



# **WETLANDS AND STREAMS CRITICAL AREAS REPORT**

Kersh-Wishkah Flood Wall Project

Grays Harbor County, Washington

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## ACRONYMS AND ABBREVIATIONS

%	Percent
°F	Degrees Fahrenheit
AMEC	AMEC Environment & Infrastructure, Inc.
County	Grays Harbor County
CWA	Clean Water Act
EPA	United States Environmental Protection Agency
GHCC	Grays Harbor County Code
GIS	Geographical Information Systems
GPS	Global Positioning System
HCA	Habitat Conservation Areas
HGM	Hydrogeomorphic
HPA	Hydraulic Project Approval
NAVD	North American Vertical Datum
non-RPW	Non-Relatively Permanent Water
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
PEM	Palustrine Emergent
PFO	Palustrine Forested
PSS	Palustrine Scrub Shrub
RCW	Revised Code of Washington
ROW	Right-of-Way
RPW	Relatively Permanent Water
SMP	Shoreline Master Program
TNW	Traditional Navigable Water
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

Wetlands and Streams Critical Areas Report  
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USGS	United States Geological Survey
WAC	Washington Administrative Code
WDOE	Washington Department of Ecology
WDFW	Washington State Department of Fish and Wildlife
WRIA	Water Resource Inventory Area

## EXECUTIVE SUMMARY

AMEC Environment & Infrastructure, Inc. (AMEC) delineated wetland boundaries, streams, and shorelines for the Kersh-Wishkah Flood Wall project located in unincorporated Grays Harbor County, Washington. The review area included the Wishkah Road right-of-way and additional areas west and east of the road likely to be impacted by the project. The information in this report is provided to support future permit applications to the United States Army Corps of Engineers (USACE), Washington State Department of Ecology (WDOE), Washington State Department of Fish and Wildlife (WDFW), and Grays Harbor County. This report does not include identification of the following critical areas: fish and wildlife habitat, geologically hazardous areas, frequently flooded areas, or critical aquifer recharge areas.

AMEC performed a field evaluation of streams and wetlands from April 28 to 30, 2014. Maps of the review area showing wetland boundaries and the ordinary high water mark along streams are included as Appendix A. The ordinary high water mark of Wishkah River was delineated along the east side of Wishkah Road. Wishkah River is a shoreline of the state, designated as Type S Water. The shorelands extend 200 feet landward from the OWHM are regulated by the Grays Harbor County Shoreline Master Program.

A freshwater tidal, forested wetland (PFO) is located in the bend of Wishkah River, and abuts the east side of the Wishkah Road fill prism for most of the review area. The wetland (identified as Wetland A) was rated as high-functioning, Category I per the Washington State Wetland Rating System for Western Washington (Hruby 2004). Grays Harbor County Critical Areas Ordinance (Grays Harbor County Code [GHCC] 18.06) requires a 150-foot wide buffer for a Category I wetland.

Wishkah River is classified by USACE as a Traditional Navigable Water (TNW), and Wetland A abuts the TNW. Both are regulated by the USACE.

The ordinary high water mark was delineated along multiple roadside ditches west of Wishkah Road. Surface water in the roadside ditches flows into the Wishkah River through culverts underneath Wishkah Road. Salmonids were present in the ditches at the time of the survey. The ditches are classified as Type F waters, and have a 150-foot buffer per GHCC 18.06.

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# **WETLANDS AND STREAMS CRITICAL AREAS REPORT**

## **Kersh-Wishkah Flood Wall Project Grays Harbor County, Washington**

### **1.0 INTRODUCTION**

AMEC Environment & Infrastructure, Inc. (AMEC) delineated wetland boundaries and ordinary high water marks (OHWM) at the Kersh-Wishkah Flood Wall project site located in unincorporated Grays Harbor County, Washington. The review area included the Wishkah Road right-of-way and additional areas west and east of the road likely to be impacted by the project. AMEC performed a field evaluation of stream and wetland vegetation, hydrologic conditions, and soils from April 28 to 30, 2014.

This report describes the field inventory methods used, includes some of the field data gathered, assesses the value and functions of the delineated wetlands, and lists the buffer requirements for wetlands and streams in the review area. It does not include identification of the following critical areas: fish and wildlife habitat, geologically hazardous areas, frequently flooded areas, or critical aquifer recharge areas.

The information in this report is provided to support future permit applications to the United States Army Corps of Engineers (USACE), Washington State Department of Ecology (WDOE), Washington State Department of Fish and Wildlife (WDFW), and Grays Harbor County.

### **1.1 PROJECT DESCRIPTION AND REVIEW AREA LOCATION**

The proposed Kersh-Wishkah Flood Wall project would be located north of the City of Aberdeen, Washington, along Wishkah Road, between mile posts 2.2 and 2.7 in Grays Harbor County (Figure 1 within Section 33 of Township 18 North, Range 9 West. The project would mitigate flooding of the roadway and adjacent residences by the Wishkah River.

The existing Wishkah Road is a two-lane, paved County-owned road built on engineered fill in the river floodplain. Single-family residences are located west and east of Wishkah Road. Three named dead-end minor streets - Baretich Road, Frosty Road, and Hoffman Road - connect to Wishkah Road from the west.

In the review area, the Wishkah River is located east of Wishkah Road, and flood waters overtop Wishkah Road two to three times a year (AMEC, 2013). The Wishkah River is tidally influenced in the review area. The purpose of the proposed flood wall is to prevent flooding of the roadway and to maintaining access for emergency services during flood events. The proposed flood wall would be approximately 2,700 feet long, and constructed to an approximate top elevation of 16 to 17 feet NAVD (North American Vertical Datum 1988), which is approximately 5 feet above the top of the existing roadway surface. Grays Harbor County plans to purchase the two parcels east of Wishkah Road and adjacent to Wishkah River to accommodate the design and construction of the flood wall along the east side of the road fill prism.

Seven culverts convey water under the Wishkah road prism from west to east. Four of the culverts have catch basins with inlets west of the road with flap gates on the east of the road (the discharge side) to prevent backflow when the water levels are high. Three other culverts without flap gates convey water in both directions under the road – east toward the river when the water level in the ditches is higher than the water level in the river, and west into the roadside ditches when the river water levels are higher than the water level in the ditches.

The review area focused on the portion of Wishkah Road where the flood wall is proposed, and the adjacent right-of-way.

## **1.2 WETLAND REGULATORY ENVIRONMENT**

The United States Environmental Protection Agency (EPA) and USACE regulate wetlands and other waters of the United States under Section 404 of the CWA. The 2006 Rapanos Supreme Court decision held that EPA and USACE maintain jurisdiction over traditional navigable waters (TNW), wetlands adjacent to or abutting TNW, non-navigable tributaries of TNW that are relatively permanent waters (RPW), and wetlands that abut such tributaries. For those wetlands associated with non-navigable tributaries that are not relatively permanent waters (non-RPW), the agencies will assert jurisdiction where they are found to have a significant nexus to a TNW.

The Washington State Department of Ecology (WDOE) asserts jurisdiction over wetlands in Washington under Section 401 (Water Quality Certification) of the CWA, the State's Growth Management Act (Revised Code of Washington [RCW] 36.70A.060), and the Water Pollution Control Act (Washington Administrative Code [WAC] 90.48). Wetlands are regulated by Grays Harbor County (County) under their Critical Areas Ordinance (GHCC 18.06).

Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a

prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987/2010, and the State Growth Management Act [RCW 36.70A]).

## **2.0 METHODS**

AMEC conducted a field investigation within the review area on April 28, 29, and 30, 2014, to identify wetlands and other waters of the U.S., and delineate their boundaries and/or ordinary high water marks. Each delineated wetland was rated according to WDOE’s Wetland Rating System for Western Washington (Hruby 2004). Prior to the field investigation, AMEC staff reviewed wetland maps and obtained relevant background information about the local area.

### **2.1 REVIEW OF AVAILABLE PUBLISHED INFORMATION**

Available site information was reviewed prior to the field effort to identify any previously documented wetlands, streams, or other site characteristics (e.g., vegetation patterns, topography, soils, or water courses) that would indicate the presence of wetlands and streams within the review area. These maps are typically used as guidance, and do not supersede conditions in the field.

As part of this effort, AMEC staff reviewed the following sources:

- United States Geological Survey (USGS) Topographic Map, Aberdeen Gardens quadrangle, Washington, dated 1990;
- Aerial Photographs – Google Earth (Google, 2013);
- Grays Harbor County Shoreline Master Plan Maps – Map 18-09 (Grays Harbor County, 2014);
- Washington State Department of Fish and Wildlife (WDFW) SalmonScape (WDFW, 2014b);
- Soils map and hydric soil list from the United States Department of Agriculture Natural Resources Conservation Service (NRCS 2014a);
- National Wetlands Inventory (United States Fish and Wildlife Service [USFWS] 2014); and,
- WDFW - Habitats and Priority Species Database (WDFW 2014a).

### **2.2 WETLANDS - FIELD INVESTIGATION**

AMEC scientists delineated the wetlands using the three-parameter approach detailed in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Region*

(Version 2.0) (USACE 2010). The *Regional Supplement* provides detailed regional guidance on identifying and interpreting field indicators for wetland hydrology, soils, and vegetation.

In general, to qualify as a wetland, specific vegetation, soil features, and hydrologic characteristics must be present. Definitions and wetland indicators for each of these three parameters are presented in Table 1. If an area exhibits characteristics for all three wetland parameters, or normally would exhibit those characteristics, the area is considered to be a wetland. If an area does not exhibit all three wetland parameters then it is not considered a wetland.

To verify that the review area was thoroughly investigated for the presence or absence of wetlands and streams, the review area was walked to examine vegetation, soil, and hydrologic conditions. When wetland areas were positively identified, their boundaries were delineated using the three-parameter approach by assessing the presence or absence of field indicators. If wetlands or watercourses extended out of the review area, AMEC scientists documented the direction of flow and estimated their extents on field maps.

Wetland Determination Data Forms were completed at 12 data points to document wetland and upland conditions for wetland boundary determinations. Wetland boundaries were flagged in the field with sequentially numbered, pink flagging marked "WETLAND BOUNDARY." Data point locations are shown on detailed wetland delineation maps provided in Appendix A. The completed wetland determination data forms are provided in Appendix B, and the data points are shown on Figure 5 in Appendix A. The wetland rating forms are provided in Appendix C. Photographs of the review area are provided in Appendix D.

Wetland boundary and ordinary high water flag locations were field mapped by professional surveyors contracted by AMEC. Survey information was transferred to a geographic information system (GIS) for map production. Wetland polygon areas were calculated and Cowardin cover classes (Cowardin et al., 1979) were determined with the aid of aerial photography and field data.



**Table 1 Indicators of the Three Wetland Parameters**

Parameter	Indicators
Wetland Vegetation	<p>Dominant vegetation consists of wetland-adapted plant species, based on one or more of the following indicators:</p> <ul style="list-style-type: none"> <li>• Dominance Test: more than 50% of dominant vegetation is of facultative, facultative wetland, or obligate status as determined from the National List of Plant Species Occurring in Wetlands (Lichvar and Kartesz 2009).</li> <li>• Prevalence Index: Prevalence index is 3.0 or less. The prevalence index is a weighted average that takes into account plant abundance and indicator status.</li> <li>• Plant morphological characteristics are evident.</li> </ul>
Hydric Soils	<p>A <i>hydric soil</i> is a soil that formed under conditions of saturation, flooding, or ponding that persist long enough during the growing season to develop anaerobic conditions in the upper part of the soil. Hydric soils generally exhibit one or more of the following indicators:</p> <ul style="list-style-type: none"> <li>• Histosol (highly organic soil)</li> <li>• Histic epipedon (organic soil surface layer)</li> <li>• Sulfidic material (rotten-egg odor)</li> <li>• Aquic or peraquic moisture regime (saturation during the growing season)</li> <li>• Soil matrix colors that indicate a loss or movement of organic matter, iron, or manganese</li> <li>• The presence of redoximorphic features, which are locations within the soil structure of iron and manganese depositions and depletions</li> <li>• The presence of oxidized iron and manganese in specific abundance and distribution</li> </ul>
Wetland Hydrologic Conditions	<p>Wetland hydrologic conditions, indicated by one or more of the following indicators:</p> <ul style="list-style-type: none"> <li>• Surface inundation visible on ground or aerial imagery</li> <li>• Standing water or saturated soils at or above a depth of 12 inches for fine textured soil</li> <li>• Surface water</li> <li>• High Water Table</li> <li>• Oxidized rhizospheres along living roots</li> <li>• Frost-Heave Hummocks</li> <li>• Waterborne sediment deposits</li> <li>• Water-stained or surface-scoured leaves</li> <li>• Wetland drainage patterns</li> <li>• Geomorphic position</li> <li>• FAC-neutral test</li> <li>• Stunted or stressed plants</li> </ul>

Source: USACE 2010

## 2.2.1 Vegetation

Vegetation communities were observed during the field work throughout the study area. Representative vegetation communities were documented at 12 data point locations. For each data point, three strata were inventoried, including trees within a 30-foot radius, shrubs within a 15-foot radius, and non-woody herbaceous plants (including forbs, grasses, sedges, and rushes) within a 5-foot radius of the sample point.

