# KEYS ROAD FLOOD PROTECTION CRITICAL AREAS REPORT

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| CFR | Code of Federal Regulations |
| cfs | cubic feet per second |
| Corps | U.S. Army Corps of Engineers |
| Ecology | Washington State Department of Ecology |
| EPA | U.S. Environmental Protection Agency |
| FAC | facultative |
| FACU | facultative upland |
| FACW | facultative wet |
| FEMA | Federal Emergency Management Agency |
| FR | Federal Register |
| GIS | geographic information system |
| GPS | global positioning system |
| HGM | hydrogeomorphic |
| NRCS | Natural Resources Conservation Service |
| NSD | Natural Systems Design, Inc. |
| OBL | obligate wetland |
| OHWM | ordinary high-water mark |
| PFO1 | palustrine forested deciduous |
| PFOE1 | palustrine forested seasonally flooded/saturated deciduous |
| PHS | Priority Habitat and Species |
| TMDL | Total Maximum Daily Load |
| UPL | upland |
| USFWS | U.S. Fish and Wildlife Service |
| WAC | Washington Administrative Code |
| WDFW | Washington Department of Fish and Wildlife |
| 1987 Manual | U.S. Army Corps of Engineers Wetland Delineation Manual |

# 1.0 INTRODUCTION

Natural Systems Design, Inc. (NSD) has prepared this critical areas report for use by Grays Harbor County (County) in its effort to gain construction permits for the proposed Keys Road Flood Protection Project (proposed project). Construction of flood protection in this reach of the lower Satsop River is being pursued by the County to provide protection of Keys Road and the Port of Grays Harbor's potable water well and to support the floodplain connectivity and restoration efforts Washington Department of Fish and Wildlife (WDFW) is pursuing in the project vicinity.

At the request of the County, NSD characterized critical areas and floodplain conditions in an approximately 23.5-acre study area composed of two parts at River Mile (RM) 1.5 and at RM 0.5 along the eastern side of Keys Road, adjacent to the lower Satsop River near Satsop Washington. Our work specifically centered on characterizing the extent and nature of wetlands, waters, and fish and wildlife habitat conservation areas. NSD field checked and updated (where warranted) the previous wetland determination and delineation work completed by Ecolution staff in March 2015. As part of the delineation update, NSD reviewed the Ecology rating forms and wetland categories for each Ecolution delineated wetland within the delineation study area and prepared an updated rating form and associated graphics for one wetland based on an additional area flagged by NSD. NSD also determined the Ordinary High-Water Mark (OHWM) of the portion of the Satsop River that flows through the delineation study area. This determination was made based on both field indicators and modeled 2-year flows.

This critical areas report documents the extent and nature of wetlands, waters, and associated fish and wildlife habitat conservation areas in the defined delineation study area. This report provides information regarding the hydrogeomorphic characteristics and functions of wetlands that may be affected by the proposed project. This report also summarizes the County's other critical areas defined in Chapter 18.02 of the County code (i.e. critical aquifer recharge areas, frequently flooded areas, and geologically hazardous areas) as applicable to the proposed project.

Ultimately, the jurisdictional determination of the presence and extent of wetlands, streams, and other waters of the United States and associated federal, state and local permitting requirements for impacts in this region are the responsibility of the Seattle District, Regulatory Branch of the U.S. Army Corps of Engineers (Corps), the Washington State Department of Ecology (Ecology), and Grays Harbor County respectively.

In addition to their recently adopted Ordinance No. 448 the *Grays Harbor County Critical Areas Protection Ordinance*, Grays Harbor County also specifically regulates activities within, adjacent to, or likely to affect critical areas consistent with the State Environmental Policy Act (SEPA) and the County's Shoreline Management Program.

# 2.0 PROPOSED PROJECT

## Project Area

The project area is located approximately 1.5 miles north of the confluence of the Satsop River with the Chehalis River, approximately 1.5 miles south of the community of Satsop Washington and within Water Resources Inventory Area (WRIA) 22, the Lower Chehalis Watershed. The project area is specifically located near the center of Section 6 in Township 17N, Range 6W (Appendix A, Figure 1).

The Satsop River and its eroding banks are located along the western edge of the project area. The river flows south with significant meanders at approximately RM 1.5 and 0.5. Four large ponds formed from past mining of the floodplain for gravels in the 1970s-1980s are located between the meanders and surrounded by young floodplain forest. The Port of Grays Harbor's well is located near the center of the RM 0.5 portion of the project area (Appendix A, Figure 2). Keys Road forms the eastern edge of the project area; adjacent land uses east of the road are rural residential and agricultural (primarily pasture).

