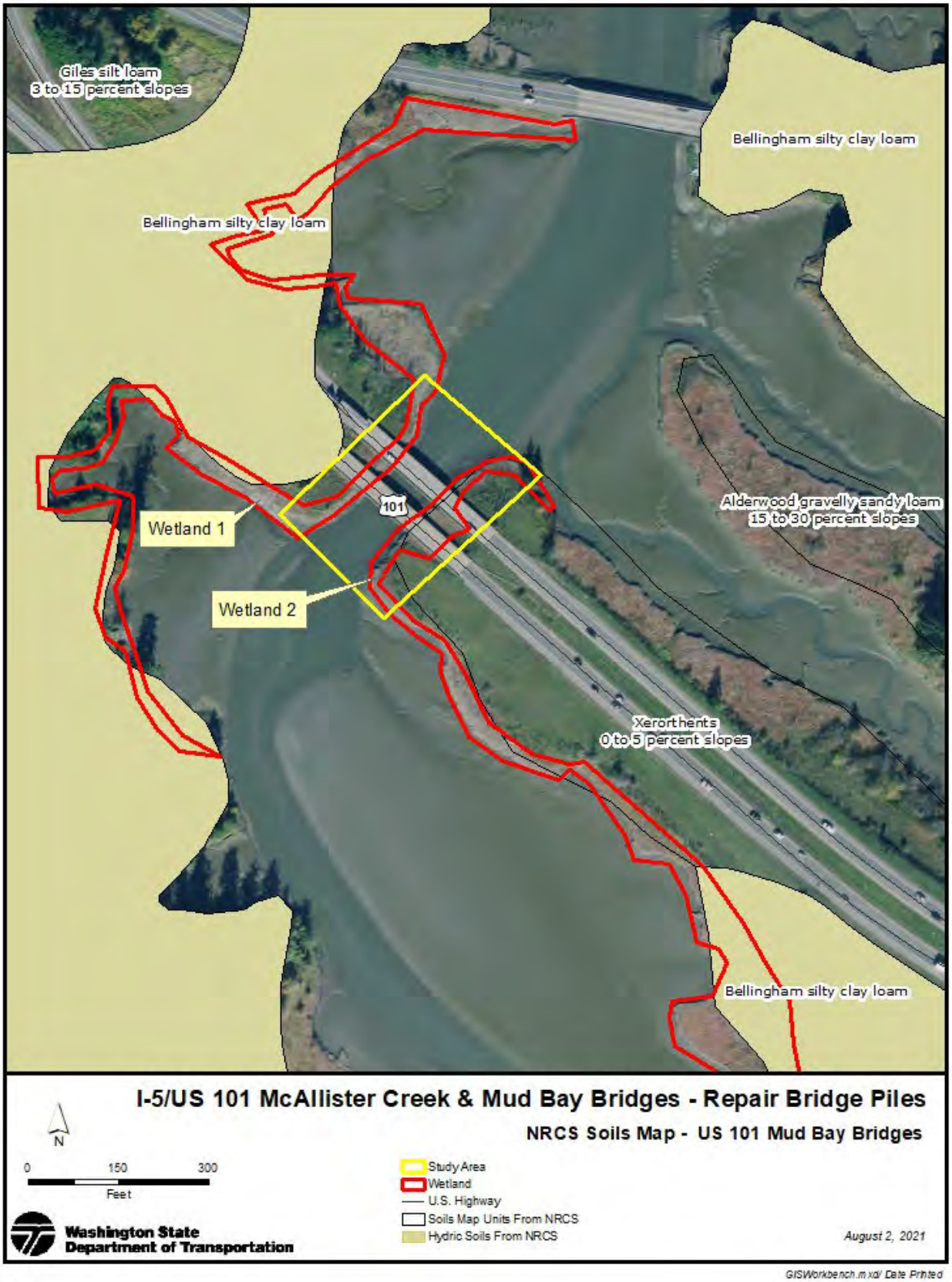



PEM1A
PEM1C
PUBHh
PFOC
PEM1C
Wetland 1
E2EM1N
PSSC
E2EM1N
PEM1A
PFOC
PSSC
Wetland 2
PUBHh
101
PSSC
PUBHh
R4SBC
PFOC
PSSC
E2USN
PSSC
PEM1C
E2EM1N
PFOA
I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
NWI Map - US 101 Mud Bay Bridges
N
0
300
600
Feet
StudyArea
Wetland
U.S. Highway
Freshwater Forested/Shrub Wetland (PFO, PSS)
Freshwater Emergent Wetland (PEM)
Estuarine and Marine Wetland (E2, M2)
Freshwater Pond (PUB, PAB)
Riverine
Washington State Department of Transportation
August 2, 2021
GISWorkbench.mxd Date Printed

Appendix A-5. NRCS Soil Survey Map

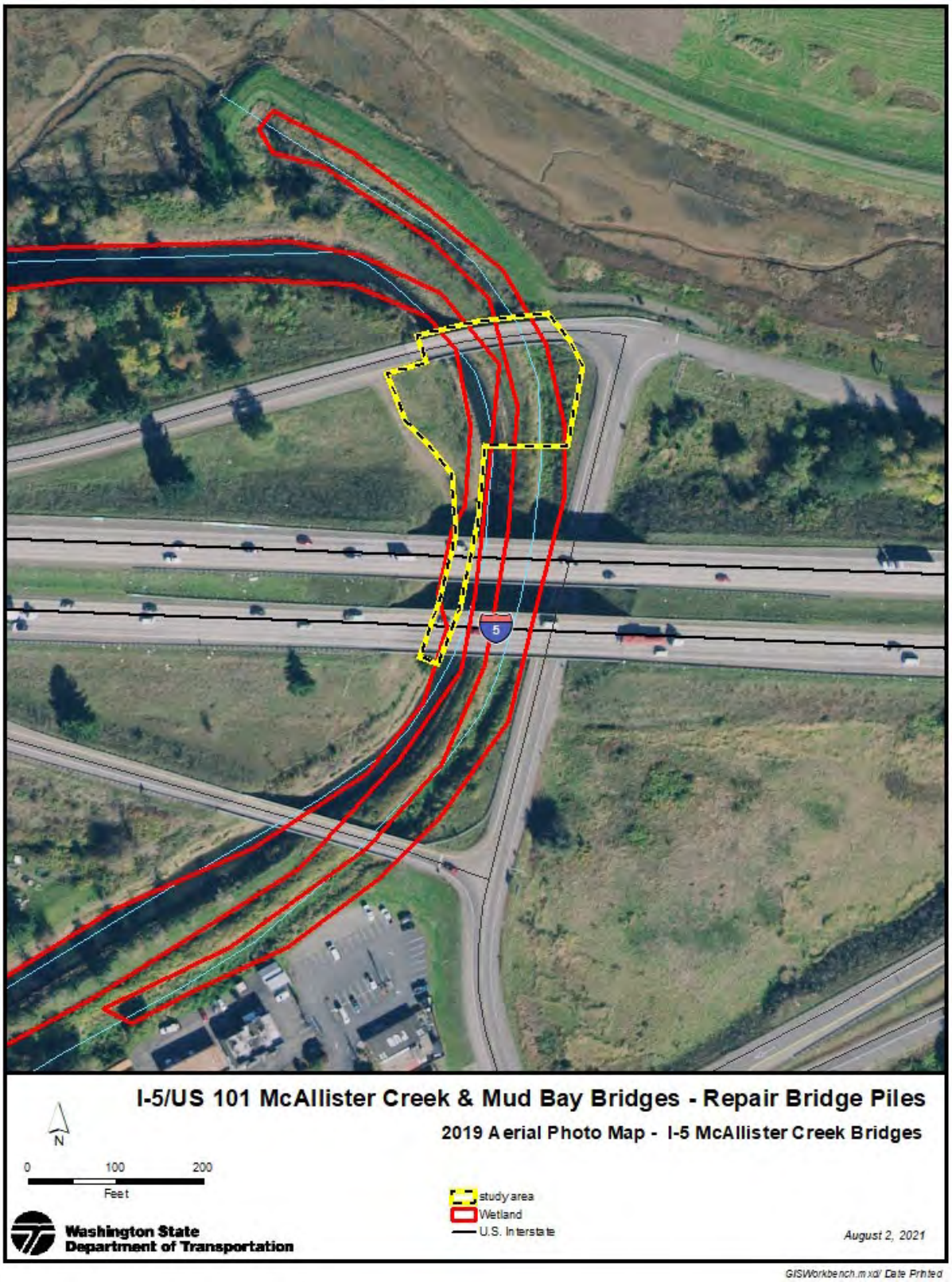
I-5 McAllister Creek Bridges



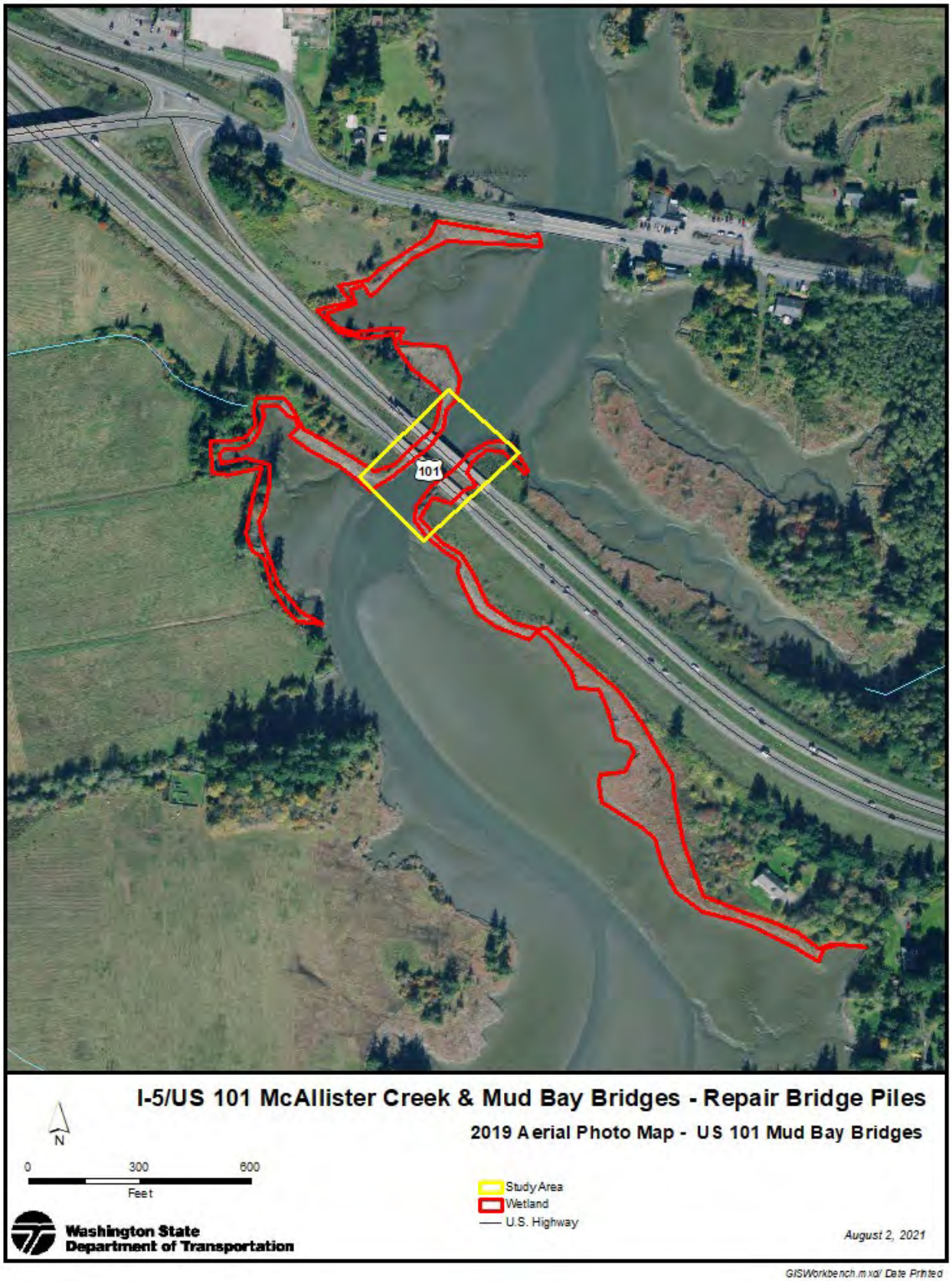

Giles silt loam
3 to 15 percent slopes
Bellingham silty clay loam
Bellingham silty clay loam
Alderwood gravelly sandy loam
15 to 30 percent slopes
101
Wetland 1
Wetland 2
Xerorthents
0 to 5 percent slopes
Bellingham silty clay loam
I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
NRCS Soils Map - US 101 Mud Bay Bridges
N
0
150
300
Feet
Study Area
Wetland
U.S. Highway
Soils Map Units From NRCS
Hydric Soils From NRCS
Washington State
Department of Transportation
August 2, 2021
GISWorkbench.mxd Date Printed