Plant species in each stratum were identified and the percentage cover for each species was recorded on a wetland determination data form. Each species was identified and listed following the scientific nomenclature given in the United States Department of Agriculture (USDA) PLANTS database (NRCS 2014b). The wetland indicator status for each species was assigned using the 2012 National Wetland Plant List (Lichvar and Kartesz 2009). The definitions for the indicator status are presented in Table 2.

**Table 2 Definitions of Indicator Status**

Indicator Symbol	Definition
OBL	<i>Obligate</i> . Species that almost always occur in wetlands (estimated probability greater than 99%) under natural conditions.
FACW	<i>Facultative wetland</i> . Species that usually occur in wetlands (estimated probability 67 to 99%), but occasionally are found in uplands.
FAC	<i>Facultative</i> . Species that are equally likely to occur in wetlands or uplands (estimated probability 34 to 66%).
FACU	<i>Facultative upland</i> . Species that usually occur in uplands (estimated probability 67 to 99%), but occasionally are found in wetlands.
UPL	<i>Upland</i> . Species that almost always occur in uplands under normal conditions (estimated probability greater than 99%).
NL	<i>Not Listed</i> . Species was not included in evaluation and does not have an indicator status. More often occurs with plant species that would be categorized as UPL if they had been included in the evaluation.
NI	<i>No indicator</i> . Species for which insufficient information was available to determine an indicator status.

Source: USACE 2010

Plant indicator status and the dominance test were used to determine the presence or absence of a wetland vegetation community. A location is considered to have a wetland vegetation community if more than 50 percent of the dominant species have an indicator status of FAC, FACW, or OBL. Dominant species are defined as those that individually or collectively account for more than 50 percent of the total areal coverage of vegetation in the stratum, plus any other species that, by itself, accounts for at least 20 percent of the total areal coverage (USACE 2010). If more than 50

percent of the dominant plant species in a community have wetland indicator status of OBL, FACW, or FAC, then the plant community is considered hydrophytic (wetland).

### **2.2.2 Hydric Soil**

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (USACE 2010). Hydric soils exhibit certain characteristics that can be observed in the field. Such characteristics or indicators include high organic content, accumulation of sulfidic material, greenish or bluish-gray color (gley formation), and development of redoximorphic features. Hydric soil field indicators were evaluated per the *Field Indicators of Hydric Soils in the United States* (NRCS 2010) and the *Regional Supplement* (USACE 2010).

Soil samples were obtained at representative data points by digging a pit to a depth of at least 18 inches. Soil samples were then examined for hydric indicators. Soil colors were evaluated against a Munsell® soil color chart (Gretag Macbeth LLC 2000) to distinguish hydric from non-hydric soils.

### **2.2.3 Hydrology**

While wetlands are defined in part by the presence of water, water does not need to be present throughout the entire year for an area to be considered a wetland. Wetland hydrologic conditions are considered present if, during the growing season, an area has 14 or more consecutive days of flooding or ponding, or a water table 12 inches or less below the soil surface, depending on soil and plant community conditions (USACE 2010).

The presence of wetland hydrologic indicators was determined at each wetland data point. Primary indicators of wetland hydrology generally include areas of ponding or soil saturation, shallow water table and evidence of previous water inundation or saturation (i.e., watermarks, drift lines, sediment deposits, and oxidized root channels). Secondary indicators include, but are not limited to, wetland drainage patterns, geomorphic position, and frost/heave hummocks. When at least one primary or two secondary indicators were observed, wetland hydrology was assumed to occur during the growing season long enough to result in wetland conditions.

### **2.2.4 Evaluation of the Growing Season**

In the Pacific Northwest coast region, the beginning and ending dates of the growing season can be defined based on two indicators of biological activity that are readily observable in the field: (1) above ground growth and development of vascular plants, and (2) soil temperature (USACE 2010). However, due to seasonal fluctuations from year to year the growing season dates may also be approximated by the number of frost-free days, defined as the time from the last date in spring

when the ambient air temperature drops to 28 degrees Fahrenheit (°F), to the first date in fall when it drops to 28°F, over a 30-year period (NRCS 2002).

Using climate data from Aberdeen, the beginning and ending dates for the growing season in the review area were estimated from long-term weather records as the median dates (50 percent probability) for the first and last 28°F days. Based on long-term weather records, the average start and end dates for the growing season are February 10 and December 13, respectively, for a total growing season of 305 days (NRCS 2002).

## **2.3 WETLAND CLASSIFICATION AND RATINGS**

Wetlands were classified based on two different wetland classification schemes:

- Wetland vegetation communities were classified following the system developed by Cowardin, et al. (1979);
- Hydrogeomorphic wetland classification was assigned following Brinson (1993).

The Washington State Wetlands Rating System for Western Washington (Hruby 2004) was then used to rate wetlands based on their rarity, sensitivity, and wetland functions and values.

The Cowardin system was designed to apply a hierarchical classification system to wetlands with respect to their position in the landscape, habitat/vegetative form, hydrologic conditions, and water quality conditions (Cowardin, et al. 1979). The highest level of the classification hierarchy defines five different wetland systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine.

Hydrogeomorphic (HGM) classification for wetlands clarifies the relationship between hydrology and geomorphology for a wetland system. The classification system is based on the geomorphic setting, water source, and hydrodynamic patterns for each wetland. These three elements are responsible for maintaining many of the functional features of wetland ecosystems (Brinson 1993).

Wetlands were rated based on rarity, sensitivity, and wetland functions and values using *Washington State Wetlands Rating System for Western Washington* (Hruby 2004). The method uses the wetland's HGM classification to guide the evaluation. In this rating system, wetlands are categorized as Category I, II, III, or IV based on the results of the evaluation. Category I wetlands are characterized as highly functional, sensitive and rare, while Category IV wetlands are low functioning, disturbed, and relatively common in some settings. Category II and Category III wetlands provide a moderate level of wetland functions. The Wetland Assessment Units used for wetland ratings in this study were determined as directed by Hruby (2004).

Wetland ratings are used to assign wetland buffer widths per GHCC, and may be used to determine compensation ratios if wetlands are disturbed during a proposed development. Completed wetland rating forms are included as Appendix C.

## 2.4 STREAMS

AMEC scientists delineated OHWM along the river, streams and other drainages in accordance with WDOE's method described in *Determining the Ordinary High Water Mark on Streams in Washington State* (Olson and Stockdale 2010). Factors used in determining ordinary high water included an assessment of stream bank characteristics, scour lines, vegetation communities, and depositional areas. Indicators include marks upon the soil that create a distinction between that of the abutting upland, and a change in vegetation.

If riverine wetlands directly abutted tidally influenced stream or river channels, then the outer boundary of the wetland was used to delineate ordinary high water. The location of the ordinary high water on streams was determined in the field, marked with flagging, and surveyed. The tidal channels within wetlands were estimated using topographic survey and aerial photographs.

Regulatory stream classification follows the guidance of WAC 222-16-030 and -031. Additionally, Grays Harbor County regulates streams as Habitat Conservation Areas (HCAs). Streams were classified according to the State of Washington criteria, and Grays Harbor County follows the same system per GHCC 18.06.140(A)1 (Table 3).

**Table 3 State of Washington Steam Types and Descriptions**

Type	Description
Type S	All waters, within their bankfull width, inventoried as "shorelines of the state," including periodically inundated areas of their associated wetlands.
Type F	Segments of natural waters other than Type S waters, which are within the bankfull widths of defined channels and periodically inundated areas of their associated wetlands, or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at seasonal low water, and which may contain fish habitat.
Type Np	All segments of natural waters within the bankfull width of defined channels that are perennial non-fish habitat streams. <i>Perennial streams</i> are flowing waters that do not go dry during any part of a year of normal rainfall and include intermittent dry portions of the perennial channel below the uppermost point of perennial flow.
Type Ns	All segments of natural waters within the bankfull width of the defined channels that are not Type S, F, or Np waters. These are seasonal, non-fish habitat streams in which surface flow is not present for at least some portion of a normal rainfall year.

Source: WAC 222-16-030

## **2.5 SHORELINES**

AMEC scientists reviewed the Grays Harbor County Shoreline Master Program (SMP) text and maps to determine the extent of the regulated shoreline within the review area. SMP jurisdiction is based on SMP mapping, OHWM, floodways, wetlands, and floodplains. AMEC scientists determined the OHWM consistent with the state law as defined in RCW 90.58.030, and described under Streams, above.

### **3.0 RESULTS**

This section presents the results of the background literature review and the field investigation.

West of Wishkah Road in the review area the OHWM of several roadside drainages were delineated, and on the east side a large wetland (Wetland A) was delineated in the floodplain of Wishkah River. Tidal channels were identified below the OHWM of Wishkah River in Wetland A.

The following presents a summary of topography, soil series, and vegetation communities in the review area. Details on streams and drainages is provided in Section 3.2, and a description of Wetland A is presented in Section 3.3. Photographs of the review area, streams, and wetlands are provided in Appendix D.

#### **3.1 REVIEW AREA DESCRIPTION**

The review area is located in a rural residential area north of Aberdeen in Grays Harbor County, Washington. Wishkah Road travels north and south through the review area, and several dead-end roads connect to it from the west. Single family residences and commercial lots line the west side of Wishkah Road, and two residential parcels are located east of Wishkah Road.

An intermittently used fishing shack has been built on one parcel, and the second parcel lying to the north has a residence with several other smaller buildings (Figure 2 in Appendix A). West of Wishkah Road has been developed as residential with lawns and driveways separated by forested areas and shrubby hedgerows. Ditches border the west side of Wishkah Road.

##### **3.1.1 Topography**

The review area is relatively flat and slopes gently south (Figure 3 in Appendix A). The elevation of Wishkah Road ranges from approximately 10 feet to 15 feet. The road fill prism sits approximately two to three feet above the surrounding river floodplain.

### 3.1.2 Soils

The NRCS (2014a) has mapped two soil series in the review area, Lytell and Ocosta (Figure 4 in Appendix A). The Ocosta series consists of very deep, poorly drained soils that formed in alluvium deposited in coastal bays. It occurs on flat or depressed areas subject to overflows from nearby surface waters. The Ocosta series is considered hydric. The Lytell series consists of deep, well drained soils that formed in material weathered from siltstone or very fine grained sandstone. Lytell soils occur on hillsides and ridgetops, and have slopes of 30 to 65 percent on the hillside west of the review area. Details on these soils are provided in Table 4.

**Table 4 Soil Series in the Review Area**

Soil Series	Slope (%)	Drainage Class	Landscape Position	Hydric Classification
Lytell silt loam	30 to 65	Well drained	Hillsides and ridgetops	Not hydric
Ocosta silty clay loam	-	Poorly drained	Alluvial flats or depressions subject to overflow	Hydric

### 3.1.3 Vegetation

The review area is bordered to the east by a forested, floodplain wetland and the Wishkah River. An emergent plant community typically borders the top of bank along the Wishkah River at the forest edge. Forest, shrub, and emergent communities border the eastern edge of Wishkah Road.

Vegetation communities west of Wishkah Road include residential lawns, forest and shrub hedgerows between lots, and former pastures with pockets of shrub and grass communities.

Wishkah Road is constructed on gravel fill, and the slopes are mostly unvegetated.