The project area lies in a unique geomorphic setting which can help explain its active rates of channel migration. The Satsop River leaves its own valley and enters the Chehalis River valley directly downstream from Highway 12. Here, it forms a region of elevated land that surrounds the Satsop River and extends above the Chehalis River floodplain. Bank stratigraphy indicates that the underlying material is highly erodible silt which was likely deposited by floods from both river basins. Because the "confluence ridge" lies within the over-widened Chehalis River Valley1, there are no hillslopes to constrain the river's lateral migration, and thus, the Satsop River moves through the valley with few resistant features.

Topography of the project area is relatively flat with higher cut banks along the western bank of the river outside of the project area and an area of higher elevation sidecast along the northern edge of the ponds. Vegetation is primarily young deciduous forest dominated by red alder (Alnus rubra) with a dense shrub understory of mixed native and invasive species such as giant knotweed (*Fallopia sachalinensis*), Himalayan blackberry (*Rubus armeniacus*), and reed canarygrass (*Phalaris arundinacea*).

## Project Background

Prior to European Settlement, resistance to erosion on the landscape was likely provided by old-growth conifer forests and the stable logjams that they created. Logjams and patches of mature forest would have provided stability to the river channel banks (logjams by deflecting flow, roughening and strengthening banks and trees through their extensive root systems). The mature trees were also a source of the "key pieces" of large wood essential for forming stable logjams (e.g. Abbe and Montgomery 1996, 2003) and creating an important ecosystem function referred to as the 'floodplain large wood cycle' in which stable logjams create stable areas where trees can mature within areas of frequent channel migration.

Today however, the resistance provided by the old-growth forest and stable logjams is no longer present on the landscape and the system is lacking natural material that can provide erosional resistance. The only features

[1] The Chehalis River was one of the main drainage paths of the Puget Lobe of the Cordilleran Ice Sheet at the end of the last ice age. As the ice sheet melted, large quantities of water, ice, and rock were transported through the modern-day Chehalis River Valley into the ocean. During these flood waves, the valley was scoured and widened with forces much greater than the modern-day river can exert. Because of this, the valley is wider than it would have been, had it only been subject to erosion from the river alone. (First discussed in Bretz, J.H. 1913. Glaciation of the Puget Sound Region. *Washington Geological Survey Bulletin* No. 8).

that are resisting lateral migration within the project area are man-made structures, such as roads and revetments. These features do not react dynamically to the river in a manner that slows erosion (such as a tree falling in and forming a stable log jam), rather they act as static features that direct the river.

Channel migration in the project area is driven by lateral migration of meander bends and channel avulsions, or cutoffs. It is these processes that establish the river's "meander belt" where meander bends expand in both directions around a central axis until they are cutoff by a channel avulsion when the slope of the bend gets too low. The lower meander between RM 0.0 and RM 1.0 experienced this expansion/cutoff process between ~1990 until November 2018. Prior to 2006, the meander sequence eroded outward from a central axis in both eastward and westward directions. However, when the eastern portion of the sequence met resistance with riprap protecting the Port's well, the bend between RM 0.2 and RM 0.6 began migrating towards itself from both ends because the stream's energy could no longer move eastward. The bends continued to migrate closer towards each other, until they eventually cutoff in a neck cutoff avulsion at RM 0.4 on November 27, 2018.

The current issues with the river are the result of confining the river and concentrating its power in locations where the river hasn't been in thousands of years. The system is now concentrating stream power resulting in increased erosion rates, loss of riparian vegetation, and loss of aquatic habitat. Since the avulsion, the primary flow path is now to the west, along the avulsion route. The cutoff shifted the central axis of the meander belt towards the west where it is likely to remain until the river expands in both directions and another bend eventually cuts off.

Because of this, both right bank outer bends are likely to migrate into existing farmland. The avulsed channel's proximity to landowner residences and the highly erodible soils have placed homes and valuable farmland in imminent danger. River discharge at the time of the avulsion coincided approximately with a 2-year peak flow recurrence event.

Prior to the avulsion, the river's primary route was through the meander bends which convey flow past the Port of Grays Harbor potable water well and adjacent to Keys Road (Appendix A, Figure 2). Although these meander bends are now secondary flow paths, they are engaged multiple times every year at relatively low flows and are experiencing rapid bank erosion which endangers Keys Road and the Port's well.

## Proposed Project

The goals of the proposed bank stabilization project are to distribute stream power across the floodplain, creating a system with dynamic equilibrium that supports riparian vegetation, aquatic habitat, and a restored historic channel migration zone. To achieve this goal, the proposed project focuses on stabilizing the floodplain, stabilizing river flow paths, and reducing rates of erosion along the lower approximately 2 miles of the Satsop River.