Appendix A-6. Aerial Photograph of Study Area, Washington 1ft 2019, 4 band, Statewide Imagery

I-5 McAllister Creek Bridges



US 101 Mud Bay Bridges



Appendix B. Wetland Delineation Data Sheets

Appendix B includes the following sample point data sheets:

I-5 McAllister Creek Bridges

W1-SP1

W1-SP2

W2-SP1

W2-SP2

W3-SP1

W3-SP2

US 101 Mud Bay Bridges

W1-SP1

W1-SP2

W2-SP1

W2-SP2

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

Project/Site: I-5 McAllister Creek Bridges - Repair Bridge Piles | City/County: n/a / Thurston | Sampling Date: 4/19/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W1-SP1

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: DLC38, T18N, R1E

Landform (hillslope, terrace, etc.): estuarine diked river bench | Local relief (concave, convex, none): concave | Slope (%): 5

Subregion (LRR): A | Lat: 47.068 | Long: -122.72 | Datum: NAD83HARN

Soil Map Unit Name: Dystric Xerochrepts, 60 to 90 percent slopes | NWI Classification: none

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

Are Vegetation [ ], Soil [✓], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:
See soils remarks for information on significantly disturbed soils.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 5ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 5ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Carex lyngbyei*	80	**Y**	74.8	OBL
2. *Distichlis spicata*	10	N	9.3	FACW
3. *Salicornia pacifica*	10	N	9.3	OBL
4. *Deschampsia caespitosa*	5	N	4.7	FACW
5. *Atriplex patula*	2	N	1.9	FACW
6.				
7.				
8.				
9.				
10.				
11.				
	107 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	17	x 2 =	34
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	107 (A)		124 (B)

Prevalence Index = B/A = 1.159

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:

SOIL

Sampling Point: W1-SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ◉ Yes ○ No

Remarks:

Problematic hydric soils are present. Soils are significantly disturbed. Although soils were not ovserved, problematic hydric soil are present because the wetland occurs on a dike retaining wall made of a sackcrete. The area has hydrophytic vegetation present and receives daily tidal water, as well as seasonal and occasional riverine hydrologic inputs.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:

Barnacles and seaweed also present. Surface water to 4 inches in shallow erosional small depressions and rivulets on the riverine bench.

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

Project/Site: I-5 McAllister Creek Bridges - Repair Bridge Piles | City/County: n/a / Thurston | Sampling Date: 4/19/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W1-SP2

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: DLC38, T18N, R1E

Landform (hillslope, terrace, etc.): terrace above dike wall | Local relief (concave, convex, none): concave | Slope (%): 5

Subregion (LRR): A | Lat: 47.068 | Long: -122.72 | Datum: NAD83HARN

Soil Map Unit Name: Dystric Xerochrepts, 60 to 90 percent slopes | NWI Classification: none

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

Are Vegetation [ ], Soil [✓], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	( ) Yes	(●) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:
Soils are significantly disturbed. Fill soil in the area. Soils were not examined due to fill.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 10ft x 10ft)				
1. *Cytisus scoparius*	10	**Y**	100.0	UPL
2.				
3.				
4.				
5.				
	10 = Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Anthoxanthum odoratum*	65	**Y**	64.4	FACU
2. *Holcus lanatus*	15	N	14.9	FAC
3. *Dactylis glomerata*	10	N	9.9	FACU
4. *Plantago lanceolata*	5	N	5.0	FACU
5. *Achillea millefolium*	3	N	3.0	FACU
6. *Hypochaeris radicata*	3	N	3.0	FACU
7.				
8.				
9.				
10.				
11.				
	101 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	86	x 4 =	344
UPL species	10	x 5 =	50
Column Totals:	111 (A)		439 (B)

Prevalence Index = B/A = 3.955

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:

SOIL

Sampling Point: W1-SP2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:

Soils are significantly disturbed. Fill soil in the area. Soils were not examined due to fill. The vegetation community dominated by non-hydrophytes, the lack of hydrology indicators, and landscape position suggest soils are not hydric even though they could not be observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

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

Project/Site: I-5 McAllister Creek Bridges - Repair Bridge Piles | City/County: n/a / Thurston | Sampling Date: 4/19/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W2-SP1

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: DLC38, T18N, R1E

Landform (hillslope, terrace, etc.): estuarine dike wall | Local relief (concave, convex, none): concave | Slope (%): 20

Subregion (LRR): A | Lat: 47.069 | Long: -122.72 | Datum: NAD83HARN

Soil Map Unit Name: Pugest silt loam | NWI Classification: riverine

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:
See soils remarks for information on significantly disturbed soils.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 10ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 10ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Carex lyngbyei*	60	**Y**	75.0	OBL
2. *Salicornia pacifica*	10	N	12.5	OBL
3. *Potentilla anserina*	5	N	6.3	OBL
4. *Deschampsia caespitosa*	5	N	6.3	FACW
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	80 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	5	x 2 =	10
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		85 (B)

Prevalence Index = B/A = 1.063

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:

SOIL

Sampling Point: W2-SP1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ◉ Yes ○ No

Remarks:

Problematic hydric soils are present. Soils are significantly disturbed. Although soils were not ovserved, problematic hydric soil are present because the wetland occurs on a dike retaining wall made of a sackcrete. The area has hydrophytic vegetation present and receives daily tidal water, as well as seasonal and occasional riverine hydrologic inputs.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:

Did not dig to examine subsurface hydrology indicators such as soil saturation or a high water table because of sackcrete dike wall. Sample point location occurs in tidally influenced areas with a salt tolerant, hydrophytic, vegetation community. The bank was glistening about 12" below the Lyngbye's sedge (Carex lyngbyei) bench during the sit visit and seaweed - Rockweed (Fucus sp.) seaweed was observed just below the sample point location.

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

Project/Site: I-5 McAllister Creek Bridges - Repair Bridge Piles | City/County: n/a / Thurston | Sampling Date: 4/19/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W2-SP2

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: DLC38, T18N, R1E

Landform (hillslope, terrace, etc.): estuarine diked river bench | Local relief (concave, convex, none): concave | Slope (%): 10

Subregion (LRR): A | Lat: 47.069 | Long: -122.72 | Datum: NAD83HARN

Soil Map Unit Name: Puget silt loam | NWI Classification: riverine

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:
Soils are significantly disturbed. Sackcrete dike wall. Soils were not examined due to the sackcrete.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Cytisus scoparius*				UPL
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Agrostis capillaris*	40	**Y**	54.1	FAC
2. *Dactylis glomerata*	10	N	13.5	FACU
3. *Daucus carota*	10	N	13.5	FACU
4. *Hypericum perforatum*	10	N	13.5	FACU
5. *Plantago lanceolata*	2	N	2.7	FACU
6. *Taraxacum officinale*	2	N	2.7	FACU
7.				
8.				
9.				
10.				
11.				
	74 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 25

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	40	x 3 =	120
FACU species	34	x 4 =	136
UPL species	0	x 5 =	0
Column Totals:	74 (A)		256 (B)

Prevalence Index = B/A = 3.459

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:

SOIL

Sampling Point: W2-SP2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:

Soils are significantly disturbed. Sackcrete dike wall. Soils were not examined due to the sackcrete. The vegetation community dominated by non-hydrophytes and the lack of hydrology indicators suggest soils are not hydric even though they could not be observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

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

Project/Site: I-5 McAllister Creek Bridges - Repair Bridge Piles | City/County: n/a / Thurston | Sampling Date: 4/19/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W3-SP1

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: DLC38, T18N, R1E

Landform (hillslope, terrace, etc.): slough overflow channel | Local relief (concave, convex, none): concave | Slope (%): 20

Subregion (LRR): A | Lat: 47.069 | Long: -122.72 | Datum: NAD83HARN

Soil Map Unit Name: Dystric Xerochrepts, 60 to 90 percent slopes | NWI Classification: none

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Salix sitchensis*	5	**Y**	100.0	FACW
2.				
3.				
4.				
5.				
	5 = Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Phalaris arundinacea*	70	**Y**	77.8	FACW
2. *Typha latifolia*	15	N	16.7	OBL
3. *Lotus corniculatus*	5	N	5.6	FAC
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	90 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	75	x 2 =	150
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		180 (B)

Prevalence Index = B/A = 1.895

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:

SOIL

Sampling Point: W3-SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? ◉ Yes ○ No

Remarks:

Soils were inundated to 2 inches. Soil pit not excavated but soils meet the definition of a hydric soil due to long periods of inundation, soil saturation, or a high groundwater table during the growing season.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ◉ Yes ○ No Depth (inches): 2

Water Table Present? ◉ Yes ○ No Depth (inches): 0

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:

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

Project/Site: I-5 McAllister Creek Bridges - Repair Bridge Piles | City/County: n/a / Thurston | Sampling Date: 4/19/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W3-SP2

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: DLC38, T18N, R1E

Landform (hillslope, terrace, etc.): slough overflow channel wall | Local relief (concave, convex, none): concave | Slope (%): 20

Subregion (LRR): A | Lat: 47.069 | Long: -122.72 | Datum: NAD83HARN

Soil Map Unit Name: Dystric Xerochrepts, 60 to 90 percent slopes | NWI Classification: none

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No		
Wetland Hydrology Present?	( ) Yes	(●) No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Rubus armeniacus*	70	**Y**	90.9	FAC
2. *Oemleria cerasiformis*	5	N	6.5	FACU
3. *Sambucus racemosa*	2	N	2.6	FACU
4.				
5.				
	77 = Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Phalaris arundinacea*	10	**Y**	25.0	FACW
2. *Cirsium arvense*	10	**Y**	25.0	FAC
3. *Polystichum munitum*	5	**Y**	12.5	FACU
4. *Cirsium vulgare*	5	**Y**	12.5	FACU
5. *Daucus carota*	5	**Y**	12.5	FACU
6. *Holcus lanatus*	5	**Y**	12.5	FAC
7.				
8.				
9.				
10.				
11.				
	40 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57.1% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	85	x 3 =	255
FACU species	22	x 4 =	88
UPL species	0	x 5 =	0
Column Totals:	117 (A)		363 (B)

Prevalence Index = B/A = 3.103

Hydrophytic Vegetation Indicators:

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

SOIL

Sampling Point: W3-SP2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:

Dike fill material. Could not dig to examine soils. Gravels with sand at surface. Hydrology indicators lacking. Not a hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

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

Project/Site: US 101 Mud Bay Bridges - Repair Bridge Piles | City/County: n/a /Thurston | Sampling Date: 4/6/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W1-SP1

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: S18, T18N, R2W

Landform (hillslope, terrace, etc.): estuarine tidal fringe bench | Local relief (concave, convex, none): concave | Slope (%): 10

Subregion (LRR): A | Lat: 47.045 | Long: -122.991 | Datum: NAD83HARN

Soil Map Unit Name: soils not mapped, on fill | NWI Classification: estuarine intertidal unconsoli

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Juncus gerardi*	95	**Y**	88.8	FACW
2. *Salicornia pacifica*	10	N	9.3	OBL
3. *Distichlis spicata*	2	N	1.9	FACW
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	107 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	97	x 2 =	194
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	107 (A)		204 (B)

Prevalence Index = B/A = 1.907

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [x] 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:

The species listed as Juncus gerardi only had basal leaves. Flowering stalks were not present during the early April site visit. This is just a guess at a genus and species. Despite not having flowering portions to identify this species, it is clear that it is at least a FACW if not OBL salt-tolerant species growing below the high tide line and in the salt-marsh/tidal fringe community. Salicornia species is assumed.