## 3.2 STREAMS AND DRAINAGES

The review area is located within the Wishkah River floodplain, and lies at a bend in the Wishkah River. The review area is located in WDOE's Water Resource Inventory Area 22 (WRIA 22). The Wishkah River is located east of Wishkah Road, and several roadside drainages abut the west side of Wishkah Road (Figure 5 in Appendix A).

### 3.2.1 Wishkah River

The Wishkah River flows east of the review area. It is a perennial river that is tidally influenced, and flows southward to Grays Harbor through Aberdeen. Wishkah Road parallels the river's west bank



in the north and south ends of the review area. Wishkah River is a Type S stream. Type S waters have a 150-foot buffer per GHC 18.06.140-(A)8.

The OHWM associated with Wishkah River was delineated in the field. Field indicators used to determine the OHWM included change in vegetation, change in topography, soil type, and water marks.

A large, contiguous wetland is situated between Wishkah Road and Wishkah River, identified as Wetland A. The river's OHWM line follows the boundary of Wetland A because Wetland A is affected by the tidal inundation and is considered part of the river system. At the southern end of the review area, water marks were evident at the base of the gravel road fill that supports Wishkah Road.

### **3.2.1.1 Shorelines**

Wishkah River is a shoreline under the jurisdiction of the Grays Harbor SMP (Figure 6 in Appendix A), and the wetland boundary which coincides with the OHWM delineates the shoreline's boundary. This line is used for determining shoreland areas per the SMP. The shoreland area extends 200 feet from the Wetland boundary/OHWM.

### **3.2.2 Roadside Drainages**

Several roadside drainage ditches are located within the review area. Roughly three separate, unnamed tributaries to the Wishkah River flow eastward to the Wishkah River in the review area. The tributaries flow in roadside ditches with patches of emergent vegetation, and then through three culverts underneath Wishkah Road to Wishkah River. No tidegates are present on the culvert outlets east of Wishkah Road, which allows fish passage to the roadside ditches west of Wishkah Road under most conditions. However, tidegates are present on culverts underneath Baretich, Hoffman, and Frosty Roads that connect these ditches.

Per WAC 222-16-030, the segments connected to open culverts are Type F streams, and the ditches behind culverts with tidegates are also classified as Type F due to the human-made obstruction to fish passage (e.g., tidegate). Type F waters have a 150-foot buffer per GHCC 18.06.140-(A)8.

Fish were identified during the site investigation in the ditches west of Wishkah Road, including: threespine stickleback (*Gasterosteus aculeatus*), juvenile coho salmon (*Oncorhynchus kisutch*), sculpin family (*Cottidae*), and Olympic mudminnow (*Novumbra hubbsi*).

At the time of the field investigation, ditches on both the north and south sides of Baretich and Frosty Roads had approximately 3 to 12 inches of flowing water. Water was also flowing in the ditches that parallel Wishkah Road. The OHWM along the roadside edge of these ditches was delineated in the field. The wetland fringe along the edges of the ditches was included within the OHWM boundaries.

Table 5 summarizes the streams and drainages within the review area.

**Table 5 Summary of Streams and Drainages Classifications**

<b>Watercourse</b>	<b>General Location</b>	<b>WDOE/GHC Stream Type</b>	<b>USACE Classification</b>	<b>Buffer (feet)</b>
Wishkah River	East of Wishkah Road	S	TNW	150
Drainage Ditches	West of Wishkah Road	F	RPW	150

Note. WDOE = Washington Department of Ecology; GHC = Grays Harbor County; USACE = U.S. Army Corps of Engineers; S=shoreline of the state; F = fish-bearing; TNW = traditional navigable water; RPW – relatively permanent water

### **3.3 WETLANDS**

A single wetland (Wetland A) was delineated east of Wishkah Road (Figure 5 in Appendix A).

Wetland determination data sheets are provided in Appendix B, and the data point locations are shown on Figure 5 in Appendix A. Wetland rating forms are provided in Appendix C.

#### **3.3.1 Existing Wetland Mapping**

The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapped one wetland in the review area (Figure 7 in Appendix A) located in the bend of Wishkah River east of Wishkah Road, and is classified as a palustrine, forested, broad-leaved deciduous/needle-leaved evergreen, seasonally flooded wetland (PFO1/4C) (USFWS 2014). This is the same wetland identified as Wetland A in this report.

#### **3.3.2 Wetland A**

**Cowardin Classification: PFO, PSS, PEM**

**Wetland Rating: Riverine, Category 1**

**Buffer Width Requirement: 150 feet**

Wetland A is located in the floodplain of the Wishkah River. Within the wetland area tidal channels convey surface water between the river and wetland. The interior of Wetland A is mostly forested, and shrub and emergent (PEM) communities are situated along the forest edge adjacent to

Wishkah Road, and between Wishkah River and Wishkah Road in the southern portion of the review area.

Species commonly observed in the forest included: sitka spruce (*Picea sitchensis*, FAC), western red cedar (*Thuja plicata*, FAC), and red alder (*Alnus rubra*, FAC) in the overstory. Salmonberry (*Rubus spectabilis*, FAC), Nookta rose (*Rosa nutkana*, FAC), twinberry (*Lonicera involucrata*, FAC) formed the shrub understory. Common species in the understory layer included slough sedge (*Carex obnupta*, OBL), tall horsetail (*Equisetum telmateia*, FACW), ladyfern (*Athyrium filix-femina*, FAC), skunk cabbage (*Lysichiton americanum*, OBL), and Pacific silverweed (*Argentina anserina*, OBL).

Wetland shrub communities included sitka willow (*Salix sitchensis*, FACW), crab apple (*Malus fusca*, FACW), and alder saplings. The emergent wetlands were dominated by slough sedge at the top of bank along the Wishkah River. Along the edge of Wishkah Road reed canarygrass (*Phalaris arundinacea*, FACW), broad-leaved cattail (*Typha latifolia*, OBL), and slough sedge were common.

Upland habitats adjacent to wetland areas typically included red alder, Himalayan blackberry (*Rubus armeniacus*, FACU), salmonberry, reed canarygrass, and sword fern (*Polystichum munitum*, FACU).

Hydric soils in Wetland A frequently consisted of a low-chroma matrix with common, faint to prominent redoximorphic features in pale soil matrices. Wetland soil generally had a matrix color of very dark gray (10YR 3/1), dark gray (10YR 4/1), or dark grayish brown (10YR 4/2) occurring within 6 inches of the surface. Redoximorphic features present consisted of gray (10YR 5/1) or dark yellowish brown (10YR 4/6) depletions. Surface soil textures mainly consisted of loam and silt loam. Hydric soils generally met the definition for one or both of the following hydric soil indicators (NRCS 2010):

- Hydric soil Indicator F3—Depleted Matrix. Indicator F3 is defined as a layer with a depleted or gleyed matrix with 60% or more soil color chroma of 2 or less and a minimum thickness of either (a) 2 inches, if it is entirely within the upper 6 inches of the soil, or (b) 6 inches and starts within 10 inches of the soil surface.
- Hydric soil Indicator F6—Redox Dark Surface. Indicator F6 is defined as a layer occurring entirely within the upper 12 inches, that is at least 4 inches thick, has a matrix value of 3 and a chroma of 2, and has greater than 5% prominent redoximorphic features.

Wetland hydrology is mainly supported by high groundwater levels, inundation from Wishkah River and tidal channels, and surface run-off from the roadway. Primary wetland hydrology indicators (NRCS 2010) observed included standing surface water (A1), shallow water table (A2), and

saturated soil (A3). Secondary wetland hydrology indicators observed included geomorphic position (D2) and drainage patterns (B10).

### **3.3.3 Wetland HGM Classification, Functional Rating, and Buffer Width**

Wetland A was rated as a Category I, high functioning, freshwater tidal wetland. It is located in the floodplain of Wishkah River, and was rated as a riverine wetland in WDOE's *Wetland Rating System for Western Washington* (Hruby 2004). Wetland A is connected to the Wishkah River, which is key to this systems importance in the landscape and to the river system. Wetland A had indicators of the potential to provide high levels of water quality, hydrologic, and wildlife habitat functions.

With regards to water quality functions, surface depressions cover a large portion of the wetland and can function to trap sediments during flood events. Wetland A has vegetation that may trap sediments and Wetland A's opportunity to provide these functions exists because it appears to receive untreated stormwater discharges from Wishkah Road and adjacent residential areas.

Wetland A is located within the floodplain and is situated to receive overbank storage during flood events, and has a dense vegetation community that may slow down flood water velocities.

Wetland A has three vegetation layers and within its extent. Wetland A also has high plant species diversity. Special habitat features present included large woody debris, standing snags, and overhanging vegetation.

Per GHCC 18.06.135(B)6a, the buffer width around Wetland A is 150 feet. Wetland A is a Category I wetland with a habitat score of 26 points.

## **4.0 REGULATIONS**

Agencies with regulatory authority over the wetlands, streams, and drainages in the review area include the USACE, WDOE, WDFW, and Grays Harbor County.

The USACE regulates the discharge of dredged or fill material into wetlands, streams and other drainages that connect to Waters of the United States under Section 404 of the CWA. The USACE requires notification for all disturbances to wetlands, streams, and potentially to other drainages (ditches). The USACE makes jurisdictional determinations regarding these water resources. It is anticipated that the USACE will exert jurisdiction over these streams and wetlands in the review area. The Wishkah River, roadside drainages, and Wetland A in the review area are classified by the USACE as TNW, RPW, and Abutting Wetlands, respectively. As part of the permit review

process, the USACE must verify compliance with Section 7 of the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, and Section 106 of the National Historic Preservation Act. This report does not address these additional compliance requirements.

WDOE has jurisdiction over all wetlands and streams in the review area per RCW 90.48, and authorizes activities in wetlands and streams per Section 401 of the CWA (Water Quality Certification).

The WDFW requires a Hydraulic Project Approval (HPA) prior to any activities that may directly or indirectly affect streams or associated wetlands, likely including the roadside ditches.

Grays Harbor County Critical Area Ordinance (GHCC 18.06) regulates development in Wishkah River, the roadside drainages, wetlands, and their buffers. The Wishkah River and roadside drainages are Type S and F streams, respectively, and are regulated as Habitat Conservation Areas (GHCC 18.06.140) with 150-foot buffers. Wetland A, also regulated by the Critical Areas Ordinance, has a standard 150-foot buffer.

## **5.0 STATEMENT OF LIMITATION**

The wetland boundaries, classifications, ratings, and jurisdictional assessments described herein are the professional opinion of AMEC staff based on the circumstances and site conditions at the time of this study. These professional opinions have been developed in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area, and in accordance with the terms and conditions set forth in our signed proposal. These findings are considered preliminary until local, state, or federal jurisdictions make verification of jurisdiction and confirm the wetland determination, boundary locations, and classifications.