The proposed project will use ecologically sensitive solutions consistent with habitat restoration projects in the basin. Specifically, the proposed project would construct two setback revetment engineered log jams (ELJs) on the floodplain to protect Keys Road (Appendix A, Figure 2); these revetment ELJ's will ultimately create conditions which will allow for the full removal of the rock revetment along the left bank of WDFW's property outside the study area. The proposed project also includes construction of a temporary bypass channel, 7 floodplain roughness ELJs, 17 ELJs in the river, and 320 feet of timber complex unit ELJ along the river bank to further reduce erosion of opposite bank agricultural lands by improving floodplain connectivity and helping distribute stream power across the floodplain and reducing main channel velocities.

The setback revetments will be installed within the floodplain of the Satsop River, but will be installed in-the-dry, and not in-water. Similarly, the floodplain roughness structures will be installed on a gravel bar and are

anticipated to be in-the-dry during installation, and not in-water. The other ELJ structures will be installed in-water. All the structures will be installed using a vibratory pile driver.

Post-project conditions are anticipated to reduce erosion and channel migration rates in the vicinity of the two meanders that currently threaten Keys Road and the Port of Grays Harbor well. Post-project instream conditions are anticipated to include higher quality habitat for aquatic species around the installed ELJ structures. These structures are designed to create habitat by:

- scouring pools;
- sorting sediment for spawning;
- providing velocity refuge; and
- supporting production of allochthonous organic matter in the ELJs which supports benthic macroinvertebrate productivity and thus provides foodweb support to aquatic species.

Once the system is allowed to return to, and distribute its energy across its historic floodplain, a less intensive approach to improve habitat functions and further reduce bank erosion will be more feasible.

# 3.0 METHODS

## Study Area

The study area is composed of two discrete locations, centered along the river's left/east bank at RM 0.5 and at RM 1.5 (Appendix A, Figure 2). The study area includes the northern and southern portions of the study area previously investigated for wetlands by Ecolution in 2015.

The RM 1.5 portion of the study area includes the northern end of a wetland identified by Ecolution as Wetland PFO8 along the western side of Keys Road; the RM 0.5 portion of the study area includes the southern end of a wetland identified by Ecolution (2015) as PFO6 and the northern end of a wetland they identified as PFO2 (Appendix A, Figure 2).

## Delineation of Wetlands and Waters of the U.S.

The NSD field team conducted the delineation of wetlands and waters on August 21, 2019 using one team of wetland biologists. NSD used the wetland delineation data collection methods as outlined in the Corps' *Wetland Delineation Manual* (1987 Manual) (Environmental Laboratory 1987) as updated by the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* [*Regional Supplement*] (Environmental Laboratory 2010) and the 2010 *Field Indicators of Hydric Soils in the United States, Version 7.0* (National Technical Committee for Hydric Soils 2010).

Wetland data were collected based on the *Regional Supplement* (Environmental Laboratory 2010) field data forms. In an effort to update the previous delineation, the teams collected 15 sample plots, generally in wetland and upland pairs, across the project area, as presented in Appendix B, *U.S. Army Corps of Engineers Wetland Determination MVC Data Forms*. In addition to the sample plots, field staff collected supplemental wetland and upland soil samples at various locations in the delineation study area to determine the wetland boundary.

All data were collected during a period of the year typically considered by the NRCS Climate Analysis for Wetlands Tables, also known as the WETS Tables, to be during a 32-degree or higher growing season in Grays Harbor County. The delineation field data were collected during a period of normal to slightly warmer than average temperatures in the portion of August preceding the field work (Table 1) based on August 2019 WETS temperature data from the Aberdeen airport station from 1971 to 2019 (National Resources Conservation Service 2019). The field work was conducted on the day of heaviest precipitation in the month of August, with 0.64 inches of the month's total of 1.31 inches falling during the period of the field work. Precipitation conditions were otherwise typical for August. The field teams generally interpreted the field conditions at the time of delineation to represent normal seasonal precipitation conditions for the typically dry period prior to the delineation, but did recognize that nearly half the average August total precipitation was received during the day of the delineation field work (Table 1).

**Table 1. Precipitation and Temperature Data from WETS Station at Aberdeen Airport**

| TOTALS | ABERDEEN AIRPORT STATION |
|---|---|
| **PRECIPITATION** | |
| Total 7 days Prior to Field Work (August 21, 2019) | 0.0” |
| Total Date of Field Work (August 21, 2019) | 0.64” |
| Total August 2019 | 1.31” |
| Average August (1971 -2018) | 1.58” |
| **TEMPERATURE** | |
| Average 7 days Prior to Field Work (August 14 to 20, 2019) | 64.9° |
| Average on Date of Field Work (August 21, 2019) | 63 ° |
| Average Mean August Temperature (1971-2018) | 61.6° |

## Wetland Delineation Criteria

Under Section 404 of the Clean Water Act, a wetland is defined as an area “inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Federal Register 1986:41251). Under normal circumstances, the 1987 manual and the Regional Supplement (Environmental Laboratory 1987, 2010) require the presence of wetland indicators for hydrophytic vegetation, hydrology, and hydric soils for an area to be considered a wetland.