SOIL

Sampling Point: W1-SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 4/2	100					sandy loam	
5-16	2.5Y 6/3	100					gravelly sandy loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? ◉ Yes ○ No

Remarks:

This sample point occurs in the intertidal zone, below the high tide line. Soils do not meet an indicator, however they meet the definition of a hydric soil due to regular tidal inundation and groundwater which ebbs and flows with the tide. The delineation occurred during low tide. Strong salt tolerant, hydrophytic vegetation, wetland hydrology indicators, and landscape position further supports the assertion that this location contains hydric soil. Soils are likely fill for construction of the bridge.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches):

Water Table Present? ○ Yes ◉ No Depth (inches):

Saturation Present? (includes capillary fringe) ◉ Yes ○ No Depth (inches): 0

Wetland Hydrology Present? ◉ Yes ○ No

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

Delineation occurred during low tide. The sample point is within the intertidal zone and below the high tide line.

Remarks:

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

Project/Site: US 101 Mud Bay Bridges - Repair Bridge Piles | City/County: n/a /Thurston | Sampling Date: 4/6/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W1-SP2

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: S18, T18N, R2W

Landform (hillslope, terrace, etc.): estuarine tidal fringe bench | Local relief (concave, convex, none): concave | Slope (%): 5

Subregion (LRR): A | Lat: 47.045 | Long: -122.991 | Datum: NAD83HARN

Soil Map Unit Name: soils not mapped, on fill | NWI Classification: estuarine intertidal unconsoli

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	( ) Yes	(●) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Cytisus scoparius*	10	**Y**	100.0	UPL
2.				
3.				
4.				
5.				
	10 = Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Alopecurus pratensis*	55	**Y**	55.0	FAC
2. *Plantago lanceolata*	45	**Y**	45.0	FACU
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	100 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 100

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	55	x 3 =	165
FACU species	45	x 4 =	180
UPL species	10	x 5 =	50
Column Totals:	110 (A)		395 (B)

Prevalence Index = B/A = 3.591

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:

SOIL

Sampling Point: W1-SP2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					Sandy Loam	
3-14	10YR 4/3	100					Sand	with pebbles

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:

Soils are likely fill for construction of the bridge.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

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

Project/Site: US 101 Mud Bay Bridges - Repair Bridge Piles | City/County: n/a /Thurston | Sampling Date: 4/6/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W2-SP1

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: S18, T18N, R2W

Landform (hillslope, terrace, etc.): estuarine tidal fringe bench | Local relief (concave, convex, none): concave | Slope (%): 10

Subregion (LRR): A | Lat: 47.045 | Long: -122.99 | Datum: NAD83HARN

Soil Map Unit Name: soils not mapped, on fill | NWI Classification: none

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	(●) Yes	( ) No	**Is the Sampled Area within a Wetland?**	(●) Yes ( ) No
Hydric Soil Present?	(●) Yes	( ) No		
Wetland Hydrology Present?	(●) Yes	( ) No		

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1.				
2.				
3.				
4.				
5.				
	= Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Salicornia pacifica*	60	Y	66.7	OBL
2. *Juncus gerardi*	20	Y	22.2	FACW
3. *Grindelia integrifolia*	10	N	11.1	FACW
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	90 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	90 (A)		120 (B)

Prevalence Index = B/A = 1.333

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [x] 2 - Dominance Test is >50%
- [x] 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:

The species listed as Juncus gerardi only had basal leaves. Flowering stalks were not present during the early April site visit. This is just a guess at a genus and species. Despite not having flowering portions to identify this species, it is clear that it is at least a FACW if not OBL, salt-tolerant species growing below the high tide line and in the salt-marsh/tidal fringe community. Salicornia species is assumed.

SOIL

Sampling Point: W2-SP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5Y 4/3	100					Sandy Loam	
4-16	2.5Y 4/3	100					Sandy Loam	with gravels

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ◉ Yes ○ No

Remarks:

This sample point occurs in the intertidal zone, below the high tide line. Soils do not meet an indicator, however they meet the definition of a hydric soil due to regular tidal inundation and groundwater which ebbs and flows with the tide. The delineation occurred during low tide. Strong salt tolerant, hydrophytic vegetation, wetland hydrology indicators, and landscape position further supports the assertion that this location contains hydric soil. Soils are likely fill for construction of the bridge.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ◉ Yes ○ No

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

Remarks:

Delineation occurred during low tide. The sample point is within the intertidal zone and below the high tide line.

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

Project/Site: US 101 Mud Bay Bridges - Repair Bridge Piles | City/County: n/a /Thurston | Sampling Date: 4/6/2021

Applicant/Owner: Washington State Department of Transportation | State: WA | Sampling Point: W2-SP2

Investigator(s): Tatiana Dreisbach, Tom Mohagen | Section, Township, Range: S18, T18N, R2W

Landform (hillslope, terrace, etc.): estuarine tidal fringe bench | Local relief (concave, convex, none): concave | Slope (%): 10

Subregion (LRR): A | Lat: 47.045 | Long: -122.99 | Datum: NAD83HARN

Soil Map Unit Name: soils not mapped, on fill | NWI Classification: none

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

Are Vegetation [ ], Soil [ ], or Hydrology [ ] significantly disturbed? Are "Normal Circumstances" present? (●) Yes ( ) No

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

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

Hydrophytic Vegetation Present?	( ) Yes	(●) No	**Is the Sampled Area within a Wetland?** ( ) Yes (●) No
Hydric Soil Present?	( ) Yes	(●) No	
Wetland Hydrology Present?	( ) Yes	(●) No	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 20ft x 20ft)	Absolute % Cover	Dom. Sp.?	Relative % Cover	Indicator Status
1.				
2.				
3.				
4.				
	= Total Cover			
Sapling/Shrub Stratum (Plot size: 15ft x 15ft)				
1. *Cytisus scoparius*	12	**Y**	100.0	UPL
2.				
3.				
4.				
5.				
	12 = Total Cover			
Herb Stratum (Plot size: 5ft x 5ft)				
1. *Rumex acetosella*	25	**Y**	78.1	FACU
2. *Alopecurus pratensis*	5	N	15.6	FAC
3. *sm. white flowered mustard*	2	N	6.3	#N/A
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
	32 = Total Cover			
Woody Vine Stratum (Plot size: 5ft x 5ft)				
1.				
2.				
	= Total Cover			

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	25	x 4 =	100
UPL species	12	x 5 =	60
Column Totals:	42 (A)		175 (B)

Prevalence Index = B/A = 4.167

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:

Other than the herbaceous plants and 5% cover of bare ground in the herb layer, a dense moss community is established.

SOIL

Sampling Point: W2-SP2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 3/3	100					Sandy Loam	
3-14	10YR 4/3	100					Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? ○ Yes ◉ No

Remarks:

Soils are likely fill for construction of the bridge.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? ○ Yes ◉ No Depth (inches): _____

Water Table Present? ○ Yes ◉ No Depth (inches): _____

Saturation Present? (includes capillary fringe) ○ Yes ◉ No Depth (inches): _____

Wetland Hydrology Present? ○ Yes ◉ No

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

Remarks:

Appendix C. Wetland Rating Summaries and Figures

Appendix C includes wetland rating forms and all required figures for each wetland.

Wetland name or number W1, W2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): I-5 McAllister Creek - Repair Bridge Piles, W 1 & 2 Date of site visit: 4/19/2021

Rated by Tatiana Dreisbach Trained by Ecology? ☑ Yes ☐ No Date of training 6/12/2014

HGM Class used for rating estuarine Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).

Source of base aerial photo/map Statewide 2019 1ft 4 band WSPS 83HARN (workben

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

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential				
Landscape Potential				
Value				**Total**
Score Based on Ratings				**0**

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	II
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Wetland name or number W1, W2

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number W1, W2

HGM Classification of Wetland in Western Washington

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:
The wetland unit occurs just south of the Billy Frank Jr. Nisqually National Wildlife Refuge where mud flat grades into the channel feature of McAllister Creek. The wetland unit was broken at this geomorphic feature in combination with a vegetation change from mud flat to Lyngbye's sedge (Carex lyngbyei) along the tidally influenced, riverine bench wetlands. The wetland is > 1 acre but does not meet any of the criteria for SC 1.2 and therefore is Category II.