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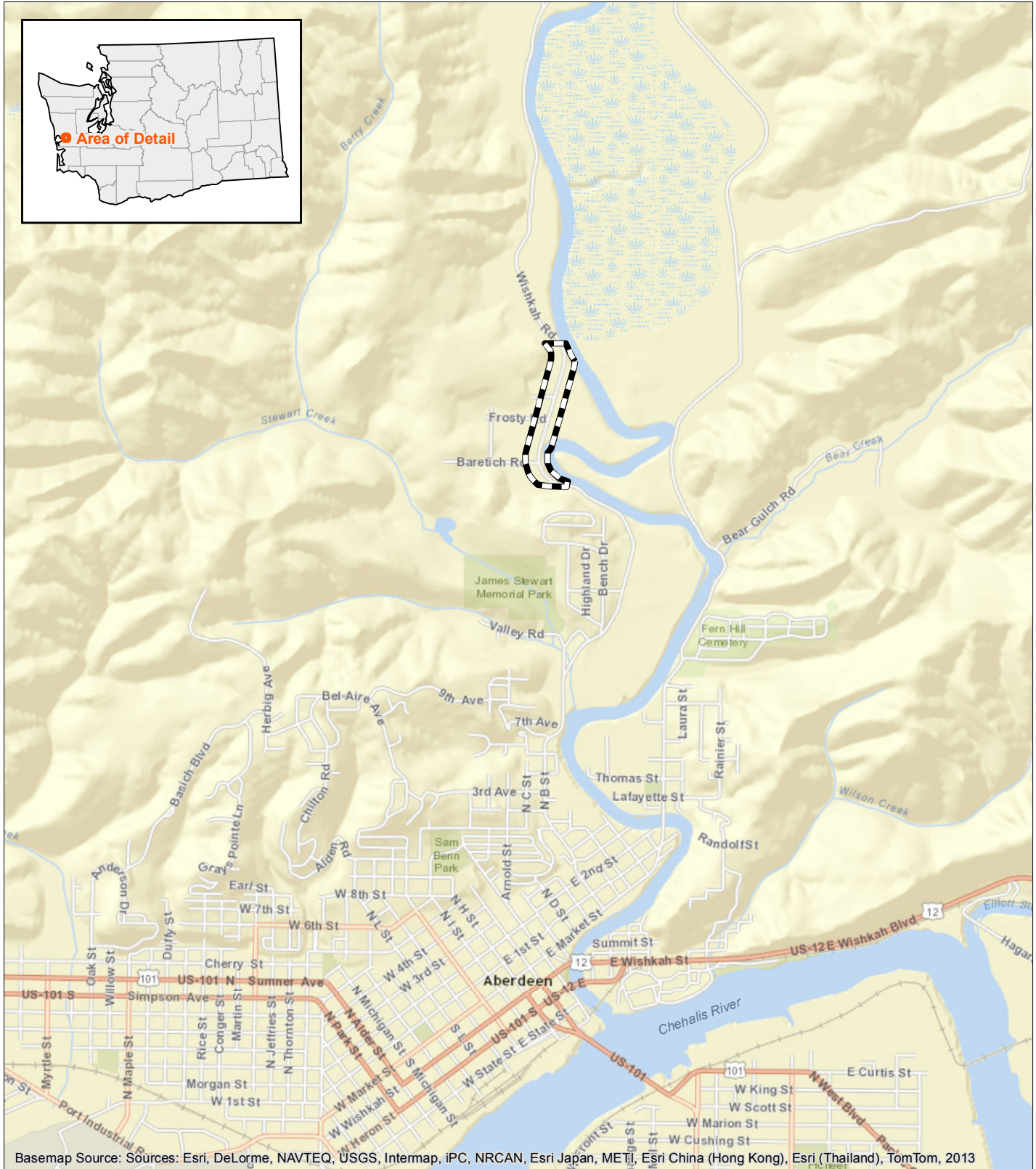


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## APPENDIX A

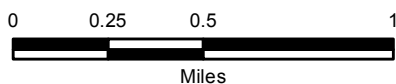
Figures

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Date: August 7, 2014

Figure 1



Project Area



Project Vicinity

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(437,723 5,206,759)

Coordinates for Map Corners

(438,821 5,206,759)



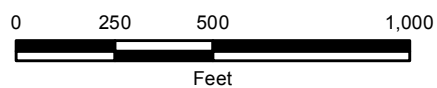
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UTM Zone 10N NAD83

(438,821 5,205,513)

Date: August 7, 2014

Figure 2



Project Area



Project Area

Wishkah Road

3915-17568-A



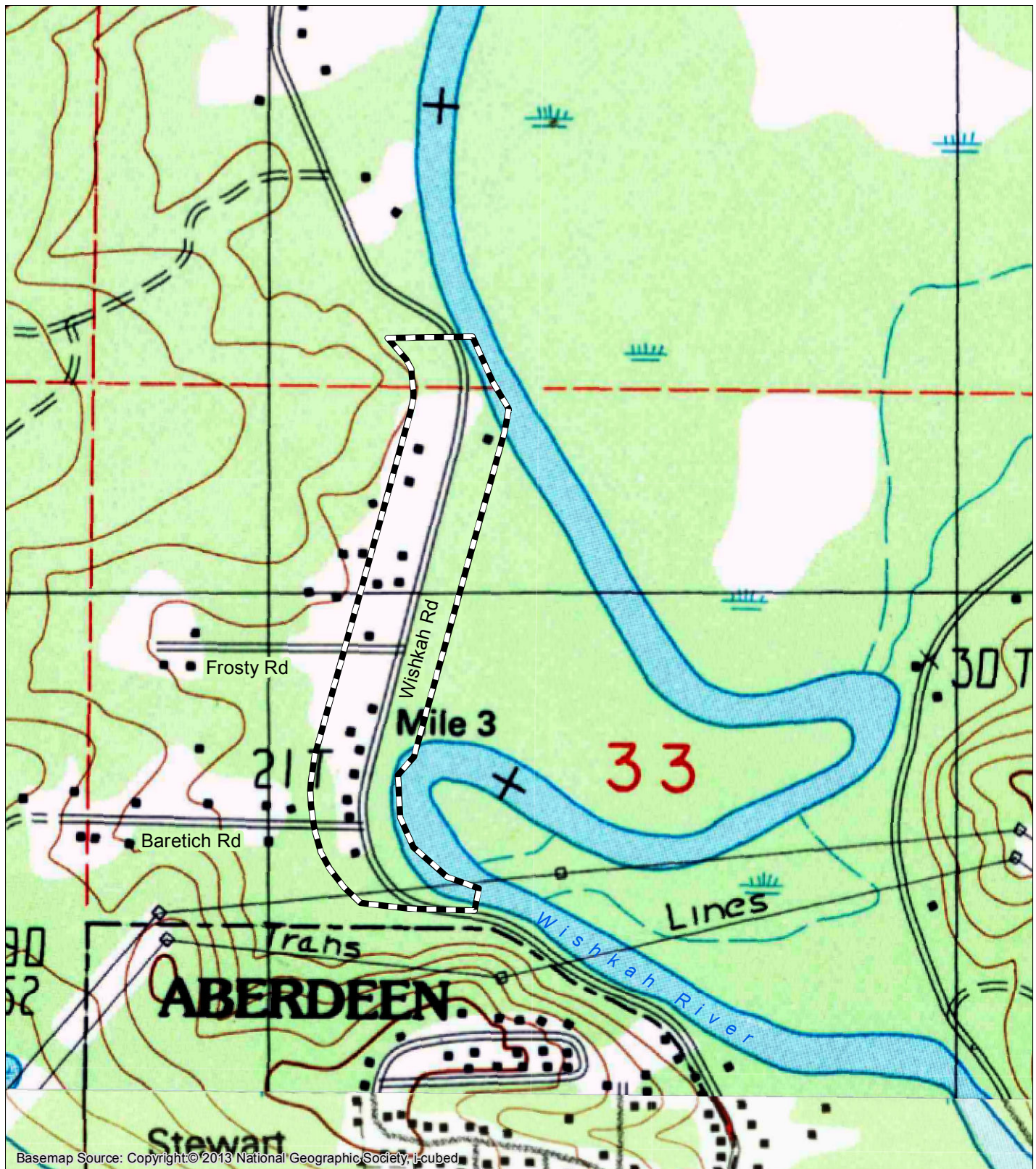
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Coordinates for Map Corners

(439,020 5,207,038)



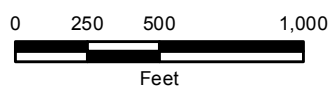
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UTM Zone 10N NAD83

(439,020 5,205,336)

Date: August 7, 2014

Figure 3



Project Area



USGS Topographic Map

USGS 7.5' Topographic Map Series  
Washington Quadrangle: Aberdeen Gardens (1990)  
Section 33 of Township 18 N, Range 9 W, W.M.

Wishkah Road

3915-17568-A



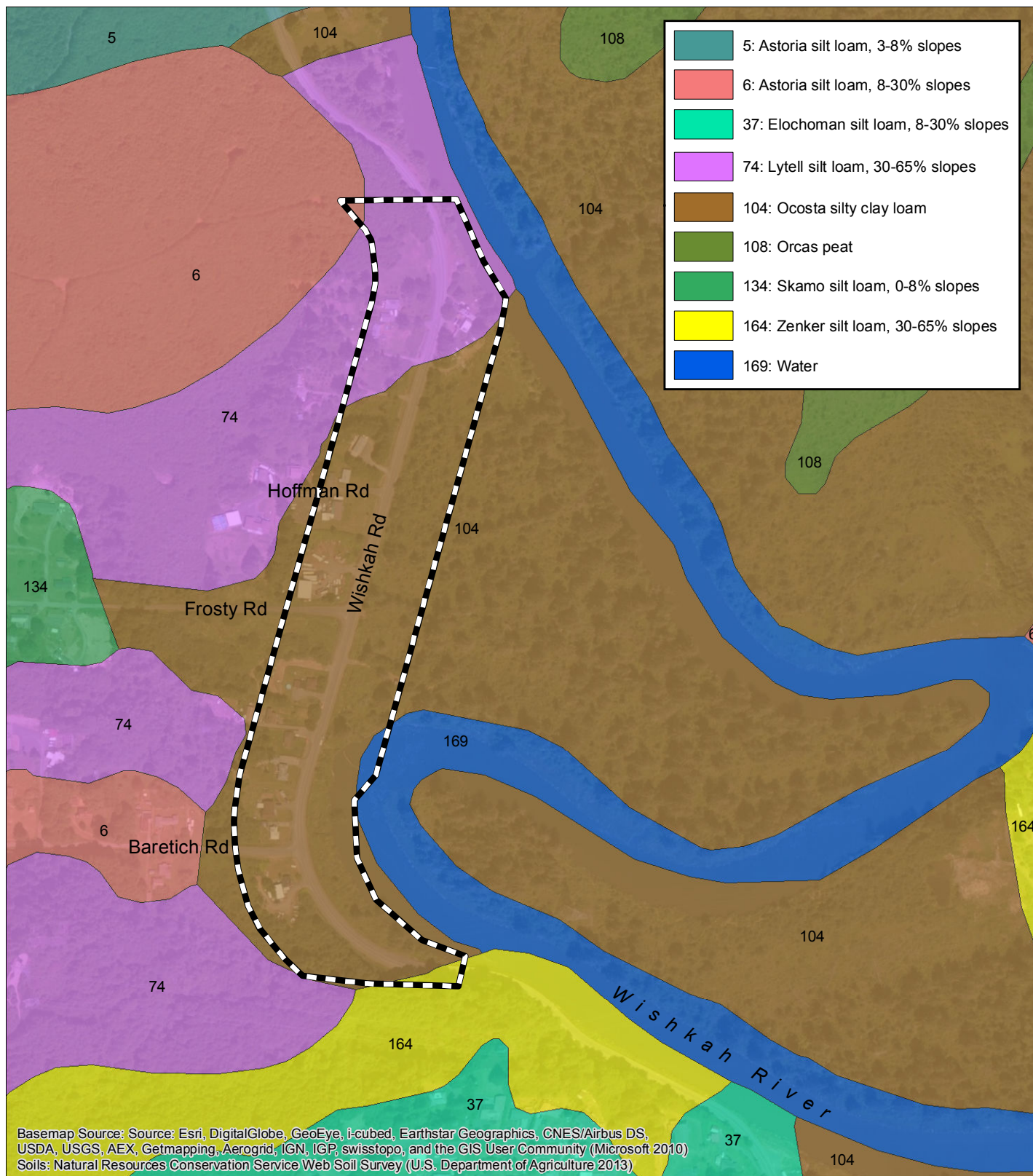
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(437,723 5,206,759)

Coordinates for Map Corners

(438,821 5,206,759)



(437,723 5,205,513)

UTM Zone 10N NAD83

(438,821 5,205,513)