### Vegetation

Hydrophytic vegetation is defined as “macrophytic plant life growing in water, soil, or substrate that is at least periodically deficient in oxygen as a result of excessive water content” (Environmental Laboratory 1987). The State of Washington 2016 Wetland Plant List (Lichvar et al., 2016) was used in the field to determine the Wetland Indicator Status (WIS) ratings for individual species.

The WIS ratings define plant species based on their ability to withstand saturated soil conditions. Plants are rated, from highest to lowest probability of occurrence in wetlands, as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL), respectively (Lichvar et al., 2012; Table 2).

**Table 2. Plant Species Indicator Category Definitions**

| CATEGORY | DEFINITION |
|---|---|
| Obligate (OBL) | Plants that almost always occur in wetlands (estimated probability > 99%) under natural conditions. |
| Facultative Wetland (FACW) | Plants that usually occur in wetlands (estimated probability 67 to 99%) but are occasionally found in non-wetland areas. |
| Facultative (FAC) | Plants that are equally likely to occur in wetlands or non-wetlands (estimated probability 33 to 67%). |
| Facultative Upland (FACU) | Plants that usually occur in non-wetlands (estimated probability 67 to 99%). |
| Upland (UPL) | Plants that almost always occur in non-wetlands (estimated probability > 99%) under natural conditions. |

Source: Lichvar et al., 2012

Under normal circumstances, the criteria for hydrophytic vegetation are considered met if greater than 50% of the dominant species from each stratum—tree, shrub, vine, and herbaceous—are classified as obligate (OBL), facultative wet (FACW), and/or facultative (FAC), according to the Corps' publication *National List of Plant Species that Occur in Wetlands* (Lichvar et al., 2016), as updated by the annual version of the online National Wetland Plant List species detail tool (U.S. Army Corps of Engineers 2019).

Dominant species were determined by using the 50/20 rule where, dominants are the most abundant species that individually or collectively account for more than 50% of the total coverage of vegetation in the stratum (layer), plus any other species that by itself, accounts for at least 20% of the total, as shown on the data forms (Appendix B). All plant species encountered are listed on the data forms to provide a full picture of the vegetation community. References used to identify plant species included Pojar and MacKinnon 1994, Cooke 1997, and Hitchcock and Cronquist 1976. Cowardin vegetation classes were determined based on the USFWS wetland classification system (Cowardin et al., 1979; Federal Geographic Data Committee 2013).

## Soils

Hydric soils are defined as soils that are saturated, flooded, or ponded for sufficient duration during the growing season to develop anaerobic (i.e., reducing) conditions in the upper horizons, which favor the growth and regeneration of hydrophytic vegetation (Environmental Laboratory 1987, 2010).

Soil map units are classified as hydric based on criteria set forth by the National Technical Committee for Hydric Soils (National Resources Conservation Service 2012). In general, these criteria include the following:

- Soils that are classified as organic mucks and/or peats (i.e., most histels and histosols).
- Map unit components of several mineral soil suborders, great groups, or subgroups that are characterized as somewhat poorly drained, poorly drained, or very poorly drained and exhibit high water tables between 0.5 and 1.5 feet from the soil surface for a significant period (usually a week or more) during the growing season.
- Map unit components that are frequently ponded for a long or very long duration during the growing season.

- Map unit components that are frequently flooded for a long or very long duration during the growing season.

Under these criteria, hydric soils may be further classified as drained or un-drained, with drained hydric soils being those for which sufficient ground or surface water has been removed by an artificial means (e.g., ditching, subsurface drain tile) to such an extent that the area would no longer support hydrophytic vegetation (Environmental Laboratory 1987, 2010). As such, not all areas of hydric soil are considered to be wetlands.

Hydric soils are identified in the field by digging soil pits to a 16- to 20-inch depth and examining the upper soil profile for hydric soil indicators.

A soil was considered hydric if any one of the following general indicators were present and the soil profile met the specific requirements of the hydric soil indicators for the Western Mountains, Valleys, and Coast subregion specified in the *Regional Supplement* (Environmental Laboratory 2010):

- More than 50% organic material in the upper horizon (i.e. organic soil)
- Histic epipedon in mineral soils
- Strong sulfidic odor
- Reduced matrix with sufficient concentration of redoximorphic features
- Gleyed (gray) or depleted matrix soil colors or redoximorphic features (mottles) with low-chroma matrix colors that met any of the specific hydric soil indicators on the delineation data form

Soil texture, matrix color, and presence of redoximorphic features, depleted matrix or gleying along with the specific hydric soil indicator that was met were recorded on the *Regional Supplement* (Environmental Laboratory 2010) field data forms (Appendix B). Soil hue, value, and chroma were determined using the Munsell Soil Color Chart System (Kollmorgen Instruments Corporation 1994). Soil classifications and descriptions are from the NRCS Web Soil Survey and the Grays Harbor County Soil Survey, Washington (Natural Resources Conservation Service, 2019a and 2019b) and were compared with field samples.