Wetland name or number W1, W2

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

SC 4.0. Forested Wetlands

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

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

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

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

SC 5.0. Wetlands in Coastal Lagoons

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

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

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

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

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

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

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

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

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

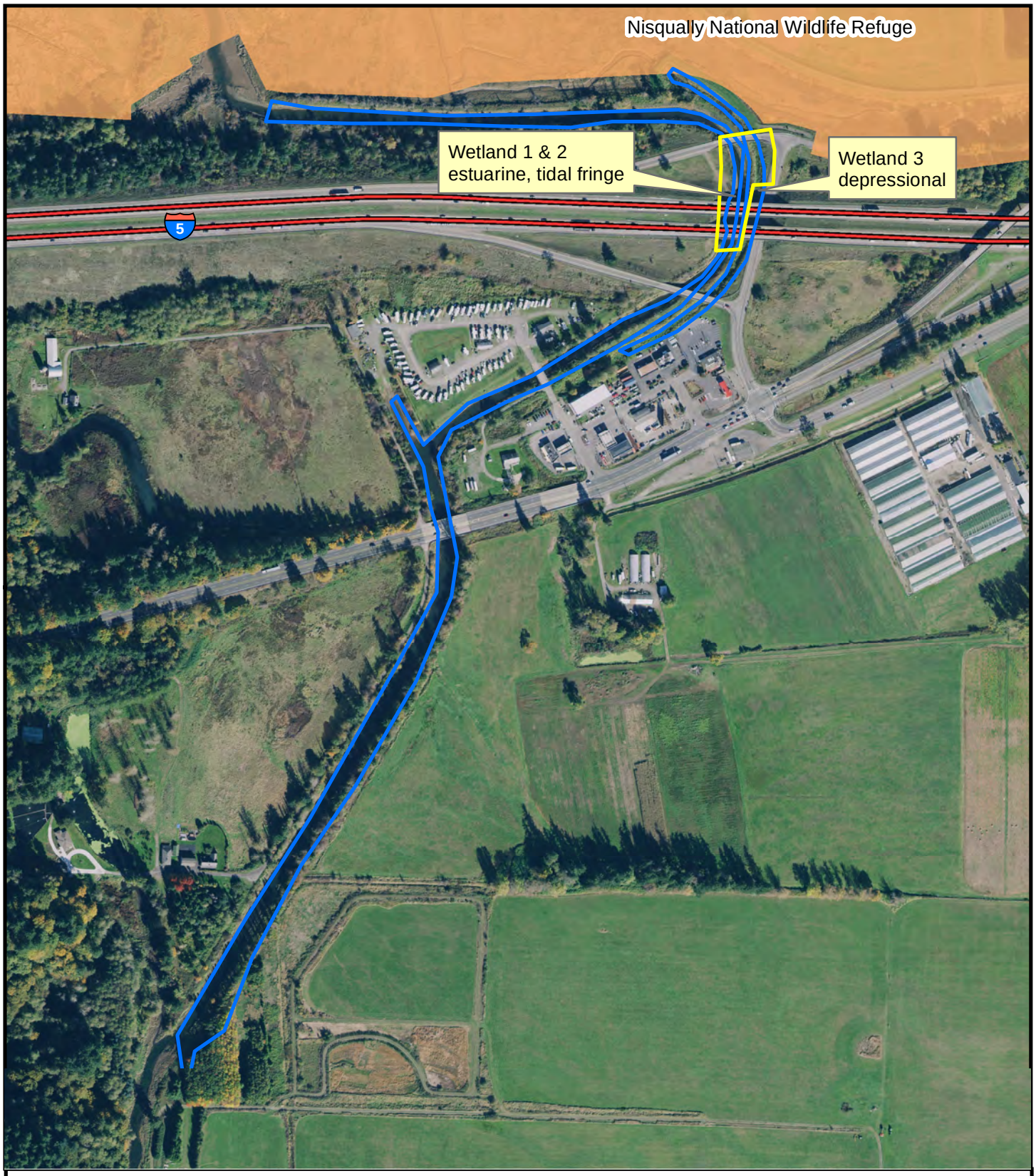
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

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

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

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

Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**Cat. II**



Wetland Rating System for Western Washington 2014 Update

Wetland unit used for rating
Wetland 1 & 2

N

0 200 400
Feet

Wildlife Refuge (Fed/State)

Study Area

Estimated wetland unit used for rating

Washington State Department of Transportation

May 3, 2021

GISWorkbench.mxd/ Date Printed

Wetland name or number W3

RATING SUMMARY – Western Washington

Name of wetland (or ID #): I-5 McAllister Creek - Repair Bridge Piles, W3 Date of site visit: 4/19/2021

Rated by Tatiana Dreisbach Trained by Ecology? ☑ Yes ☐ No Date of training 6/12/2014

HGM Class used for rating Depressional & Flats Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).
Source of base aerial photo/map Statewide 2019 1 ft 4 band wsps 83h from Workbenc

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

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		List appropriate rating (H, M, L)		
Site Potential	M	H	L	
Landscape Potential	H	H	M	
Value	H	H	M	**Total**
Score Based on Ratings	8	9	5	**22**

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number W3

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	1
Hydroperiods	D 1.4, H 1.2	1
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	1
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	2
Map of the contributing basin	D 4.3, D 5.3	3
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	4
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	5
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	5

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number W3

HGM Classification of Wetland in Western Washington

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:
This wetland is a described as a slough overflow channel. It has a tide gate as an outlet. The site evaluation occurred during low tide and the tide gate was closed and did not appear to be functioning. This closed tide gate results in the wetland functioning as a closed depression within the constructed berm surrounding the wetland feature. The feature may have been a remnant feature of previous land and tidal management in the area and at the Billy Frank Jr. Nisqually National Wildlife Refuge. The wetland appears to have primary hydrologic inputs from a high groundwater table in the Nisqually River delta and at the mouth of the estuary at Nisqually. The vegetation community is palustrine not estuarine, further indicating the tide gate is not currently functioning. D6.1. The tide gate appears to be non-functioning and essentially acts as a closed depression with no surface water leaving (or entering) through the outlet. D6.2 Though the tide gate does not seem to be functioning, the wetland was apparently constructed as an overflow channel. Whether or not it is currently functioning to provide flood storage was not apparent, but the points are being assigned for this question because that was its apparent original purpose. D 2.3 Confirmed that the mobile home park, parcel number: 65110001100, is on septic and it is less than 100 feet from the wetland.

Wetland name or number W3

DEPRESSIONAL AND FLATS WETLANDS

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

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

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

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	1
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1 - D 2.3? Source	Yes = 1 No = 0	0
Total for D 2	Add the points in the boxes above	**3**

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

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

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

Wetland name or number W3

DEPRESSIONAL AND FLATS WETLANDS

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

D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.* Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 ☑ Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 ☐ The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0	3
D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.* ☑ The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 ☐ Entire wetland is in the Flats class points = 5	5
Total for D 4 — Add the points in the boxes above	**12**

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

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

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

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): ● Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2 ☐ ● Surface flooding problems are in a sub-basin farther down-gradient. points = 1 ☐ Flooding from groundwater is an issue in the sub-basin. points = 1 ☑ The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why points = 0 ☐ There are no problems with flooding downstream of the wetland. points = 0	0
D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	2
Total for D 6 — Add the points in the boxes above	**2**

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

Wetland name or number W3

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

H 1.0. Does the site have the potential to provide habitat?

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

☐ Aquatic bed	4 structures or more: points = 4	0
☑ Emergent	3 structures: points = 2	
☐ Scrub-shrub (areas where shrubs have > 30% cover)	2 structures: points - 1	
☐ Forested (areas where trees have > 30% cover)	1 structure: points = 0	

If the unit has a Forested class, check if:

☐ The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon

H 1.2. Hydroperiods

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

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

H 1.3. Richness of plant species

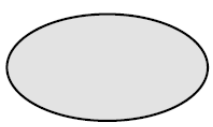
Count the number of plant species in the wetland that cover at least 10 ft^2.
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

1

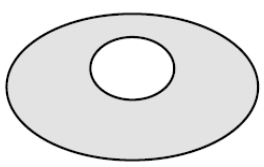
If you counted:	> 19 species	points = 2
	5 - 19 species	points = 1
	< 5 species	points = 0

H 1.4. Interspersion of habitats

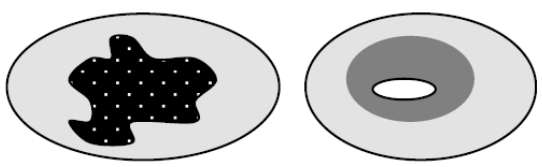
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



None = 0 points



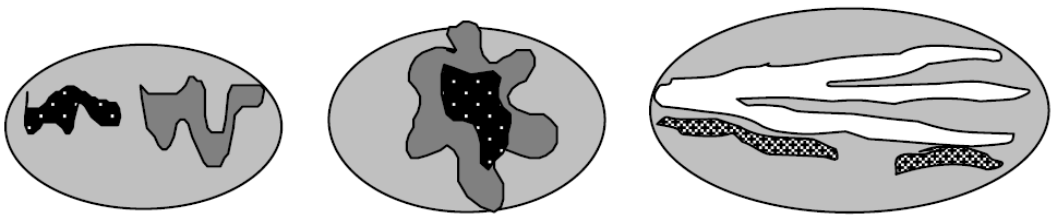
Low = 1 point



Moderate = 2 points

0

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



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

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

H 2.0. Does the landscape have the potential to support the habitat function of the site?	
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* 0 % undisturbed habitat + (0 % moderate & low intensity land uses / 2) = 0% If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20 - 33% of 1 km Polygon points = 2 10 - 19% of 1 km Polygon points = 1 < 10 % of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* 54 % undisturbed habitat + (0 % moderate & low intensity land uses / 2) = 54% Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches points = 2 Undisturbed habitat 10 - 50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	3
H 2.3 Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (-2) ≤ 50% of 1km Polygon is high intensity points = 0	0
Total for H 2 Add the points in the boxes above	**3**

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

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

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

WDFW Priority Habitats

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

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

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

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

Wetland name or number W3

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

SC 4.0. Forested Wetlands

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

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

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

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

SC 5.0. Wetlands in Coastal Lagoons

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

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

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

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

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

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

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

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

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

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

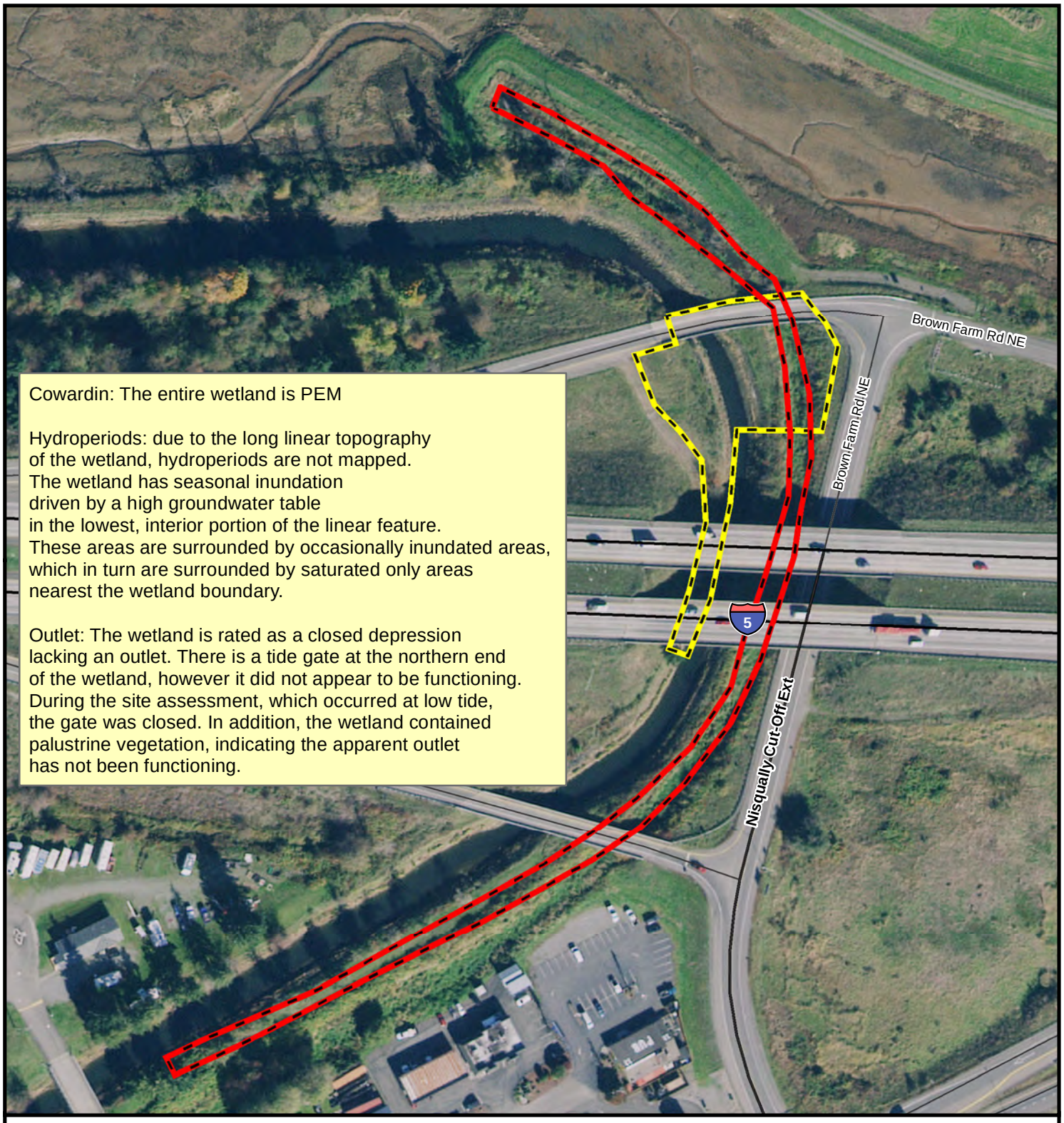
☐ Yes = **Category II** ☐ No - Go to **SC 6.3**

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

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

Category of wetland based on Special Characteristics

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



Cowardin: The entire wetland is PEM

Hydroperiods: due to the long linear topography of the wetland, hydroperiods are not mapped. The wetland has seasonal inundation driven by a high groundwater table in the lowest, interior portion of the linear feature. These areas are surrounded by occasionally inundated areas, which in turn are surrounded by saturated only areas nearest the wetland boundary.