Date: August 7, 2014

Figure 4

0 250 500 1,000  
Feet



Project Area



NRCS Soil Map

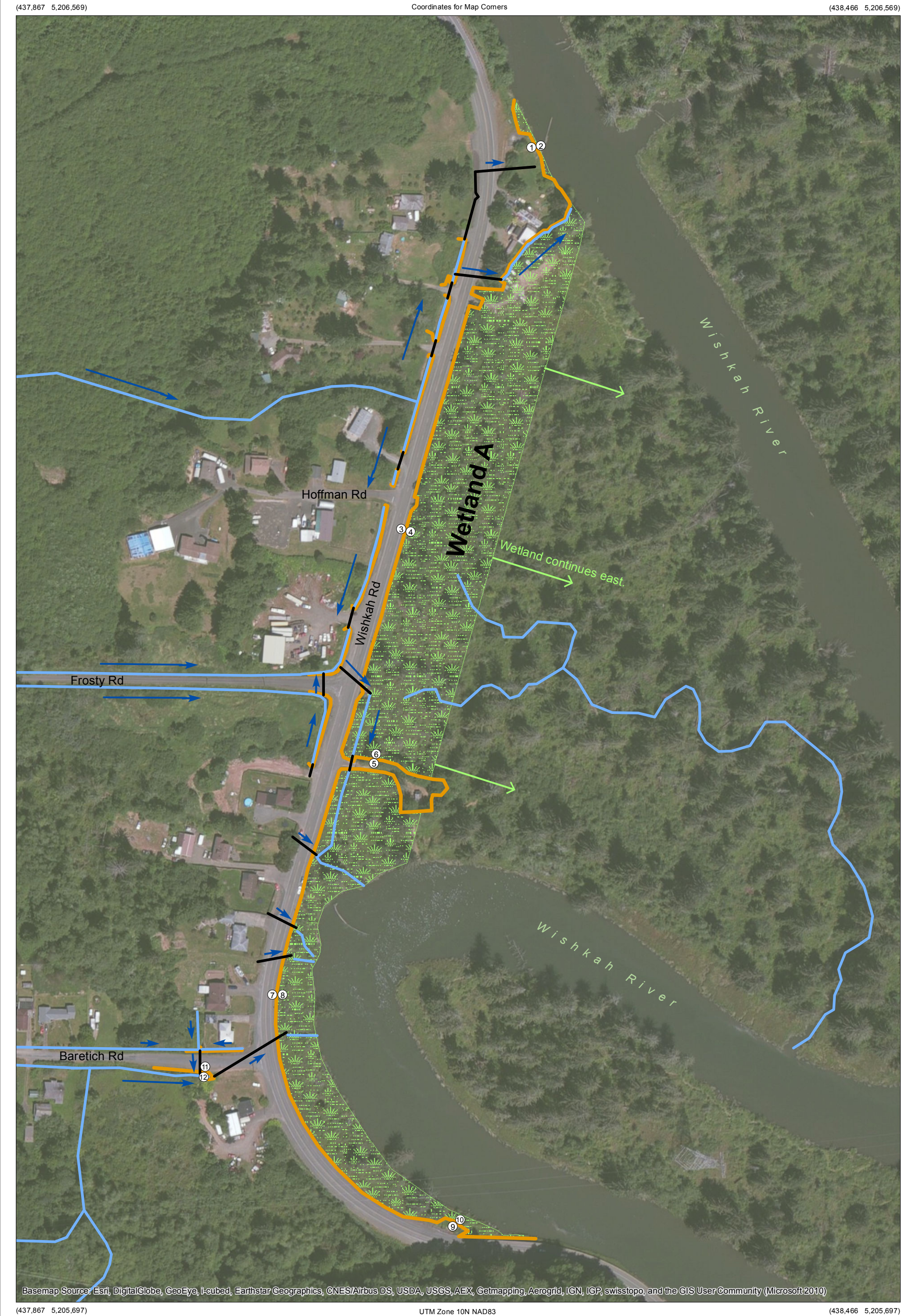
Wishkah Road

3915-17568-A

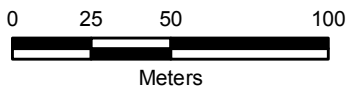


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Date: August 7, 2014



- Culvert
- Drainage/Streams (Approximate)
- Flow Direction
- OHWM Boundary (Survey provided by Berglund, Schmidt & Assoc., Inc.)

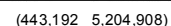
- ① Data Points (Approximate)
- Wetland

Figure 5  
Existing Wetlands and Streams



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(443,192 5,214,433)



**amec**

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(437,723 5,206,770)

Coordinates for Map Corners

(438,821 5,206,770)



(437,723 5,205,524)

UTM Zone 10N NAD83

(438,821 5,205,524)

Date: August 7, 2014



Project Area

#### Wetland Type



Freshwater Forested/  
Shrub Wetland



Riverine

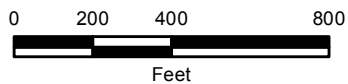


Figure 7

National Wetlands  
Inventory Map

Wishkah Road

3915-17568-A



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## **APPENDIX B**

Wetland Determination Data Forms

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 1 (Flag A7)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): Flats Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Lytell silt loam, 30-65% 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 X, Soil       , or Hydrology        significantly disturbed? Are "Normal Circumstances" present? Yes ☐ No ☒

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sampling point located in residential lawn adjacent to bank of Wishkah River near flag A7. Only 1 of 3 wetland indicators present.	

## VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30 ft.</u> )				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>2</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft.</u> )				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Prevalence Index worksheet:</b> Total % Cover of: <u>      </u> Multiply by: OBL species <u>      </u> x 1 = <u>      </u> FACW species <u>      </u> x 2 = <u>      </u> FAC species <u>      </u> x 3 = <u>      </u> FACU species <u>      </u> x 4 = <u>      </u> UPL species <u>      </u> x 5 = <u>      </u> Column Totals: <u>      </u> (A) <u>      </u> (B)  Prevalence Index = B/A = <u>      </u>
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
<b>Herb Stratum</b> (Plot size: <u>5 ft.</u> )				
1. <u>Poa pratensis</u>	<u>40</u>	<u>Y</u>	<u>FAC</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Lolium perenne</u>	<u>35</u>	<u>Y</u>	<u>FAC</u>	
3. <u>Taraxacum officinale</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. <u>Plantago major</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
11. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
<b>Woody Vine Stratum</b> (Plot size: <u>15 ft.</u> )				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
<b>% Bare Ground in Herb Stratum</b> <u>0</u>				
Remarks: Hydrophytic vegetation indicator present.				

## SOIL

Sampling Point: 1 \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-12	10YR 4/3	90	10YR 5/6	8	C	M	loam	
12-18	10YR 4/2	55	10YR 4/6	10	C	M	loam	
	10YR 4/3	30						

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
--	--

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

Remarks: No hydric soil indicators present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: -

Remarks: No wetland hydrology indicators present.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 2 (Flag A7)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Lytell silt loam, 30-65% 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample point located within a wetland along Wishkah River; all three wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. -	-	-	-	
2. -	-	-	-	
3. -	-	-	-	
4. -	-	-	-	
				- = Total Cover
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>				
1. <u>Rubus spectabilis</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Nootka rose</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
3. -	-	-	-	
4. -	-	-	-	
5. -	-	-	-	
				<u>10</u> = Total Cover
<b>Herb Stratum (Plot size: 5 ft.)</b>				
1. <u>Carex obnupta</u>	<u>50</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Argentina anserina</u>	<u>15</u>	<u>N</u>	<u>OBL</u>	
3. <u>Phalaris arundinacea</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
4. <u>Lysichiton americanus</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
5. <u>Juncus effusus</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
6. -	-	-	-	
7. -	-	-	-	
8. -	-	-	-	
9. -	-	-	-	
10. -	-	-	-	
11. -	-	-	-	
				<u>85</u> = Total Cover
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>				
1. -	-	-	-	
2. -	-	-	-	
				- = Total Cover
<b>% Bare Ground in Herb Stratum</b> <u>15</u>				
Remarks: Hydrophytic vegetation indicator present.				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:	Multiply by:
OBL species <u>      </u>	x 1 = <u>      </u>
FACW species <u>      </u>	x 2 = <u>      </u>
FAC species <u>      </u>	x 3 = <u>      </u>
FACU species <u>      </u>	x 4 = <u>      </u>
UPL species <u>      </u>	x 5 = <u>      </u>
Column Totals: <u>      </u> (A)	<u>      </u> (B)
Prevalence Index = B/A = <u>      </u>	

**Hydrophytic Vegetation Indicators:**  
☐ Rapid Test for Hydrophytic Vegetation  
☒ Dominance Test is >50%  
☐ Prevalence Index is ≤3.0<sup>1</sup>  
☐ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Wetland Non-Vascular Plants<sup>1</sup>  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

## SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-2	10YR 4/3	95	10YR 4/6	2	C	M	silt loam	
2-6	10YR 3/1	95	10YR 4/6	5	C	M	silt loam	
6-16	10YR 4/1	95	10YR 4/6	5	C	M	silt loam	

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Hydric soil indicator F3 is present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0" (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Primary wetland hydrology indicator B3 is present. Soil is also saturated to the surface.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 3 (Flag A41)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): slope (road berm) Local relief (concave, convex, none): none Slope (%): 5-10%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point located on Wishkah Road berm. Only 1 of 3 wetland indicators present.	

## VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>30 ft.</u> )	<u>Absolute % Cover</u>	<u>Dominant Species?</u>	<u>Indicator Status</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
<u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft.</u> )				<b>Prevalence Index worksheet:</b> Total % Cover of: <u>      </u> Multiply by: <u>      </u> OBL species <u>      </u> x 1 = <u>      </u> FACW species <u>      </u> x 2 = <u>      </u> FAC species <u>      </u> x 3 = <u>      </u> FACU species <u>      </u> x 4 = <u>      </u> UPL species <u>      </u> x 5 = <u>      </u> Column Totals: <u>      </u> (A) <u>      </u> (B)  Prevalence Index = B/A = <u>      </u>
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
<u>Herb Stratum</u> (Plot size: <u>5</u> )				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Phalaris arundinacea</u>	<u>50</u>	<u>Y</u>	<u>FACW</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
11. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>50</u> = Total Cover				
<u>Woody Vine Stratum</u> (Plot size: <u>15 ft.</u> )				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
% Bare Ground in Herb Stratum <u>50</u> Remarks: Hydrophytic vegetation indicator present.				

## SOIL

Sampling Point: 3 \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-16	10YR 4/3	95						gravelly

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: No hydric soil indicators present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.



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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 4 (Flag A41)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): toe of slope Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample point located within a wetland; all three wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>30</u>	<u>Y</u>	<u>FAC</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
3. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
4. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>30</u> = Total Cover		<b>Prevalence Index worksheet:</b> Total % Cover of: <u>          </u> Multiply by: OBL species <u>          </u> x 1 = <u>          </u> FACW species <u>          </u> x 2 = <u>          </u> FAC species <u>          </u> x 3 = <u>          </u> FACU species <u>          </u> x 4 = <u>          </u> UPL species <u>          </u> x 5 = <u>          </u> Column Totals: <u>          </u> (A) <u>          </u> (B)  Prevalence Index = B/A = <u>          </u>
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>				
1. <u>Salix sitchensis</u>	<u>65</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Lonicera involucrata</u>	<u>10</u>	<u>N</u>	<u>FAC</u>	
3. <u>Rubus spectabilis</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. <u>Malas fusca</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>85</u> = Total Cover		
<b>Herb Stratum (Plot size: 5 ft.)</b>				
1. <u>Phalaris arundinacea</u>	<u>95</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Vicia americana</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
4. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
5. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
6. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
7. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
8. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
9. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
10. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
11. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>100</u> = Total Cover		
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	
		<u>-</u> = Total Cover		
<b>% Bare Ground in Herb Stratum</b> <u>0</u>				
Remarks: Hydrophytic vegetation indicator present.				