## Hydrology

Wetland hydrology is defined as soil inundation or saturation for sufficient duration to develop hydric soils that support vegetation typically adapted for life in periodically anaerobic soil conditions (Environmental Laboratory 1987, 2010). Primary indicators of wetland hydrology include inundation (i.e., standing water), saturation in the upper 12 inches (30 cm) of the soil column, high water table, water marks or lines on adjacent stationary objects (e.g., trees), sediment deposits or drift lines on vegetation, oxidized rhizospheres along living roots, and water-stained leaves, among others. Such indicators should be present for at least 14 consecutive days of the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability). The presence of two or more secondary hydrology indicators also satisfies the Corps criteria for evidence of wetland hydrology: surface drainage patterns, a dry-season water table, shallow aquitard, saturation on aerial photography, geomorphic position, or FAC-neutral test (Environmental Laboratory 2010). Wetland hydrology indicators provide evidence that the site has a continuing wetland hydrologic regime and that hydric soils and hydrophytic vegetation are not relicts of a past hydrologic regime.

Sample plots with positive indicators of hydrophytic vegetation and hydric soils generally also displayed at least two secondary indicators of wetland hydrology—most often geomorphic position and a positive FAC neutral test (Appendix B).

### Determination of Ordinary High-Water Mark

NSD determined the ordinary high-water mark (OHWM) of the Satsop River within the delineation study area by utilizing the modeled extent of inundation at an approximately 2-year flow event (i.e. 26,260 cfs), coupled with interpretation of the 2017 NAIP aerial photo and updated 2019 NSD drone aerial imagery to capture the extent of recent channel migration and bank erosion. We also considered, relative elevations, and our observed field indicators of the ordinary high-water mark OHWM along the left/east bank of the Satsop River within the two portions of the study area.

The field indicators considered (e.g. scour lines, flood debris and deposits, clean cobbles and gravels, significant changes in slope, vegetation community differences, water marks) were consistent with the procedures described in Ecology's manual for delineation of OHWM (Washington State Department of Ecology, 2016). We completed the OHWM field data form (Appendix B) do document our decision process. Stream type was used to determine the riparian buffer required for the Satsop River (a Type S water), per Section 61 of Grays Harbor County Ordinance No. 448.

## Wetland Category, Functions, and Buffer

NSD used the *Washington State Wetland Rating System for Western Washington* (Hruby 2014) to determine wetland category and relative level of wetland functions under existing conditions. Cowardin vegetation classes were determined based on the USFWS wetland classification system (Cowardin et al., 1979). The functional assessment is based on three major groups of functions that wetlands perform: water quality improvement, hydrologic, and wildlife habitat. Each function is given equal importance in setting the category for a wetland. The ratings for each function are divided into "site potential", "landscape potential", and "value." The rating received for each function was used as an indicator of relative level of each function under existing conditions and will be considered during project design in determining potential for wetland enhancement and rehabilitation.

Updated rating forms were completed for wetlands where NSD's field investigation indicated a significant change from the configuration and extent previously delineated by Ecolution in 2015 (Appendix C, Wetland Rating Forms and Figures). Vegetation class was recorded near the sample plot locations and from various vantage points in the field. Number and configuration of hydroperiods was similarly field observed. Field photographs (Appendix D), aerial photos, and information gathered by team members during other field efforts were also used to determine characteristics in areas not specifically accessed during the delineation.

Total points from the wetland rating form were used to determine wetland category and buffer, consistent with Article II, Wetlands, Section 34, part B.2 Rating and Section 36 Wetland Buffers, of Grays Harbor County Ordinance No. 448 repealing and replacing Chapter 18.06 Critical Area Protection Ordinance.

## Fish and Wildlife Habitat Conservation Areas

NSD investigated the study area to characterize the habitats present relative to the potential presence or absence of state priority fish and wildlife species or priority habitats, consistent with the Grays Harbor County regulation of waters of the state as regulated critical areas (i.e. *fish and wildlife habitat conservation areas*), per Article VI, Section 59 of Grays Harbor County Ordinance No. 448. NSD relied on the publicly accessible WDFW Priority Habitat and Species (PHS) database for occurrence of state priority habitats and species (WDFW 2019).

Priority Species include State Endangered, Threatened, Sensitive, and Candidate species, vulnerable animal aggregations (e.g., heron colonies, bat colonies), and vulnerable species of recreational, commercial, or tribal importance. Priority Habitats are habitat types or elements with unique or significant value to a large number of

species. A Priority Habitat may consist of a unique vegetation type (such as riparian or old-growth mature forest), dominant plant species (such as Oregon white oak woodland), or a specific habitat feature (such as snags, logs, cliffs, or caves). Cities and counties use the WDFW PHS List when designating and protecting *Fish and Wildlife Habitat Conservation Areas* as critical areas under the Growth Management Act and Shoreline Management Act.