Outlet: The wetland is rated as a closed depression lacking an outlet. There is a tide gate at the northern end of the wetland, however it did not appear to be functioning. During the site assessment, which occurred at low tide, the gate was closed. In addition, the wetland contained palustrine vegetation, indicating the apparent outlet has not been functioning.

N

0 75 150 300
Feet

Wetland Rating for Western Washington 2014 Update

I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
Wetland 3

Cowardin Plant Classes Map
Questions D 1.3, H 1.1, H 1.4

Washington State Department of Transportation

wetland
study area

Fig1_D_Cowardin

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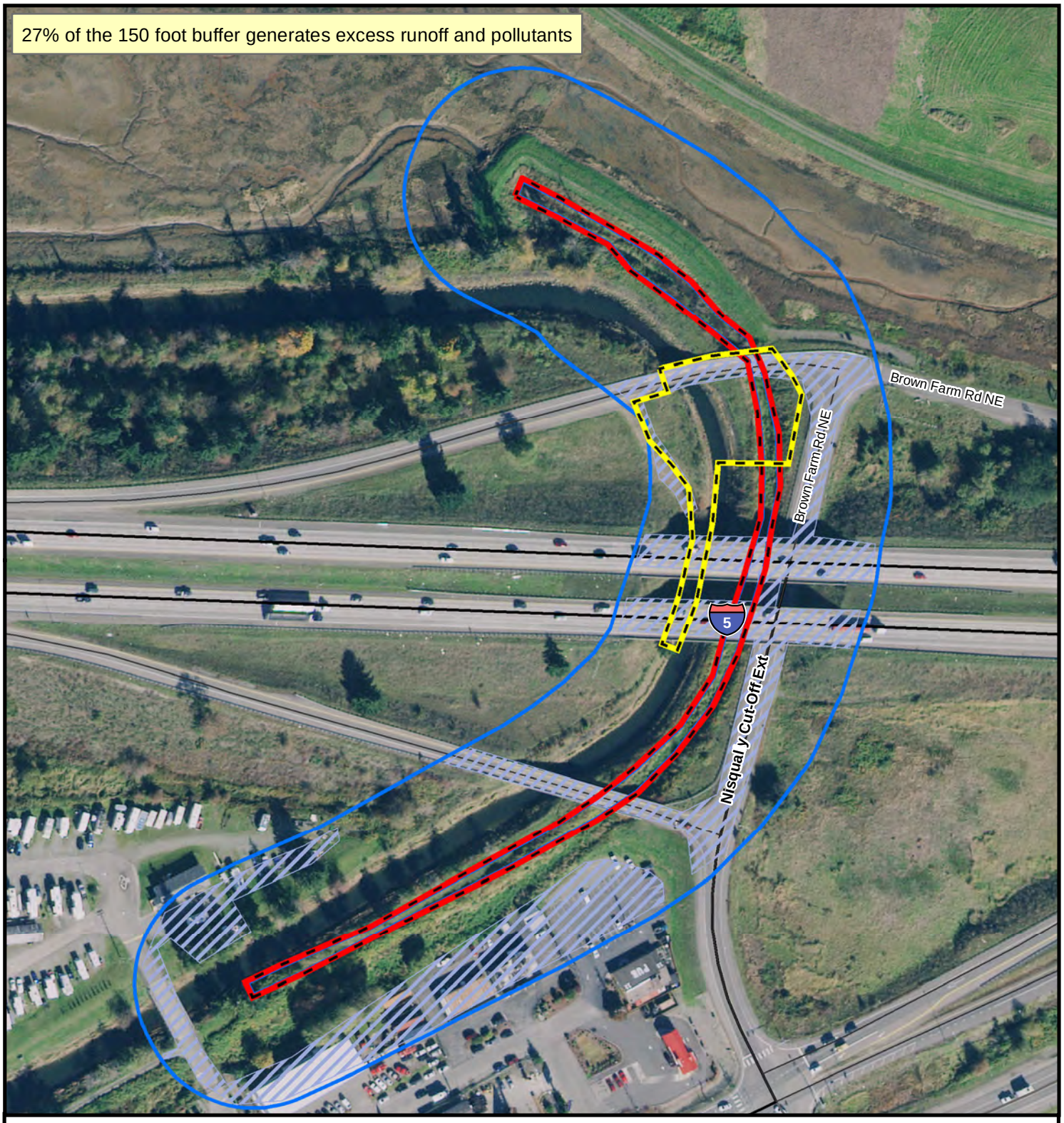
Figure 1



Wetland Rating for Western Washington 2014 Update

I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
Wetland 3

150 ft Polygon Map
Questions D 2.2, D 5.2

N

0 75 150 300
Feet

- study area
- wetland
- pollutant and excess runoff generating surfaces
- 150 foot buffer

Washington State Department of Transportation

Fig2_D_150ftPolygon

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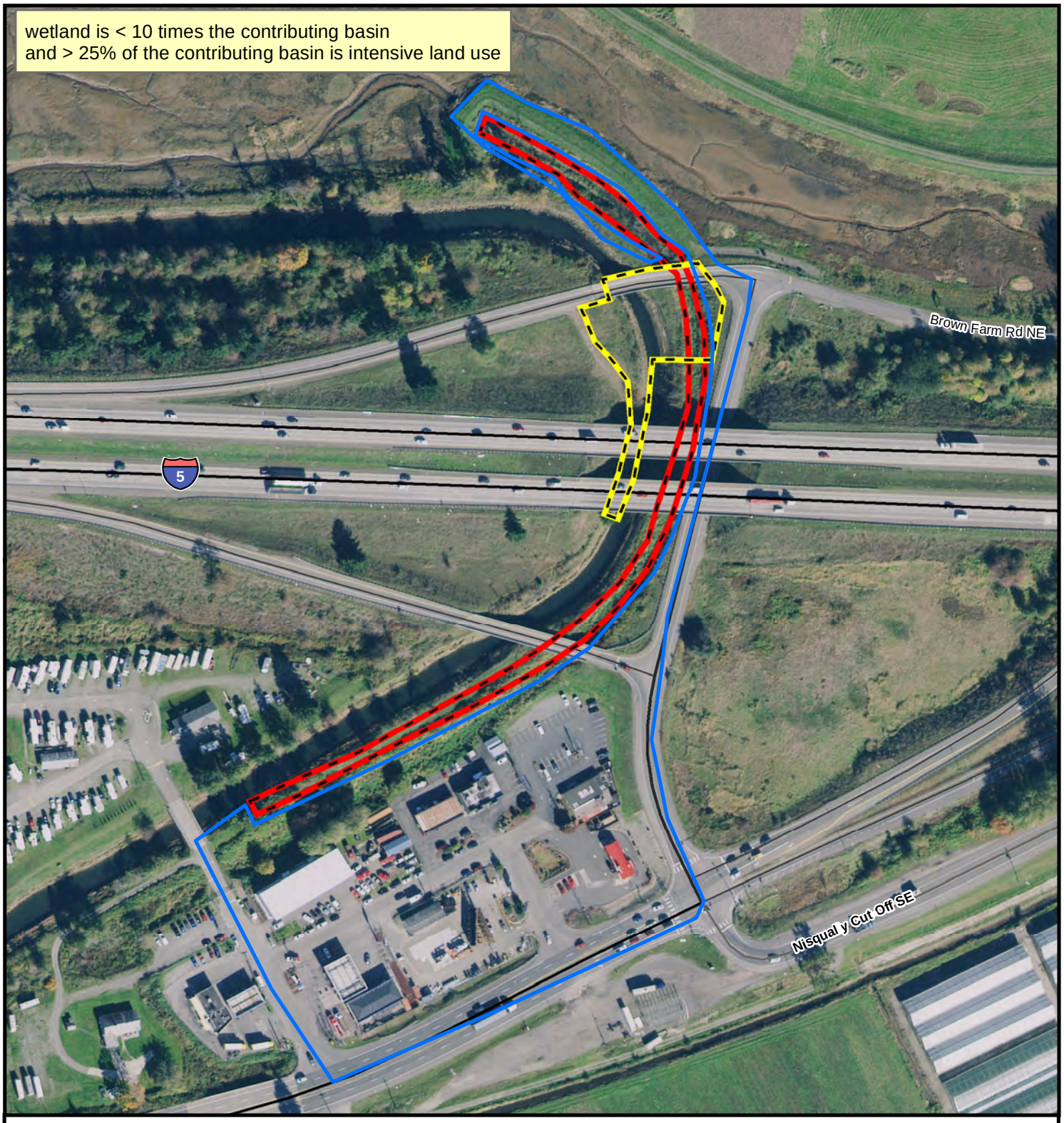
Figure 2