## SOIL

Sampling Point: 4 \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-4	10YR 3/2	95	10YR 4/6	2	C	M/PL	loam	redox features start at 3"
4-16	10YR 3/1	90	10YR 4/6	5	C	PL	loam	
			10YR 4/1	5	D	PL		

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Hydric soil indicator present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 8 _____ Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6 _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Wetland hydrology indicator present.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 5 (Flag A53)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point located in upland on fill placed for driveway to residence. All three wetland indicators are not present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:														
1. <u>Alnus rubra</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)														
2. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	Total Number of Dominant Species Across All Strata: <u>4</u> (B)														
3. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50</u> (A/B)														
4. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
<u>60</u> = Total Cover																		
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>																		
1. <u>Rubus armeniacus</u>	<u>8</u>	<u>Y</u>	<u>FACU</u>	<b>Prevalence Index worksheet:</b> <table style="width: 100%;"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>          </u></td> <td>x 1 = <u>          </u></td> </tr> <tr> <td>FACW species <u>75</u></td> <td>x 2 = <u>150</u></td> </tr> <tr> <td>FAC species <u>65</u></td> <td>x 3 = <u>195</u></td> </tr> <tr> <td>FACU species <u>14</u></td> <td>x 4 = <u>56</u></td> </tr> <tr> <td>UPL species <u>          </u></td> <td>x 5 = <u>          </u></td> </tr> <tr> <td>Column Totals: <u>154</u> (A)</td> <td><u>401</u> (B)</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>          </u>	x 1 = <u>          </u>	FACW species <u>75</u>	x 2 = <u>150</u>	FAC species <u>65</u>	x 3 = <u>195</u>	FACU species <u>14</u>	x 4 = <u>56</u>	UPL species <u>          </u>	x 5 = <u>          </u>	Column Totals: <u>154</u> (A)	<u>401</u> (B)
Total % Cover of:	Multiply by:																	
OBL species <u>          </u>	x 1 = <u>          </u>																	
FACW species <u>75</u>	x 2 = <u>150</u>																	
FAC species <u>65</u>	x 3 = <u>195</u>																	
FACU species <u>14</u>	x 4 = <u>56</u>																	
UPL species <u>          </u>	x 5 = <u>          </u>																	
Column Totals: <u>154</u> (A)	<u>401</u> (B)																	
2. <u>Rubus laciniatus</u>	<u>3</u>	<u>Y</u>	<u>FACU</u>															
3. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
4. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
5. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
<u>11</u> = Total Cover																		
<b>Herb Stratum (Plot size: 5 ft.)</b>																		
1. <u>Phalaris arundinacea</u>	<u>75</u>	<u>Y</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.														
2. <u>Equisetum arvense</u>	<u>5</u>	<u>N</u>	<u>FAC</u>															
3. <u>Rubus ursinus</u>	<u>3</u>	<u>N</u>	<u>FACU</u>															
4. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
5. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
6. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
7. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
8. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
9. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
10. <u>                  </u>	<u>          </u>	<u>          </u>	<u>          </u>															
11. <u>                  </u>	<u>          </u>	<u>          </u>	<u>          </u>															
<u>83</u> = Total Cover																		
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>																		
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>														
2. <u>                    </u>	<u>          </u>	<u>          </u>	<u>          </u>															
<u>-</u> = Total Cover																		
<b>% Bare Ground in Herb Stratum</b> <u>20</u>																		
Remarks: No hydrophytic vegetaiton indicator is present. Prevelance Index does not apply because hydric soil and wetland hydrology indicators are not present.																		

## SOIL

Sampling Point: 5 \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-18	10YR 4/4	95	-	-	-	-	sandy loam	fill for driveway

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: No hydric soil indicators present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 6 (Flag A53)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample point located within a wetland; all three wetland indicators are present.	

## VEGETATION – Use scientific names of plants.

<p><u>Tree Stratum</u> (Plot size: <u>30 ft.</u>)</p> <table style="width: 100%;"> <thead> <tr> <th></th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> </thead> <tbody> <tr><td>1. <u>Picea sitchensis</u></td><td style="text-align: center;">30</td><td style="text-align: center;">Y</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. <u>Alnus rubra</u></td><td style="text-align: center;">30</td><td style="text-align: center;">Y</td><td style="text-align: center;">FAC</td></tr> <tr><td>3. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>4. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;"><u>60</u> = Total Cover</td></tr> </tbody> </table> <p><u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft.</u>)</p> <table style="width: 100%;"> <tbody> <tr><td>1. <u>Lonicera involucrata</u></td><td style="text-align: center;">35</td><td style="text-align: center;">Y</td><td style="text-align: center;">FAC</td></tr> <tr><td>2. <u>Malus fusca</u></td><td style="text-align: center;">15</td><td style="text-align: center;">Y</td><td style="text-align: center;">FACW</td></tr> <tr><td>3. <u>Frangula purshiana</u></td><td style="text-align: center;">5</td><td style="text-align: center;">N</td><td style="text-align: center;">FAC</td></tr> <tr><td>4. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>5. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;"><u>55</u> = Total Cover</td></tr> </tbody> </table> <p><u>Herb Stratum</u> (Plot size: <u>5 ft.</u>)</p> <table style="width: 100%;"> <tbody> <tr><td>1. <u>Phalaris arundinacea</u></td><td style="text-align: center;">70</td><td style="text-align: center;">Y</td><td style="text-align: center;">FACW</td></tr> <tr><td>2. <u>Carex obnupta</u></td><td style="text-align: center;">5</td><td style="text-align: center;">N</td><td style="text-align: center;">OBL</td></tr> <tr><td>3. <u>Equisetum arvense</u></td><td style="text-align: center;">2</td><td style="text-align: center;">N</td><td style="text-align: center;">FAC</td></tr> <tr><td>4. <u>Lysichiton americanus</u></td><td style="text-align: center;">5</td><td style="text-align: center;">N</td><td style="text-align: center;">OBL</td></tr> <tr><td>5. <u>Rubus ursinus</u></td><td style="text-align: center;">5</td><td style="text-align: center;">N</td><td style="text-align: center;">FACU</td></tr> <tr><td>6. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>7. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>8. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>9. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>10. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td>11. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;"><u>87</u> = Total Cover</td></tr> </tbody> </table> <p><u>Woody Vine Stratum</u> (Plot size: <u>15 ft.</u>)</p> <table style="width: 100%;"> <tbody> <tr><td>1. <u>-</u></td><td style="text-align: center;">-</td><td style="text-align: center;">-</td><td style="text-align: center;">-</td></tr> <tr><td>2. <u>                                  </u></td><td></td><td></td><td></td></tr> <tr><td colspan="4" style="text-align: right;"><u>-</u> = Total Cover</td></tr> </tbody> </table> <p>% Bare Ground in Herb Stratum <u>13</u></p>		Absolute % Cover	Dominant Species?	Indicator Status	1. <u>Picea sitchensis</u>	30	Y	FAC	2. <u>Alnus rubra</u>	30	Y	FAC	3. <u>                                  </u>				4. <u>                                  </u>				<u>60</u> = Total Cover				1. <u>Lonicera involucrata</u>	35	Y	FAC	2. <u>Malus fusca</u>	15	Y	FACW	3. <u>Frangula purshiana</u>	5	N	FAC	4. <u>                                  </u>				5. <u>                                  </u>				<u>55</u> = Total Cover				1. <u>Phalaris arundinacea</u>	70	Y	FACW	2. <u>Carex obnupta</u>	5	N	OBL	3. <u>Equisetum arvense</u>	2	N	FAC	4. <u>Lysichiton americanus</u>	5	N	OBL	5. <u>Rubus ursinus</u>	5	N	FACU	6. <u>                                  </u>				7. <u>                                  </u>				8. <u>                                  </u>				9. <u>                                  </u>				10. <u>                                  </u>				11. <u>                                  </u>				<u>87</u> = Total Cover				1. <u>-</u>	-	-	-	2. <u>                                  </u>				<u>-</u> = Total Cover				<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>5</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)</p> <p><b>Prevalence Index worksheet:</b></p> <table style="width: 100%;"> <thead> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> </thead> <tbody> <tr><td>OBL species <u>          </u></td><td>x 1 = <u>          </u></td></tr> <tr><td>FACW species <u>          </u></td><td>x 2 = <u>          </u></td></tr> <tr><td>FAC species <u>          </u></td><td>x 3 = <u>          </u></td></tr> <tr><td>FACU species <u>          </u></td><td>x 4 = <u>          </u></td></tr> <tr><td>UPL species <u>          </u></td><td>x 5 = <u>          </u></td></tr> <tr><td>Column Totals: <u>          </u></td><td>(A) <u>          </u> (B) <u>          </u></td></tr> </tbody> </table> <p style="text-align: center;">Prevalence Index = B/A = <u>          </u></p> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><input type="checkbox"/> Rapid Test for Hydrophytic Vegetation</p> <p><input checked="" type="checkbox"/> Dominance Test is &gt;50%</p> <p><input type="checkbox"/> Prevalence Index is ≤3.0<sup>1</sup></p> <p><input type="checkbox"/> Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)</p> <p><input type="checkbox"/> Wetland Non-Vascular Plants<sup>1</sup></p> <p><input type="checkbox"/> Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <p><b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	Total % Cover of:	Multiply by:	OBL species <u>          </u>	x 1 = <u>          </u>	FACW species <u>          </u>	x 2 = <u>          </u>	FAC species <u>          </u>	x 3 = <u>          </u>	FACU species <u>          </u>	x 4 = <u>          </u>	UPL species <u>          </u>	x 5 = <u>          </u>	Column Totals: <u>          </u>	(A) <u>          </u> (B) <u>          </u>
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Remarks: Hydrophytic vegetation indicator present.																																																																																																																											

## SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-16	10YR 4/2	70	10YR 4/6	25	C	M/PL	clay loam	
			10YR 4/1	5	D	PL		

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Hydric soil indicator present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0 _____ Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 2 _____ Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0 _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Wetland hydrology indicators present.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 7 (Flag A83)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 2-5%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point located in upland on gravel road berm; all three wetland indicators are not present.	

## VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Notes
<b>Tree Stratum</b> (Plot size: <u>30 ft.</u> )				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
	<u>-</u> = Total Cover			
<b>Sapling/Shrub Stratum</b> (Plot size: <u>15 ft.</u> )				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
	<u>-</u> = Total Cover			
<b>Herb Stratum</b> (Plot size: <u>5 ft.</u> )				
1. <u>Alopecurus arundinaceus</u>	<u>25</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Taraxacum officinale</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. <u>Carex obnupta</u>	<u>3</u>	<u>N</u>	<u>OBL</u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
11. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
	<u>48</u> = Total Cover			
<b>Woody Vine Stratum</b> (Plot size: <u>15 ft.</u> )				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
	<u>-</u> = Total Cover			
<b>% Bare Ground in Herb Stratum</b> <u>52</u>				
Remarks: No hydrophytic vegetation indicators present.				

**Dominance Test worksheet:**

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

**Prevalence Index worksheet:**

Total % Cover of:	Multiply by:
OBL species <u>3</u>	x 1 = <u>3</u>
FACW species <u>      </u>	x 2 = <u>      </u>
FAC species <u>25</u>	x 3 = <u>75</u>
FACU species <u>20</u>	x 4 = <u>80</u>
UPL species <u>      </u>	x 5 = <u>      </u>
Column Totals: <u>48</u> (A)	<u>158</u> (B)

Prevalence Index = B/A = 3.3

**Hydrophytic Vegetation Indicators:**

☐ Rapid Test for Hydrophytic Vegetation

☐ Dominance Test is >50%

☐ Prevalence Index is ≤3.0<sup>1</sup>

☐ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Wetland Non-Vascular Plants<sup>1</sup>

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

## SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
-	-	-	-	-	-	-	gravel	No soil sample - on gravel road berm.

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: No soil sample possible; no hydric soil indicators present. Upland sample point is located on a sloped, gravel road berm.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.



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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 8 (Flag A83)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample point is located within a wetland; all three wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>		<u>-</u> = Total Cover		<b>Prevalence Index worksheet:</b> Total % Cover of: <u>      </u> Multiply by: OBL species <u>      </u> x 1 = <u>      </u> FACW species <u>      </u> x 2 = <u>      </u> FAC species <u>      </u> x 3 = <u>      </u> FACU species <u>      </u> x 4 = <u>      </u> UPL species <u>      </u> x 5 = <u>      </u> Column Totals: <u>      </u> (A) <u>      </u> (B)  Prevalence Index = B/A = <u>      </u>
1. <u>Rosa nootkana</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Lonicera involucrata</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>Herb Stratum (Plot size: 5 ft.)</b>		<u>10</u> = Total Cover		<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Carex obnupta</u>	<u>90</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Phalaris arundinacea</u>	<u>4</u>	<u>N</u>	<u>FACW</u>	
3. <u>Rumex obtusifolius</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
4. <u>Argentina anserina</u>	<u>3</u>	<u>N</u>	<u>OBL</u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>		<u>100</u> = Total Cover		
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
% Bare Ground in Herb Stratum <u>0</u>				
Remarks: Hydrophytic vegetation indicator present.				

## SOIL

Sampling Point: 8 \_\_\_\_\_

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%				
0-10	10YR 5/1	92	G1 4/N	8	-	-	clay loam	gleyed clay nodules start at 6"
10	-	-	-	-	-	-	-	water/mud

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)
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**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

**Hydric Soil Present?**    Yes ☒    No ☐

Remarks: Hydric soil indicator present.