# Other Critical Areas

## Critical Aquifer Recharge Areas

As defined in Article III, Section 40 of Grays Harbor County Ordinance No. 448, critical aquifer recharge areas are "those areas with geologic and hydrologic conditions that promote rapid infiltration of recharge waters to groundwater aquifers. They are defined as:

- Group A Public Water System Wellhead Protection Areas determined in accordance with the Department of Health's methodologies;
- Group B Public Water System Sanitary Control Areas and Proposed Sanitary Control Areas when required as part of a development proposal;
- Special protection areas designated by the Department of Ecology under Chapter 173-200-090 WAC;
- Sole-source aquifers designated by the U.S. Environmental Protection Agency; and
- Groundwater management areas designated by the Department of Ecology in cooperation with the local government.

NSD directly obtained GIS data from Grays Harbor County and utilized the Washington State Department of Health's source water assessment program to determine the mapped extent of critical aquifer recharge areas within the study area (Washington State Department of Health 2020).

## Frequently Flooded Areas

As defined in Article IV, Section 44 of Grays Harbor County Ordinance No. 448., frequently flooded areas are designated as those areas "identified by the Federal Insurance Administration in the Flood Insurance Study for Grays Harbor County and Incorporated Areas, dated February 3, 2017, and any revisions thereto, with accompanying Flood Insurance Rate Maps (FIRM). NSD directly obtained GIS data from Grays Harbor County that depicted the DFIRM (digital federal insurance rate map) data and utilized the ECY Grays Harbor County 2017 Effective FEMA Flood Hazard Areas online map viewer to determine the extent of flood hazard areas in the study area (Washington State Department of Ecology 2020).

## Geologically Hazardous Areas

As defined in Article V, Section 53 of Grays Harbor County Ordinance No. 448, geologically hazardous areas are those areas susceptible to one or more of the following types of hazards:

- Erosion hazard;
- Landslide hazard;
- Seismic hazard;
- Tsunami hazard; and
- Other geological events, including but not limited to channel migration zones, mass wasting, debris flows, rock falls, and differential settlement.

Over the course of design and analysis of the proposed project, NSD has mapped the channel migration zone of the lower Satsop River. NSD directly obtained GIS data from Grays Harbor County for liquefaction and seismic hazards and utilized the Washington State Department of Natural Resources Washington Geologic Information Portal to determine the extent of landslide and tsunamic hazards mapped within the study area (Washington State Department of Natural Resources 2020).

# 4.0 RESULTS

## Indications Based on Preliminary Data Collection

Prior to conducting field work, NSD biologists conducted a review of existing information to identify wetlands, streams, critical areas, and other site characteristics to help inform the delineation and critical areas assessment process. The potential for waters of the U.S., wetlands, and fish and wildlife habitat conservation areas to be present in the study area was initially determined using the following background materials:

- Aerial photographs viewed with Google Earth Pro and drone imagery of the study area collected by NSD in March 2019
- Ecolution 2015 wetland delineation report, including field determination forms, photos, and wetland rating forms (Ecolution 2015)
- U.S. Geological Survey 7.5-minute series 2017 and 1986 topographic map of South Elma WA available online via USGS National Map Viewer, 2019
- Natural Resources Conservation Service (NRCS) Web Soil Survey, 2019a
- National Hydric Soil List by State: Washington (National Resources Conservation Service [NRCS], 2019b)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory data (U.S. Fish and Wildlife Service 2019).
- Water Quality Assessment for Washington (Washington State Department of Ecology [Ecology], 2019)
- Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) maps accessed online, 2019
- Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species (PHS) 2019 Species Distribution by County list
- Washington Department of Natural Resources (WDNR) Natural Heritage Inventory of rare plants and wetlands of high conservation value (Washington Department of Natural Resources, 2020).

The mapped extent of critical aquifer recharge areas, frequently flooded areas, and geologically hazardous areas was determined using the following materials:

- ECY Grays Harbor County 2017 Effective FEMA Flood Hazard Areas online map viewer (Washington State Department of Ecology 2020)
- Source Water Assessment Program (SWAP) mapping application (Washington State Department of Health 2020)
- Washington Geologic Information Portal (Washington State Department of Natural Resources 2020)
- GIS data received directly from Grays Harbor County (Grays Harbor County 2020)

## Natural Resources Conservation Service Soil Survey

Wetlands frequently occur in areas of mapped hydric soils. However, non-hydric soil series can also contain hydric inclusions that have not previously been mapped (i.e., wetlands can occur in soils not mapped as hydric). The Natural Resources Conservation Service's Web Soil Survey (NRCS, 2019) indicates that the study area overlaps with three soil series: Fordprairie-Eld-Rennie complex, 0-10 percent slopes, Fordprairie-Roundtree complex, 0-10 percent slopes, and Roundtree loam, 0-5 percent slopes (Appendix A, Figure 3). The Fordprairie series was proposed as a result of a NRCS update project. That update was not published and available at the time the Ecolution wetland delineation was completed. Thus, the study area soils are now mapped and described differently than the Chehalis and Humptulips series presented by Ecolution (2015).