Wetland Rating for Western Washington 2014 Update

I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
Wetland 3

Contributing Basin Map
Questions D 4.3, D 5.3

N

0 100 200 400
Feet

contributing basin
study area
wetland

Washington State Department of Transportation

Fig3_D_ContributingBasin

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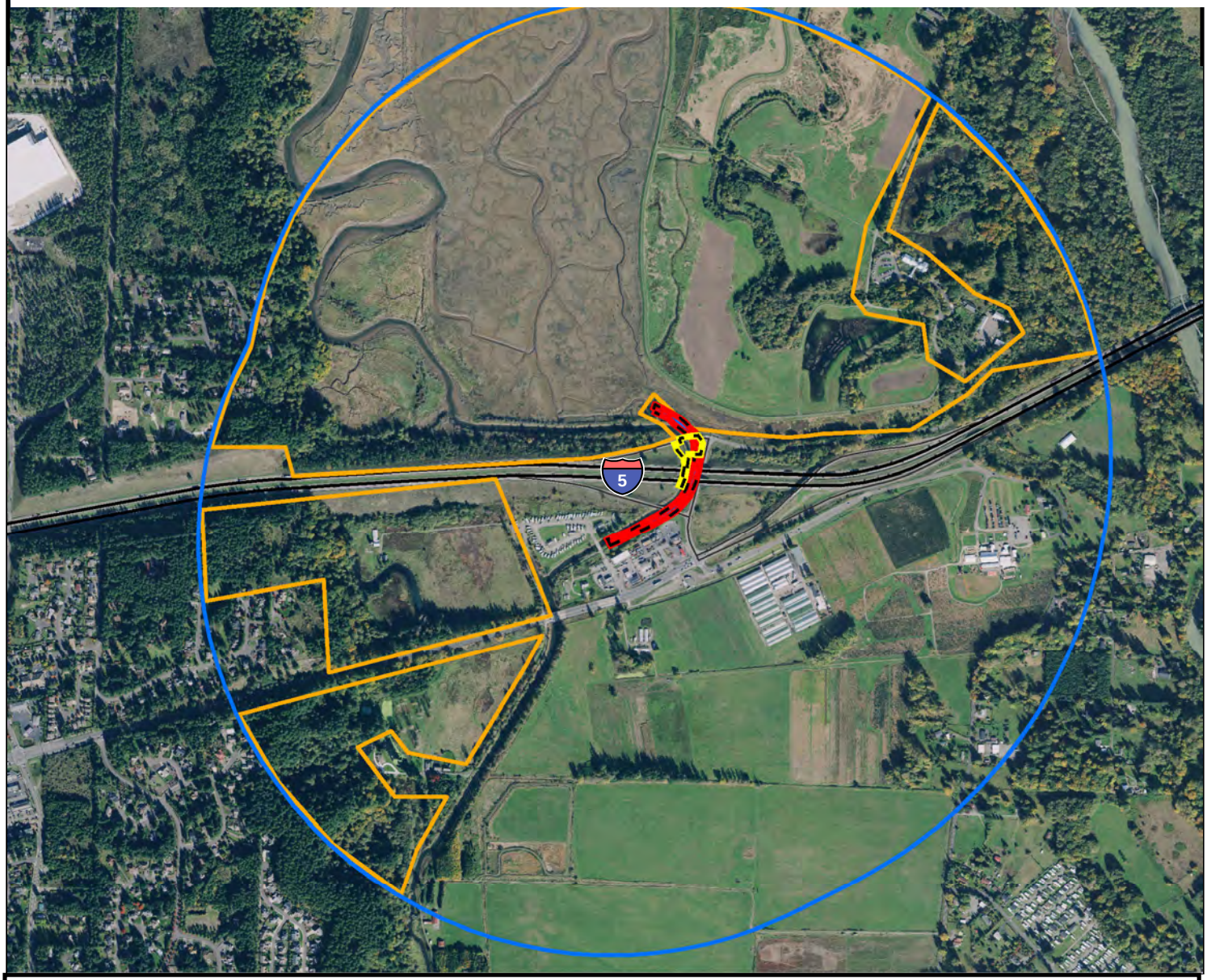
Figure 3

H 2.2 54 % undisturbed habitat + (0 % moderate & low intensity land use /2) = 54 %



N

0 0.25 0.5 1
Kilometers

Washington State Department of Transportation

Fig4_D_1KmPolygon

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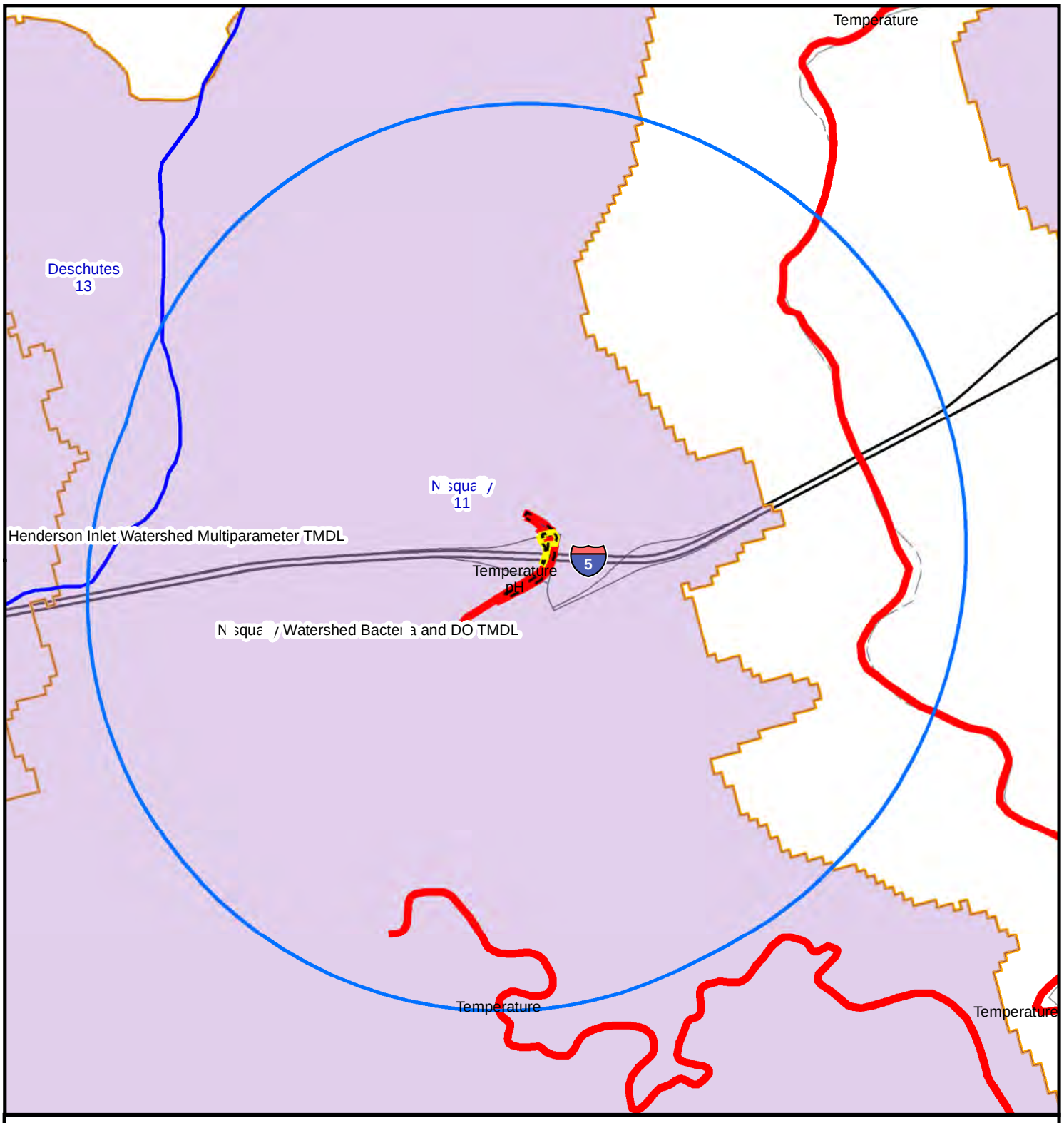
Wetland Rating for Western Washington 2014 Update

I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles
Wetland 3

1 km Polygon Map
Questions H 2.1, H 2.2, H 2.3

- 1 km buffer
- study area
- wetland
- separated undisturbed

Figure 4



Wetland Rating for Western Washington 2014 Update

I-5/US 101 McAllister Creek & Mud Bay Bridges - Repair Bridge Piles

Wetland 3

303(d) listed waters in basin & TMDL's for WRIA Map Questions D 3.1, D 3.2, D 3.3

N

0 0.25 0.5 1

Miles

- 1 mile buffer
- study area
- wetland
- WRIA (1:24K)
- Category 5 Impaired Waters
- Approved TMDLs
- TMDLs in Development

Washington State Department of Transportation

Fig5_D_303(d)&TMDLs

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Figure 5

Wetland name or number W1, W2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): US 101 Mud Bay Bridges - Repair Bridge Piles, W 1 & 2 Date of site visit: 4/6/2021

Rated by Tatiana Dreisbach Trained by Ecology? ☑ Yes ☐ No Date of training 6/12/2014

HGM Class used for rating estuarine Wetland has multiple HGM classes? ☐ Yes ☑ No

NOTE: Form is not complete with out the figures requested (*figures can be combined*).

Source of base aerial photo/map Statewide 2019 1ft 4 band WSPS 83HARN (workben

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

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
			List appropriate rating (H, M, L)	
Site Potential				
Landscape Potential				
Value				**Total**
Score Based on Ratings				**0**

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	II
Wetland of High Conservation Value	
Bog	
Mature Forest	
Old Growth Forest	
Coastal Lagoon	
Interdunal	
None of the above	

Wetland name or number W1, W2

Maps and Figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number W1, W2

HGM Classification of Wetland in Western Washington

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:
Wetland 1 and 2 are rated using the same form and figure as they are two similar estuarine, tidal fringe wetlands, separated by an unvegetated channel > 50 feet wide. SC 1.2 Both Wetland 1 and 2 have fill in the areas under the US 101 bridges. So they are considered disturbed. The buffer does not meet the requirements. Each of these wetlands are > 1 acre, however, they only meet the Category II criteria.

Wetland name or number W1, W2

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

SC 4.0. Forested Wetlands

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

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

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

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

SC 5.0. Wetlands in Coastal Lagoons

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

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

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

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

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

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

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

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

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

SC 6.0. Interdunal Wetlands

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

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

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

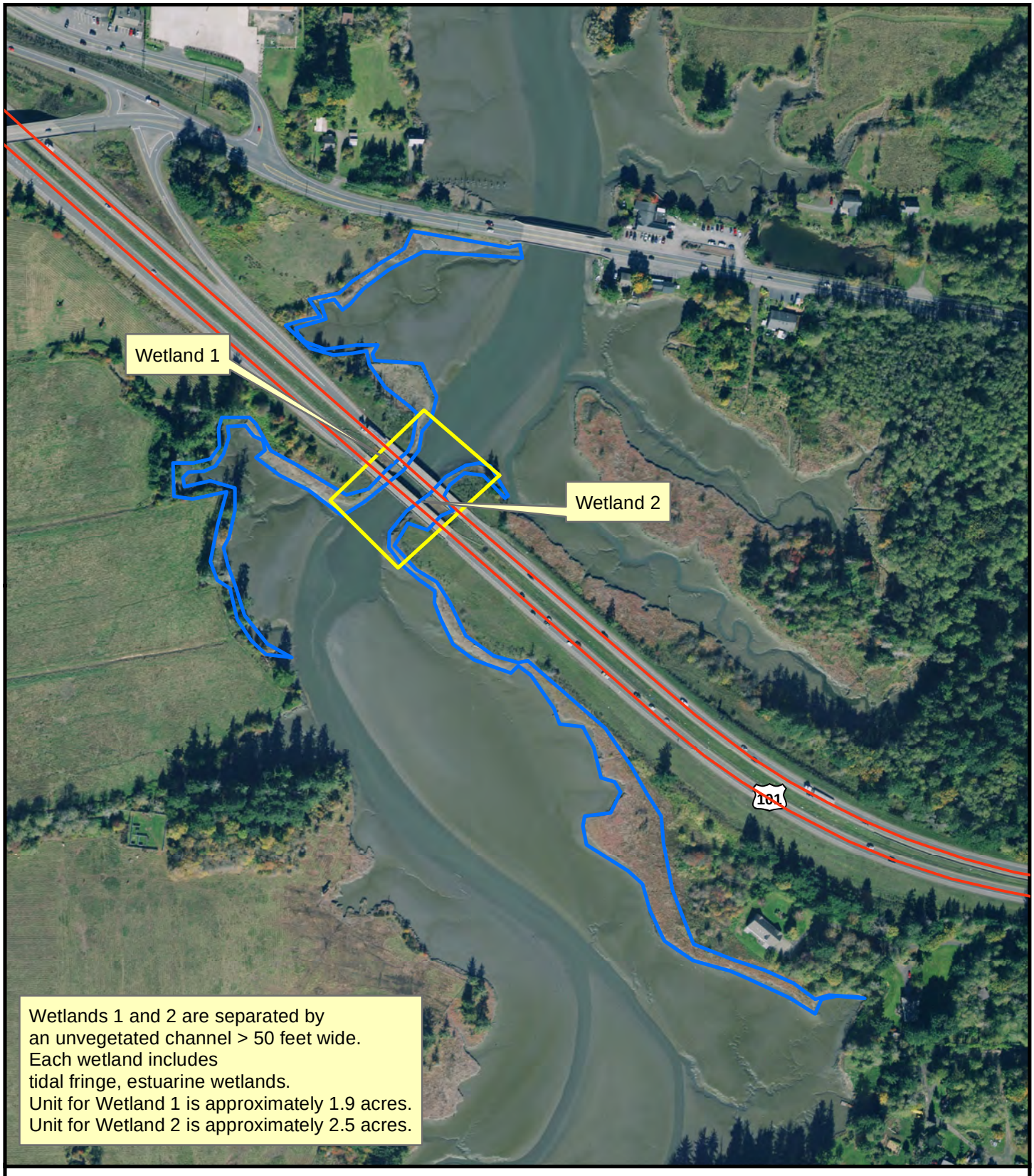
SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?