## HYDROLOGY

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)			
<input type="checkbox"/> Surface Water (A1) <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>except MLRA 1, 2, 4A, and 4B</b> ) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stressed Plants (D1) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Water-Stained Leaves (B9) ( <b>MLRA 1, 2, 4A, and 4B</b> ) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Raised Ant Mounds (D6) ( <b>LRR A</b> ) <input type="checkbox"/> Frost-Heave Hummocks (D7)					
<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>3</u> Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): <u>0</u> (includes capillary fringe)				<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:							
Remarks: Wetland hydrology indicators present.							

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 9 (Flag A96)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 2-5%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: Sample point located in upland; only 1 of 3 wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
				<u>-</u> = Total Cover
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>				
1. <u>Rubus armeniacus</u>	<u>15</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Rubus spectabilis</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
				<u>20</u> = Total Cover
<b>Herb Stratum (Plot size: <u>      </u>)</b>				
1. <u>Phalaris arundinacea</u>	<u>89</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Hieracium maximum</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
3. <u>Vicia americana</u>	<u>3</u>	<u>N</u>	<u>FAC</u>	
4. <u>Polygonum cuspidatum</u>	<u>3</u>	<u>N</u>	<u>FACU</u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
11. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
				<u>100</u> = Total Cover
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
				<u>-</u> = Total Cover
<b>% Bare Ground in Herb Stratum <u>0</u></b>				
Remarks: Hydrophytic vegetation indicator present.				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:	Multiply by:
OBL species <u>      </u>	x 1 = <u>      </u>
FACW species <u>      </u>	x 2 = <u>      </u>
FAC species <u>      </u>	x 3 = <u>      </u>
FACU species <u>      </u>	x 4 = <u>      </u>
UPL species <u>      </u>	x 5 = <u>      </u>
Column Totals: <u>      </u> (A)	<u>      </u> (B)

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**  
☐ Rapid Test for Hydrophytic Vegetation  
☒ Dominance Test is >50%  
☐ Prevalence Index is ≤3.0<sup>1</sup>  
☐ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Wetland Non-Vascular Plants<sup>1</sup>  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

## SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-16	10YR 4/3	75	-	-	-	-	loam	
	10YR 4/4	25						

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: No hydric soil indicator present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicator present.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 10 (Flag A96)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample point located within a wetland; all three wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A)  Total Number of Dominant Species Across All Strata: <u>4</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>		<u>-</u> = Total Cover		<b>Prevalence Index worksheet:</b> Total % Cover of: <u>      </u> Multiply by: OBL species <u>      </u> x 1 = <u>      </u> FACW species <u>      </u> x 2 = <u>      </u> FAC species <u>      </u> x 3 = <u>      </u> FACU species <u>      </u> x 4 = <u>      </u> UPL species <u>      </u> x 5 = <u>      </u> Column Totals: <u>      </u> (A) <u>      </u> (B)  Prevalence Index = B/A = <u>      </u>
1. <u>Salix sitchensis</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Rubus spectabilis</u>	<u>5</u>	<u>Y</u>	<u>FAC</u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>Herb Stratum (Plot size: 5 ft.)</b>		<u>25</u> = Total Cover		<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Phalaris arundinacea</u>	<u>70</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Carex obnupta</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Rumex obtusifolius</u>	<u>5</u>	<u>N</u>	<u>FAC</u>	
4. <u>Typha latifolia</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
11. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>		<u>100</u> = Total Cover		<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<b>% Bare Ground in Herb Stratum</b> <u>0</u>		<u>-</u> = Total Cover		
Remarks: Hydrophytic vegetation indicator present.				

## SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-6	10YR 4/3	95	-	-	-	-	loam	
3-12	10YR 3/2	92	10YR 4/6	6	C	PL	loam	
			10YR 4/2	2	D	PL		
12-18	10YR 3/2	60	10YR 4/6	8	C	PL/M	loam	
	10YR 4/2	32						

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks: Hydric soil indicator present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Recent tidal inundation. Wetland hydrology indicators present.

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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 11 (Flag K3)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): road berm Local relief (concave, convex, none): none Slope (%): >10%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Remarks: Sample point located in upland on road berm. Only 1 of 3 wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: <u>      </u> Multiply by: OBL species <u>      </u> x 1 = <u>      </u> FACW species <u>      </u> x 2 = <u>      </u> FAC species <u>      </u> x 3 = <u>      </u> FACU species <u>      </u> x 4 = <u>      </u> UPL species <u>      </u> x 5 = <u>      </u> Column Totals: <u>      </u> (A) <u>      </u> (B)  Prevalence Index = B/A = <u>      </u>
Sapling/Shrub Stratum (Plot size: 15 ft.)				
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
3. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
4. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup> <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
5. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
Herb Stratum (Plot size: 5 ft.)				
1. <u>Alopecurus arundinaceus</u>	<u>60</u>	<u>Y</u>	<u>FAC</u>	
2. <u>Carex obnupta</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
3. <u>Polygonum cuspidatum</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
4. <u>Taraxacum officinale</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. <u>Phalaris arundinacea</u>	<u>5</u>	<u>      </u>	<u>      </u>	
6. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
7. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
8. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
9. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
10. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
11. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>80</u> = Total Cover				
Woody Vine Stratum (Plot size: 15 ft.)				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	
2. <u>      </u>	<u>      </u>	<u>      </u>	<u>      </u>	
<u>      </u> = Total Cover				
% Bare Ground in Herb Stratum <u>20</u>				
Remarks: Hydrophytic vegetation indicator present.				

## SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-3	10YR 4/3	95	-	-	-	-	loam	
3								refusal due to gravelly road berm

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) ( <b>except MLRA 1</b> ) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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<b>Restrictive Layer (if present):</b> Type: _____ Depth (inches): _____	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: No hydric soil indicators present.

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Water Table Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ Saturation Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology indicators present.



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

Project/Site: Wishkah Flood Wall Design City/County: Grays Harbor County Sampling Date: 4-30-14  
 Applicant/Owner: Grays Harbor County State: WA Sampling Point: 12 (Flag K3)  
 Investigator(s): Jeff Gray and Tad Schwager Section, Township, Range: S33, T18N, R9 W  
 Landform (hillslope, terrace, etc.): roadside Local relief (concave, convex, none): none Slope (%): 0-2%  
 Subregion (LRR): LRR A Lat: - Long: - Datum: -  
 Soil Map Unit Name: Ocosta silty clay loam 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 <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: Sample point located within a wetland; all three wetland indicators present.	

## VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30 ft.)	Absolute % Cover	Dominant Species?	Indicator Status	
1. -	-	-	-	
2. -	-	-	-	
3. -	-	-	-	
4. -	-	-	-	
				- = Total Cover
<b>Sapling/Shrub Stratum (Plot size: 15 ft.)</b>				
1. <u>Lonicera involucrata</u>	15	Y	FAC	
2. -	-	-	-	
3. -	-	-	-	
4. -	-	-	-	
5. -	-	-	-	
				15 = Total Cover
<b>Herb Stratum (Plot size: 5 ft.)</b>				
1. <u>Carex obnupta</u>	45	Y	OBL	
2. <u>Phalaris arundinacea</u>	40	Y	FACW	
3. <u>Polygonum cuspidatum</u>	10	N	FACU	
4. -	-	-	-	
5. -	-	-	-	
6. -	-	-	-	
7. -	-	-	-	
8. -	-	-	-	
9. -	-	-	-	
10. -	-	-	-	
11. -	-	-	-	
				95 = Total Cover
<b>Woody Vine Stratum (Plot size: 15 ft.)</b>				
1. -	-	-	-	
2. -	-	-	-	
				- = Total Cover
<b>% Bare Ground in Herb Stratum</b> <u>5</u>				
Remarks: Hydrophytic vegetation indicator present.				

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  

Total % Cover of:	Multiply by:
OBL species <u>      </u>	x 1 = <u>      </u>
FACW species <u>      </u>	x 2 = <u>      </u>
FAC species <u>      </u>	x 3 = <u>      </u>
FACU species <u>      </u>	x 4 = <u>      </u>
UPL species <u>      </u>	x 5 = <u>      </u>
Column Totals: <u>      </u> (A)	<u>      </u> (B)

Prevalence Index = B/A =

**Hydrophytic Vegetation Indicators:**  
☐ Rapid Test for Hydrophytic Vegetation  
☒ Dominance Test is >50%  
☐ Prevalence Index is ≤3.0<sup>1</sup>  
☐ Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Wetland Non-Vascular Plants<sup>1</sup>  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)  
<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

## SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc <sup>2</sup>	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>			
0-16	10YR 4/2	85	10YR 3/6	5	C	M	loam	redox features start at 4"
			10YR 4/1	10	D	M		

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

<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)  <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
--	--

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

## HYDROLOGY

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

<b>Field Observations:</b> Surface Water Present?    Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): - _____ Water Table Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 6 _____ Saturation Present?    Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (inches): 0 _____ (includes capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Wetland hydrology indicators present.



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## **APPENDIX C**

Wetland Rating Forms

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Wetland name or number A

**WETLAND RATING FORM - WESTERN WASHINGTON**  
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users  
Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): A Date of site visit: 4-30-14

Rated by: Jeff Gray Trained by Ecology? Yes X No    Date of training: 9-09

SEC: 33 TWSHP: 18 RANGE: 9W Is S/T/R in Appendix D? Yes    No X

Map of wetland unit: Figure    Estimated size 34 ac

**SUMMARY OF RATING**

Category based on FUNCTIONS provided by wetland

I X II    III    IV   

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

Score for Water Quality Functions  
Score for Hydrologic Functions  
Score for Habitat Functions  
TOTAL score for Functions

32  
22  
26  
80

Category based on SPECIAL CHARACTERISTICS of wetland

I X II    Does not Apply   

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

I

**Summary of basic information about the wetland unit**

Wetland Unit Special Characteristics	Wetland Unit Class used for Rating
Estuarine	Depressional
Natural Heritage Wetland	Riverine
Bog	Lake-fringe
Mature Forest	Slope
Old Growth Forest	Flats
Coastal Lagoon	Freshwater Tidal
Interdunal	
None of the above	Check if unit has multiple HGM classes present

Wetland name or number A

**Does the wetland unit being rated meet any of the criteria below?**  
If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

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

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

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

Wetland name or number A

## Classification of Wetland Units in Western Washington

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, 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 (i.e. except during floods)?  
NO - go to 2  
YES - The wetland class is **Tidal Fringe**  
If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? YES - Freshwater Tidal Fringe NO - Saltwater Tidal Fringe (Estuarine)  
If your wetland can be classified as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe it is rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. ).
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 both of the following criteria?  
The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;  
At least 30% of the open water area is deeper than 6.6 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?  
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 <3ft diameter and less than 1 foot deep).  
NO - go to 5  
YES - The wetland class is **Slope**

Wetland name or number A

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 two years.