- Fordprairie-Eld-Rennie complex, 0-10 percent slopes (map symbol 1226) is mapped as the dominant soil type at the extreme northern extent of the RM 1.5 study area and throughout most of the RM 0.5 study area. The Rennie component comprises approximately 15 percent of this soil complex and is considered a hydric soil (NRCS 2019a and 2019b).
- Fordprairie-Roundtree complex, 0-10 percent slopes (map symbol 1211) is mapped as the dominant soil type throughout the remaining portion of the RM 1.5 study area, as well as most of the remaining floodplain on river left including the area downstream of the RM 0.5 study area. The Roundtree component makes up approximately 20 percent of this complex and is considered a hydric soil (NRCS 2019a and 2019b).
- Roundtree loam, 0-5 percent slopes (map symbol 1210) is mapped in a narrow band near the outlet of the largest gravel pit pond to the river channel. Roundtree loam is considered a hydric soil series (NRCS 2019a and 2019b).
- Riverwash (map symbol 1200) is mapped along most of the current alignment of the river channel.

The Fordprairie-Eld-Rennie complex, 0-10 percent slopes series (map symbol 1226) is a generally loam to silty clay loam soil complex, which has formed in alluvium and are found on floodplains and alluvial terraces. Available water storage potential is high for all components of this complex. The Fordprairie and Eld components are moderately well-drained soils that flood frequently but generally do not pond water. Typically, the upper 15 inches are a dark brown loam (10YR 3/3 to 7.5YR 3/3) over another 15 inches of brown (10YR4/3 to 5/3) loam; depth to water table is typically 20 to 39 inches in the Fordprairie component of this complex.

The Eld component is a loam soil typically found on alluvial terraces and floodplains and is well-drained and is a rare to occasionally flooded soil. The Rennie component is a silty clay loam soil typically found in forested oxbows and 'backswamps' and is a poorly drained, frequently flooded and frequently ponded soil that is typically black (7.5YR 2.5/1). This soil is found in areas that are frequently ponded for long periods between November and May.

Fordprairie-Roundtree complex, 0-10 percent slopes (map symbol 1211) is a loam soil, with the Fordprairie component as previously described. Roundtree loam is a soil formed in depressions and overflow stream channels in alluvium. Roundtree soils are poorly drained, frequently flooded and frequently ponded soil that is typically very dark graying brown (10YR 3/2) with 10-20 percent redoximorphic features. This soil is found in areas that are frequently ponded for long periods between November and April.

The Riverwash map unit consists of nearly level bars of alluvium of recent original adjacent to the river channel. These areas are periodically flooded with increasing river flows and typically supports only a sparse cover of plants (Pringle 1986).

### National Wetland Inventory

The National Wetlands Inventory (U.S. Fish and Wildlife Service, 2019) online mapping program illustrates a now outdated alignment of the Satsop River, a series of ponds, an area of freshwater emergent wetland within the southern extent of the RM 0.5 portion of the study area and a freshwater forested/shrub wetland within the southern extent of the RM 1.5 portion of the study area (Appendix A, Figure 4).

NWI mapping provides an indication of areas which may potentially meet wetland criteria but it is not inclusive of all areas that could meet the criteria for regulated wetlands. Site specific verification is required. Grays Harbor County does not have a County-specific wetland inventory.

### Ecology Water Quality Assessment

Ecology has classified the mainstem of the Chehalis River as a 303(d) listed water for high temperatures. The wetlands of the study area thus lie along a tributary that drains to a 303(d) listed water within a mile. In addition, a TMDL Water Quality Implementation Plan is in place within the Chehalis River watershed for bacteria (Appendix C, Figure C.5).

### Washington Department of Natural Resources Inventory

Review of the WDNR Natural Heritage Program online data mapper indicated that no high conservation value wetlands occur within or near the study area; similarly, the study area's Township/Range/Section (Section 6 in Township 17N, Range 6W) is not listed by the program as containing any Natural Heritage Features (such as federally listed or state sensitive or rare plant species) (Washington Department of Natural Resources 2019).

## Delineated Wetlands and Waters of the U.S.

As inherently transitional features, wetlands change in size and configuration over time in response to a variety of factors. Thus, a delineated boundary may change over time as local and regional precipitation patterns change and the extent of persistent hydrologic and soil saturation conditions increase or decrease over time.