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

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

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

Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	**Cat. II**



Wetlands 1 and 2 are separated by
an unvegetated channel > 50 feet wide.
Each wetland includes
tidal fringe, estuarine wetlands.
Unit for Wetland 1 is approximately 1.9 acres.
Unit for Wetland 2 is approximately 2.5 acres.

Wetland Rating System for Western Washington 2014 Update

Wetland unit used for rating

N

0 200 400
Feet

Study Area

Eastimated wetland unit for rating

Washington State
Department of Transportation

May 3, 2021

GISWorkbench.mxd/ Date Printed

Appendix D. Wetland Functional Assessment Summaries

Summary of Functions and Values

Project: I-5/US 101 McAllister Creek & Mud Bay Bridges **Wetland ID:** McAllister Wetlands 1 & 2

Cowardin Class: EEM **HGM:** Tidal Fringe **Ecology Rating:** II **Thurston County Rating:** II

Assessed by: Tatiana Dreisbach **Date:** April 19, 2021

Function/Value	Occurrence Y	Occurrence N	Rationale (qualifiers & attributes)	Principal Function	Comments
Flood flow alteration		n/a			Tidal fringe wetlands do not provide this function.
Sediment removal		X			Wetland established on dike wall armored in some areas with rip-rap/quarry spalls and sackcrete in others. EEM vegetation is established but its density and aerial cover are not significant enough to provide this function within project limits. Water is always moving out with the creek or in with the tide.
Nutrient and toxic removal		X			The banks of the dike are hardened and armored, eliminating the ability of soil to perform this function.
Erosion control & shoreline stabilization		X	banks armored		Armored banks provide this function regardless of wetland presence.
Production of organic matter and its export	X		1, 4, 5, 6	X	Has EEM vegetation in inundated areas, with outlet to tidally influenced waters. EEM areas receive daily or occasional tidal water exchanges.
General habitat suitability		X	3, 7		Wetland is connected to other habitats through instream habitat, though it is fragmented by development and lacks functional riparian buffers. Mammal tracks were observed.
Habitat for aquatic invertebrates		X	1, 2, 4, 6		Though many of the physical attributes are present to provide this function, the hardened dike walls make this function not likely to be provided. Soil is lacking.
Habitat for amphibians		X	1, 2, 6		Though several physical attributes are present to provide this function, it is a tidally influenced habitat with saltwater present, however it is a tidally influenced habitat with saltwater present, which does not support amphibians.
Habitat for wetland-associated mammals	X		1, 2, 5, 7	X	Wetland associated mammal may use the wetland for connection to other habitats and fish are present, so hunting opportunities are present. Denning opportunity is not provided due to armored banks. Tracks of mammals observed, but species and wetland refinance unknown.
Habitat for wetland-associated birds	X		1, 2		The wetland may provide some habitat elements, however lack of buffers, woody vegetation, snags, sand bars, proximity to I-5 etc. limit this function.
General fish habitat	X		1, 2, 4	X	WDFW documents use by several species including salmonids.
Native plant richness		X	1		Dominated by native EEM species, but diversity is low and structure limited to one Cowardin class.
Educational or scientific use		X			Not a safe location to bring the public due to proximity near roads.
Uniqueness & heritage	X		1, 2, 6	X	Federally listed threatened DPS Puget Sound steelhead documented in Creek. ESU Puget Sound chinook designated critical habitat present. Tidally influenced estuarine wetland connects to Nisqually Wildlife Refuge.

Summary of Functions and Values

Project: I-5 McAllister Creek Bridges **Wetland ID:** McAllister Creek Wetland 3

Cowardin Class: PEM **HGM:** Depressional **Ecology Rating:** II **Thurston County Rating:** II

Assessed by: Tatiana Dreisbach **Date:** April 19, 2021

Function/Value	Occurrence Y	Occurrence N	Rationale (qualifiers & attributes)	Principal Function	Comments
Flood flow alteration	X		2, 3	X	This wetland has an apparent non-functioning tide gate, currently acting as a closed depression. There is not a lot of opportunity for inputs based on wetland position at base of constructed channel walls but may receive inputs from surrounding development.
Sediment removal		X	3, 4, 5		Inputs apparently lacking, though dense PEM vegetation could trap sediment.
Nutrient and toxic removal	X		1, 2, 3, 4	X	Agriculture present upgradient. Dense PEM vegetation and long duration water detention help provide this function.
Erosion control & shoreline stabilization		n/a			Not associated with a shoreline.
Production of organic matter and its export	X		1, 4, 5		Produces organic matter but tide gate appears non-functioning so wetland currently appears to function as a closed depression without an outlet
General habitat suitability		X	3		Wetland is a man-made feature between dike walls and with a tide gate, surrounded by development and I-5.
Habitat for aquatic invertebrates	X		1, 2, 4, 6	X	Varying water depths throughout the year with PEM vegetation adjacent to McAllister Creek make this a potential provided function.
Habitat for amphibians	X		1, 5, 6		May provided adult habitat but breeding and rearing not likely because plant community is primarily reed canarygrass, broadleaf cattail (thin-stemmed lacking).
Habitat for wetland-associated mammals		X			Permanent water lacking so function not provided.
Habitat for wetland-associated birds		X	2, 6, 8		Lacks habitat characteristics like POW, sand bars/mud flats, functional buffers.
General fish habitat		X			Not associated with fish bearing water (tide gate to estuary closed) so function not provided.
Native plant richness		X			High cover of reed canarygrass.
Educational or scientific use		X			
Uniqueness & heritage		X			

Summary of Functions and Values

Project: I-5/US 101 McAllister Creek & Mud Bay Bridges **Wetland ID:** Mud Bay Wetlands 1 & 2

Cowardin Class: EEM **HGM:** Tidal Fringe **Ecology Rating:** II **Thurston County Rating:** II

Assessed by: Tatiana Dreisbach **Date:** April 6, 2021

Function/Value	Occurrence Y	Occurrence N	Rationale (qualifiers & attributes)	Principal Function	Comments
Flood flow alteration		n/a			Tidal fringe wetlands do not provide this function.
Sediment removal		X	3, 4		The a tidal fringe wetland with dense EEM vegetation Water is always moving with the incoming and outgoing tides. A significant source of inputs was not identified.
Nutrient and toxic removal		X	1, 2, 4, 5		Inputs many be present from pasture lands to the south, dense EEM veg and some fine textured soils may provide this unction but tidal action may reduce the ability of this wetland to perform this function.
Erosion control & shoreline stabilization	X		1, 2	X	The dense EEM community contributes to shoreline stabilization from daily tidal action, but large erosive storm events/tides likely occasionally overpower the rooted vegetation and result in erosion.
Production of organic matter and its export	X		1, 4, 5, 6	X	Has EEM vegetation in inundated areas, with outlet to tidally influenced waters. EEM areas receive daily or occasional tidal water exchanges.
General habitat suitability		X	3	X	Wetland is connected to other habitats through tidal waters of Mud Bay and Eld Inlet. The mouth of McLane Creek and its surprising forests area are also connected. Provides habitat for species living and using the intertidal zone.
Habitat for aquatic invertebrates	X		1, 2, 4, 6	X*	Physical attributes are present to provide this function, for salt tolerant aquatic invertebrates. Some observed in the field.
Habitat for amphibians		X	1, 2, 5, 6		Thug several physical attributes are present to provide this function, however it is a tidally influenced habitat with saltwater present, which does not support amphibians.
Habitat for wetland-associated mammals	X		1, 2, 5	X	Wetland associated mammal may use the wetland for connection to other habitats and fish are present, so hunting opportunities are present.
Habitat for wetland-associated birds	X		1, 2, 5, 6	X	Mud flats and EEM areas in intertidal zone of Mud Bay provide this function.
General fish habitat	X		1, 2, 4	X	Fish including salmonids are present in Mud Bay and have access to the wetlands in the study area at high tide.
Native plant richness		X	1		Dominated by native EEM species, but structure is limited to one Cowardin class.
Educational or scientific use		X			Not a safe location to bring the public due to proximity near roads.
Uniqueness & heritage	X		1, 2, 6	X	ESU Puget Sound chinook nearshore designated critical habitat present. Tidally influenced estuarine wetland connects to Mud Bay.

Appendix E. HPT Data

Appendix E provides the data showing mean elevation of HPT over a 10-year period.

I-5 McAllister Creek Bridges and US 101 Mud Bay Bridges

Mean elevation of HPT over a 10-year period from January 1, 2021 to December 31, 2030[a]

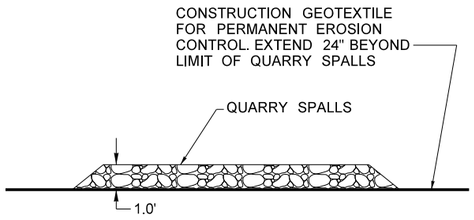
Date of HPT for 10 years (2021 to 2030)	HPT elevation (feet)[b]
6-Dec-21	16.088
4-Jan-22	16.254
24-Jan-23	16.267
15-Jan-24	16.195
7-Dec-25	16.058
5-Jan-26	16.151
25-Jan-27	16.339
16-Jan-28	16.49
3-Feb-29	16.322
27-Dec-30	16.332
mean elevation of HPT over a 10-year period from January 1, 2021 to December 31, 2030	**16.2496**

[a] NOAA 2021

[b] HTL elevation relative to MLLW of 0 at Budd Inlet, South of Gull Harbor, WA Station 9446807