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

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

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time 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 your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the 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 for rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

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

Wetland name or number **A**

D Depressional and Flats Wetlands		Points
HYDROLOGIC FUNCTIONS - Indicates that the wetland unit functions to reduce flooding and stream degradation		(only score if D3=2)
<b>D 1. Does the wetland unit have the potential to improve water quality?</b> (see p. 38)		
D 1.1 Characteristics of surface water flows out of the wetland: Unit is a depression with no surface water leaving it (no outlet) Unit has an intermittently flowing, OR highly constricted permanently flowing outlet (permanently flowing) points = 3 Unit has an unrestricted, or slightly constricted, surface outlet (permanently flowing) points = 2 Unit is a "flat" depression (Q, 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch (if ditch is not permanently flowing treat unit as "intermittently flowing") points = 1 (if ditch is not permanently flowing treat unit as "intermittently flowing") Provide photo or drawing	points = 3 points = 2 points = 1	Figure
S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (see NRCS definitions) YES points = 4 NO points = 0		
<b>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</b> Figure		
Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5 Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3 Wetland has persistent, ungrazed, vegetation > = 1/10 of area points = 1 Wetland has persistent, ungrazed, vegetation < 1/10 of area points = 0 Map of Cowardin vegetation classes		
<b>D 1.4 Characteristics of seasonal ponding or inundation.</b> Figure		
This is the area of the wetland unit that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 yrs. Area seasonally ponded is > 1/2 total area of wetland points = 4 Area seasonally ponded is > 1/4 total area of wetland points = 2 Area seasonally ponded is < 1/4 total area of wetland points = 0 Map of hydrioperiods		
<b>Total for D 1</b> Add the points in the boxes above		
<b>D 2. Does the wetland unit have the opportunity to improve water quality?</b> (see p. 44)		
Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity. — Grazing in the wetland or within 150 ft. — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 ft of wetland — A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging — Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other YES multiplier is 2 NO multiplier is 1		
<b>TOTAL - Water Quality Functions</b> Multiply the score from D1 by D2 Add score to table on p. 1		

Wetland name or number **A**

D Depressional and Flats Wetlands		Points
HYDROLOGIC FUNCTIONS - Indicates that the wetland unit functions to reduce flooding and stream degradation		(only score if D3=2)
<b>D 3. Does the wetland unit have the potential to reduce flooding and erosion?</b> (see p. 46)		
D 3.1 Characteristics of surface water flows out of the wetland unit: Unit is a depression with no surface water leaving it (no outlet) Unit has an intermittently flowing, OR highly constricted permanently flowing outlet (permanently flowing) points = 4 Unit is a "flat" depression (Q, 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch (if ditch is not permanently flowing treat unit as "intermittently flowing") points = 2 Unit has an unrestricted, or slightly constricted, surface outlet (permanently flowing) points = 1 Unit is a "flat" depression (Q, 7 on key), or in the Flats class, with permanent surface outflow and no obvious natural outlet and/or outlet is a man-made ditch (if ditch is not permanently flowing treat unit as "intermittently flowing") points = 1	points = 4 points = 2 points = 1	Figure
<b>D 3.2 Depth of storage during wet periods</b>		
Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry). Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 The wetland is a "headwater" wetland points = 5 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 Unit is flat (yes to Q, 2 or Q, 7 on key) but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft points = 0		
<b>D 3.3 Contribution of wetland unit to storage in the watershed</b>		
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 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 unit is in the FLATS class points = 5		
<b>Total for D 3</b> Add the points in the boxes above		
<b>D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?</b> (see p. 49)		
Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. Note which of the following indicators of opportunity apply. — Wetland is in a headwater of a river or stream that has flooding problems — Wetland drains to a river or stream that has flooding problems — Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems — Other YES multiplier is 2 NO multiplier is 1		
<b>TOTAL - Hydrologic Functions</b> Multiply the score from D 3 by D 4 Add score to table on p. 1		

Wetland name or number **A**

R Riverine and Freshwater Tidal Fringe Wetlands		Points
WATER QUALITY FUNCTIONS Indicators that wetland functions to improve water quality		(see p. 52)
R	R 1.1 Does the wetland unit have the potential to improve water quality?	Figure <b>8</b>
R	R 1.1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: Depressions cover >3/4 area of wetland points = 8 Depressions cover > 1/2 area of wetland points = 4 If depressions > 1/2 of area of unit draw polygons on aerial photo or map Depressions present but cover < 1/2 area of wetland points = 2 No depressions present points = 0	
R	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): Trees or shrubs > 2/3 the area of the unit points = 8 Trees or shrubs > 1/3 area of the unit points = 6 Ungrazed, herbaceous plants > 2/3 area of unit points = 6 Ungrazed, herbaceous plants > 1/3 area of unit points = 3 Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit points = 0 Aerial photo or map showing polygons of different vegetation types Add the points in the boxes above	Figure <b>8</b>
R	R 2. Does the wetland unit have the opportunity to improve water quality? Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but only single source would qualify as opportunity. — Grazing in the wetland or within 150ft — Untreated stormwater discharges to wetland — Tilled fields or orchards within 150 feet of wetland <input checked="" type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging <input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland — The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality — Other YES multiplier is 2 NO multiplier is 1	Figure <b>16</b> (see p. 53)
R	<b>TOTAL - Water Quality Functions</b> Multiply the score from R 1 by R 2 Add score to table on p. 1	multiplier <b>2</b> <b>32</b>

Wetland name or number **A**





R Riverine and Freshwater Tidal Fringe Wetlands		Points
HYDROLOGIC FUNCTIONS Indicators that wetland functions to reduce flooding and stream erosion		(see p. 54)
R	R 3. Does the wetland unit have the potential to reduce flooding and erosion?	Figure <b>4</b>
R	R 3.1 Characteristics of the overbank storage the unit provides: Estimate the average width of the wetland unit perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit)/(average width of stream between banks). If the ratio is more than 20 points = 9 If the ratio is between 10 - 20 points = 6 If the ratio is 5 - <10 points = 4 If the ratio is 1 - <5 points = 2 If the ratio is < 1 points = 1 Aerial photo or map showing average widths	
R	R 3.2 Characteristics of vegetation that slow down water velocities during floods: Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes): Forest or shrub for >1/3 area OR herbaceous plants > 2/3 area points = 7 Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area points = 4 Vegetation does not meet above criteria points = 0 Aerial photo or map showing polygons of different vegetation types Add the points in the boxes above	Figure <b>7</b>
R	R 4. Does the wetland unit have the opportunity to reduce flooding and erosion? Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Note which of the following conditions apply. <input checked="" type="checkbox"/> There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. — There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding — Other (Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike) YES multiplier is 2 NO multiplier is 1	multiplier <b>2</b>
R	<b>TOTAL - Hydrologic Functions</b> Multiply the score from R 3 by R 4 Add score to table on p. 1	<b>22</b>







Wetland name or number A

**H1.4. Interspersion of habitats (see p. 76)**  
Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

None = 0 points      Low = 1 point      Moderate = 2 points

High = 3 points

NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "high". Use maps of Cowardin vegetation classes

**H1.5. Special Habitat Features (see p. 77)**  
Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

☒ Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).  
☒ Standing snags (diameter at the bottom > 4in.) in the wetland  
☒ Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)  
☒ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)  
☒ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated (structures for egg-laying by amphibians)  
☒ Invasive plants cover less than 25% of the wetland area in each stratum of plants

NOTE: The 20% stated in early printings of the manual on page 78 is an error.

**H1. TOTAL Score - potential for providing habitat**  
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

Wetland name or number  
**A**

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

Wetland name or number  
**A**

<b>H 2.3</b> Near or adjacent to other priority habitats listed by WDFW (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <a href="https://wdfw.wa.gov/hab/phtlist.htm">https://wdfw.wa.gov/hab/phtlist.htm</a> ) Which of the following priority habitats are within 330ft (100m) of the wetland unit? NOTE: the connections do not have to be relatively undisturbed. — <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4 ha (1 acre). — <b>Biodiversity Areas and Corridors:</b> Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report p. 152). — <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock. — <b>Old-growth/Mature forests:</b> (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; 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. — <b>Oregon white Oak:</b> Woodlands 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). <input checked="" type="checkbox"/> <b>Riparian:</b> The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. <input checked="" type="checkbox"/> <b>Wetland Patches:</b> 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). <input checked="" type="checkbox"/> <b>Instream:</b> The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. — <b>Nearshore:</b> 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: pp. 167-169 and glossary in Appendix A). — <b>Caves:</b> 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. — <b>Cliffs:</b> Greater than 7.6 m (25 ft) high and occurring below 5000 ft. — <b>Talus:</b> Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. <input checked="" type="checkbox"/> <b>Snags and Logs:</b> Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has 3 or more priority habitats = 4 points If wetland has 2 priority habitats = 3 points If wetland has 1 priority habitat = 1 point No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	<b>4</b>
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Wetland name or number

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<p><b>H 2.4 Wetland Landscape</b> (choose the one description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile. points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed. points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetlands within ½ mile. points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>		<p>3</p>
<p><b>H 2. TOTAL Score - opportunity for providing habitat</b></p> <p>Add the scores from H2.1, H2.2, H2.3, H2.4</p> <p>TOTAL for H 1 from page 14</p>		<p>11</p>
<p><b>Total Score for Habitat Functions</b> – add the points for H 1, H 2 and record the result on p. 1</p>		<p>26</p>

Wetland name or number

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# **CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

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

Wetland Type	Category
Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.	
<p><b>SC 1.0 Estuarine wetlands</b> (see p. 86)</p> <p>Does the wetland unit meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> <li>— The dominant water regime is tidal,</li> <li>— Vegetated, and</li> <li>— With a salinity greater than 0.5 ppt.</li> </ul> <p>YES = Go to SC 1.1 NO</p>	
<p><b>SC 1.1</b> Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p>YES = Category I NO go to SC 1.2</p>	<p><b>Cat. I</b></p>
<p><b>SC 1.2</b> Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II</p> <ul style="list-style-type: none"> <li>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre.</li> <li>— At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</li> <li>— The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.</li> </ul>	<p><b>Cat. I</b></p> <p><b>Cat. II</b></p> <p><b>Dual rating</b></p> <p><b>I/II</b></p>

Wetland name or number  
A

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

Wetland name or number  
A

<p><b>SC 4.0 Forested Wetlands (see p. 90)</b> Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the 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.</p> <p>— 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/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more.</p> <p>NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.</p> <p><input checked="" type="checkbox"/> Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 - 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); 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.</p> <p>YES = Category I NO ___ not a forested wetland with special characteristics</p>	<p><b>Cat. I</b></p>
<p><b>SC 5.0 Wetlands in Coastal Lagoons (see p. 91)</b> Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p>— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p>— The lagoon in which the wetland is located contains surface water that is saline or brackish (&gt; 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</p> <p>SC 5.1 Does the wetland meet all of the following three conditions?</p> <p>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).</p> <p>— At least 1/4 of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p>— The wetland is larger than 1/10 acre (4350 square feet) YES = Category I NO = Category II</p>	<p><b>Cat. I</b> <b>Cat. II</b></p>

Wetland name or number

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<p><b>SC 6.0 Interdunal Wetlands (see p. 93)</b> Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? YES - go to SC 6.1      NO - not an interdunal wetland for rating <i>If you answer yes you will still need to rate the wetland based on its functions.</i> In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"><li>• Long Beach Peninsula- lands west of SR 103</li><li>• Grayland-Westport- lands west of SR 105</li><li>• Ocean Shores-Copalis- lands west of SR 115 and SR 109</li></ul> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger? YES = Category II      NO - go to SC 6.2 SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? YES = Category III</p>	<p>Cat. II</p> <p>Cat. III</p>
<p><b>Category of wetland based on Special Characteristics</b> <i>Choose the highest rating of wetland (all units) across several categories, and in accordance with p. 2.</i> If you answered NO for all types enter "Not Applicable" on p.1</p>	

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**APPENDIX D**

Photographs

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## APPENDIX D

### STUDY AREA PHOTOGRAPHS Kersh-Wishkah Flood Wall Project Grays Harbor County, Washington



**Photo 1** Photo of wetland edge dominated by reed canarygrass along east side of Wishkah Road on April 28, 2014; view north.



**Photo 2** Photo of tidal channel within Wetland A along the east side of Wishkah Road on April 28, 2014; view south.



## APPENDIX D

### STUDY AREA PHOTOGRAPHS Kersh-Wishkah Flood Wall Project Grays Harbor County, Washington



**Photo 3** Photo of wetland edge along the east side of Wishkah Road near the southern end of the study area on April 28, 2014; view northwest.



**Photo 4** Photo of the OHWM and wetland fringe along the western edge of the Wishkah River at high tide near the northern extent of the study area on April 28, 2014; view north.



## APPENDIX D

### STUDY AREA PHOTOGRAPHS Kersh-Wishkah Flood Wall Project Grays Harbor County, Washington



**Photo 5** Photo of the OOHM and wetland fringe along the western edge of the Wishkah River near the northern extent of the study area at low tide on April 30, 2014; view north.



**Photo 6** Photo of the interior of Wetland A and tidal channel surrounded by a mature forest canopy; view east.



## APPENDIX D

### STUDY AREA PHOTOGRAPHS Kersh-Wishkah Flood Wall Project Grays Harbor County, Washington



**Photo 7** Photo of roadside ditch and shrub wetland located on the west side of Wishkah Road and north of Hoffman Road on April 30, 2014; view north.



**Photo 8** Photo of drainage ditch on the south side of Frosty Road on April 30, 2014; view west.