Appendix F. Plan Sheets

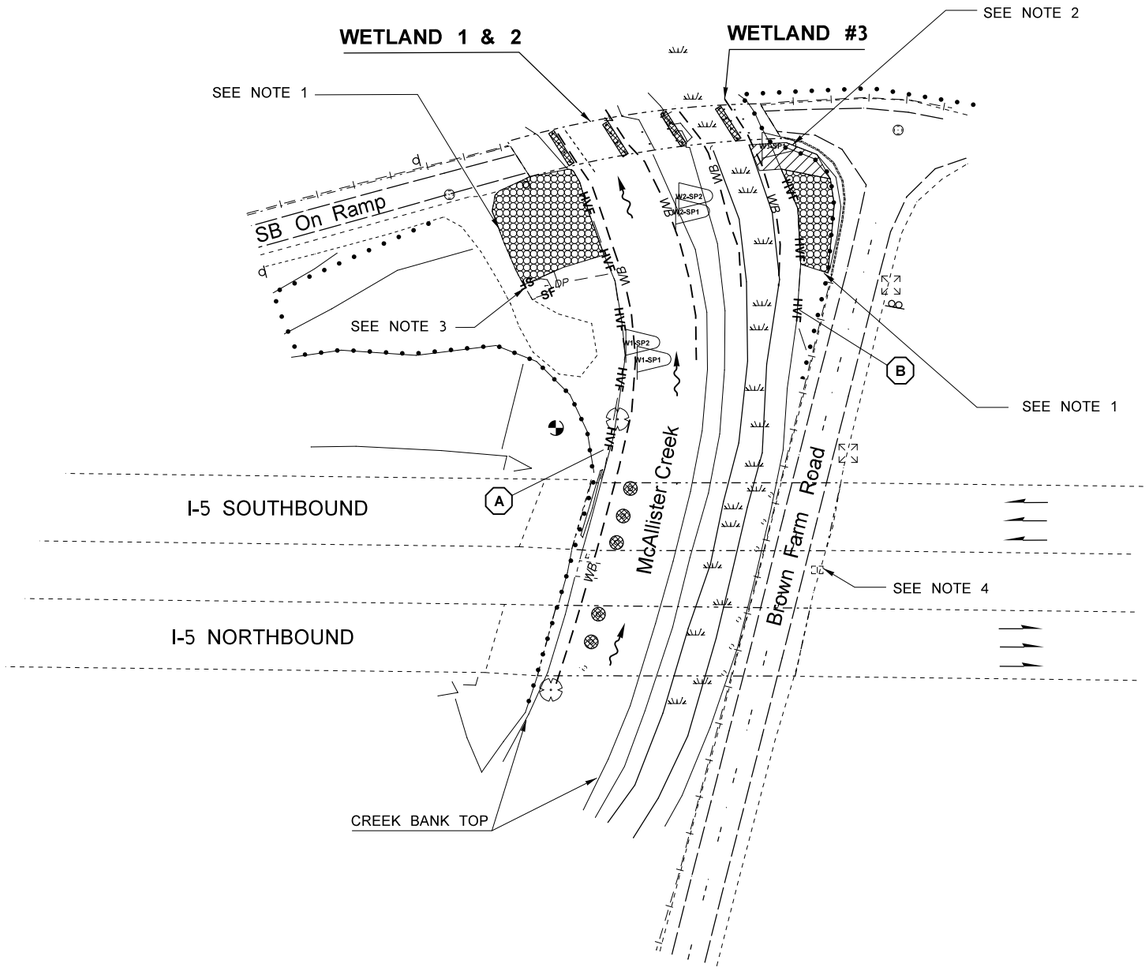
Appendix F includes plan sheet showing existing conditions including wetland, stream, and HTL boundaries, wetland sample point locations, and regulatory buffers.



TEMPORARY CONSTRUCTION ACCESS

NOT TO SCALE

T.18N., R1E., 6 & 7 W.M.



LEGEND

QUANTITY NOTE	??
CABLE BARRIER	
EXISTING GUARDRAIL	
WETLAND BUFFER	
WETLAND BOUNDARY	WB
PROPOSED COLUMN EXCAVATION AREAS	
HIGH VISIBILITY FENCING	HVF
TEMPORARY CONSTRUCTION ACCESS	
SILT FENCE	SF
EXISTING SIGN	
GRATE INLET TYPE 2	
TREE	
BORE HOLE	
TYPE 1 JUNCTION BOX EXISTING	
SURVEY MONUMENT	
BRIDGE COLUMN NOT INCLUDED	
CONCRETE BARRIER	
WETLANDS	
EXISTING STRUCTURE	

NOTES

1 - TEMPORARY CONSTRUCTION ACCESS - SEE DETAIL THIS SHEET
2 - CLEARING AREA
3 - SILT FENCE FOR INLET PROTECTION (APPROX. 60 LF) - SEE STD. PLAN I-40.10-00
4 - STORM DRAIN INLET PROTECTION (1 EA.) - SEE STD. PLAN I-40.20-00

HIGH VISIBILITY FENCE QUANTITY SCHEDULE

TO BE STAKED BY THE CONTRACTING AGENCY
SEE STD. PLAN I-10.10

QUANTITY NOTE	QUANTITY (L.F.)
A	204
B	126
TOTAL	330

FILE NAME	G:\DESIGN\XL6279 I-5US 101 McAllister Creek & Mud Bay Bridges - Repair BridgePiles_CAD_Sheets\XL6279_PS_EN.dgn				REGION NO. 10	STATE WASH	FED.AID PROJ.NO. NHPP-0053(982)
TIME	1:16:18 PM						
DATE	8/3/2021						
PLOTTED BY	bailerm				JOB NUMBER XL6279		
DESIGNED BY	R. BAILEY						
ENTERED BY	R. BAILEY						
CHECKED BY	D. JONES				CONTRACT NO.		LOCATION NO.
PROJ. ENGR.	B. WHITEHOUSE						
REGIONAL ADM.	J. WYNANDS	REVISION	DATE	BY			

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

Washington State Department of Transportation

I-5/US-101
MCALLISTER CREEK & MUD BAY BRIDGES
REPAIR BRIDGE PILES

SITE PREP / TESC PLAN

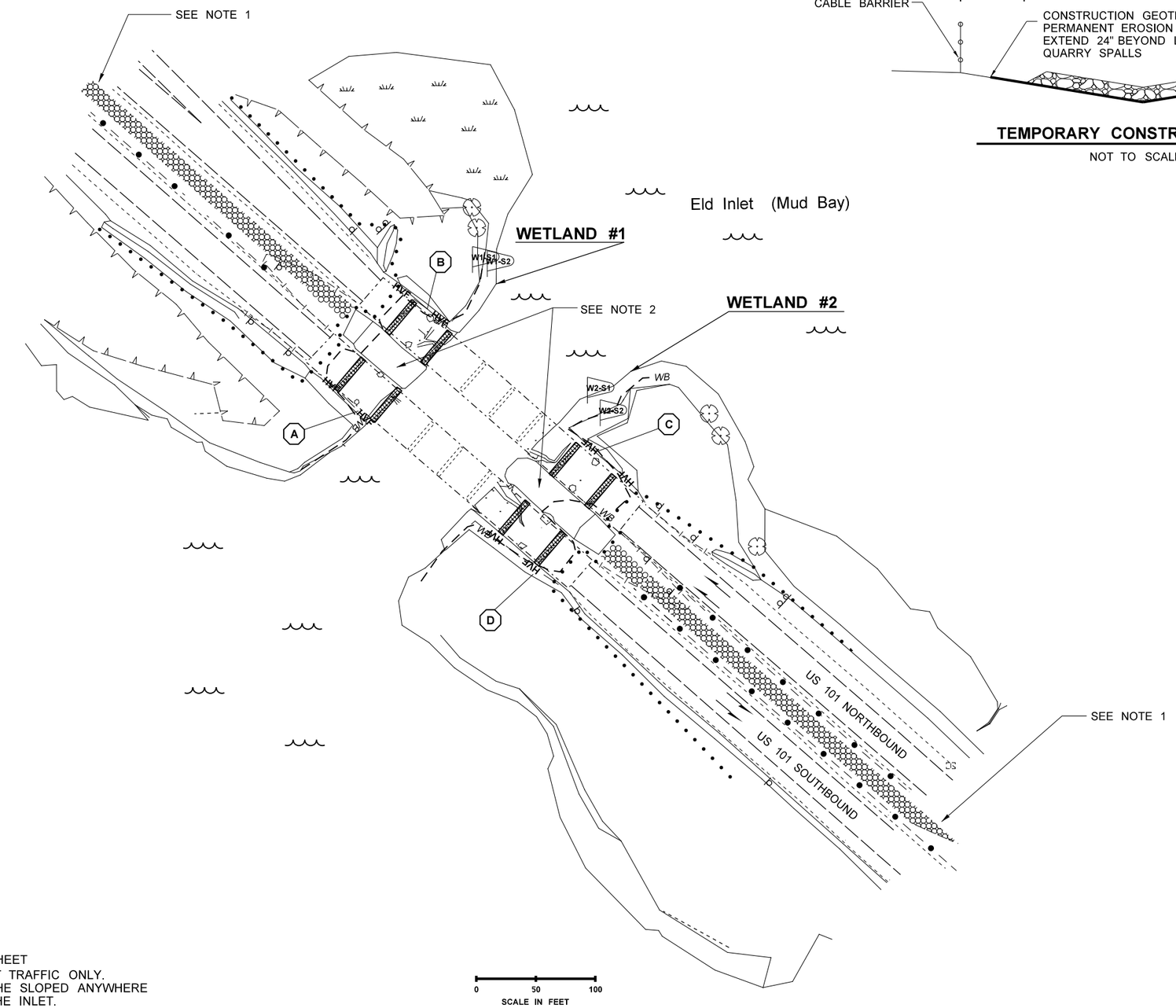
Plot 2
PLAN REF NO **SP2**
SHEET
OF
SHEETS

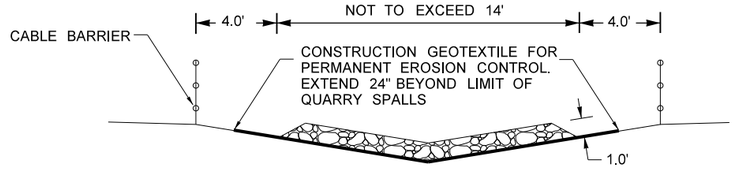
T.18N., R.2W., 18 W.M.

HIGH VISIBILITY FENCE QUANTITY SCHEDULE

TO BE STAKED BY THE CONTRACTING AGENCY
SEE STD. PLAN I-10.10

QUANTITY NOTE	QUANTITY (L.F.)
A	76
B	78
C	95
D	98
TOTAL	347





TEMPORARY CONSTRUCTION ACCESS

NOT TO SCALE

N

LEGEND

- QUANTITY NOTE
- CABLE BARRIER
- EXISTING GUARDRAIL
- WETLAND BUFFER
- WETLAND BOUNDARY — WB —
- PROPOSED COLUMN EXCAVATION AREAS
- HIGH VISIBILITY FENCING — HVF —
- TEMPORARY CONSTRUCTION ACCESS
- SILT FENCE — SF —
- EXISTING SIGN
- GRATE INLET TYPE 2
- TREE
- BORE HOLE
- TYPE 1 JUNCTION BOX EXISTING
- SURVEY MONUMENT
- BRIDGE COLUMN NOT INCLUDED
- CONCRETE BARRIER
- WETLANDS
- EXISTING STRUCTURE

NOTES

1 - TEMPORARY CONSTRUCTION ACCESS - SEE DETAIL THIS SHEET
2 - ACCESS TO THE INLET AND COLUMNS SHALL BE BY FOOT TRAFFIC ONLY. NO MOTORIZED EQUIPMENT OR VEHICLES ALLOWED ON THE SLOPED ANYWHERE BELOW THE SLOPES LEADING FROM US 101 DOWN TO THE INLET.

FILE NAME	G:\DESIGN\XL6279 I-5US 101 McAllister Creek & Mud Bay Bridges - Repair BridgePiles_CAD_Sheets\XL6279_PS_EN.dgn				REGION NO. 10	STATE WASH	FED.AID PROJ.NO. NHPP-0053(982)
TIME	1:16:04 PM						
DATE	8/3/2021				JOB NUMBER XL6279		
PLOTTED BY	bailerm						
DESIGNED BY	R. BAILEY				CONTRACT NO.		LOCATION NO.
ENTERED BY	R. BAILEY						
CHECKED BY	D. JONES						
PROJ. ENGR.	B. WHITEHOUSE						
REGIONAL ADM.	J. WYNANDS	REVISION	DATE	BY			

P.E. STAMP BOX — DATE

P.E. STAMP BOX — DATE

Washington State Department of Transportation

I-5/US-101
MCALLISTER CREEK & MUD BAY BRIDGES
REPAIR BRIDGE PILES

SITE PREP / TESC PLAN

Plot 1
PLAN REF NO SP1
SHEET
OF
SHEETS