Based on the fieldwork conducted August 21, 2019, NSD concluded that the three wetlands originally delineated by Ecolution in 2015 (Wetlands PFO8, PFO6, and PFO2) are still present within the delineation study area. Wetland names were maintained from those established by Ecolution in 2015. Appendix A, Figure 5 illustrates the location and delineated boundaries, as well as the approximate wetland edge for portions of Wetland PFO2 outside the study area or otherwise not field delineated. Figure 5 also indicates the location of all wetland and upland sample plots collected by NSD.

Wetlands PFO8 and PFO6 are generally consistent in location and extent as delineated by Ecolution (Appendix A, Figure 5). NSD added one flag to the southern end of Wetland PFO6 to delineate the wetland's connection to the Satsop River (Appendix A, Figure 5). NSD found that Wetland PFO2 includes a large northern lobe that extends into the RM 0.5 study area that was not previously delineated by Ecolution.

The specific characteristics of each wetland within the study area are described below and summarized in Table 3 . Appendix B, *U.S. Army Corps of Engineers Wetland Delineation MVC Data Forms*, presents the delineation forms for each sample plot. Appendix C, *Ecology Wetland Rating Forms for Western Washington*, presents an updated Ecology rating form and figures for Wetland PFO2 and the Ecolution rating forms and figures for Wetlands PFO6 and PFO8. Appendix D, *Photographs*, presents selected photographs of wetland conditions and vegetation communities documented during the August 2019 delineation fieldwork.

**Table 3. Characteristics of Wetlands and Waters in the Study Area**

| WETLAND OR WATER | SIZE (ACRES) | HGM CLASS[A] | COWARDIN CLASSES[B] | ECOLOGY WETLAND RATING[C] | ECOLOGY RATING HABITAT SCORE | STANDARD BUFFER [D] | BUFFER WITH PROJECT IMPACT MINIMIZATION MEASURES[E] |
|---|---|---|---|---|---|---|---|
| PFO8 | 1.02 | Riverine | Emergent, Scrub-Shrub, and Forested | Category II (Ecolution) | 8 | 300 feet | 225 feet |
| PFO6 | 6.84 | Riverine | Emergent, Scrub-Shrub, and Forested | Category I (Ecolution/NSD) | 9 | 300 feet | 225 feet |
| PFO2 | 11.37 | Riverine | Emergent, Scrub-Shrub, and Forested | Category II (updated by NSD) | 8 | 300 feet | 225 feet |
| Satsop River | - | River | - | - | - | 150 feet | Not Applicable |

[A] HGM (hydrogeomorphic) class used for the Washington State Wetland Rating System for Western Washington (Hruby 2014). Each wetland in the study area also has a depressional component.

[B] Cowardin Class of wetland within study area based on *Classifications of Wetlands and Deepwater Habitats of the United States* (U.S. Fish and Wildlife Service 1979).

[C] Ecology rating based on the Washington State Wetland Rating System for Western Washington (Hruby 2014).

[D] Buffers reflect adopted 2019 updates to the Grays Harbor County Critical Areas Ordinance, specifically Article II, Wetlands, Section 34, part B.2 Rating and Section 36 Wetland Buffers.

[E] Buffer width assumes project complies with Table 37.2 provisions to minimize impacts; maintenance of a minimum 100-foot vegetated and protected corridor between wetland and other WDFW Priority habitats (e.g. other wetlands, river channel) may also be feasible, but has not been definitely determined at the time this report was prepared.

## Wetland PFO8

The northern extent of Wetland PFO8 is located near the southeastern corner of the RM 1.5 portion of the study area (Appendix A, Figure 5). This 1.02-acre wetland occurs in a linear depression located along the western edge of Keys Road and appears to hold precipitation and seasonally-elevated groundwater, as well as periodically receive and pond flood flows from the Satsop River. The wetland appears to receive flood flows via a shallow topographic swale/seasonal side channel that extends from the left bank of the river to the northern end of the wetland. Wetland PFO8 was originally delineated by Ecolution and does not appear to have changed in extent or configuration since the 2015 delineation was completed. NSD collected sample plots 1 and 3 to characterize the uplands adjacent to the wetland and sample plot 2 to characterize the northern extent of the wetland (Appendix B; Appendix D photos 1 through 4).

Ecolution characterized Wetland PFO8 as a primarily occasionally flooded, riverine wetland with emergent, scrub-shrub and forested vegetation classes (Cowardin et al., 1979) occurring within the RM 1.5 study area (Appendix C).

### Vegetation

Red alder (*Alnus rubra*, FAC) is the dominate tree species documented by NSD in the northern portion of the wetland; shrub-stature Sitka willow (*Salix sitchensis*, FACW), salmonberry (*Rubus spectabilis*, FAC) and red elderberry (*Sambucus racemosa*, FACU) dominate the shrub layer. Invasive reed canarygrass (*Phalaris arundinacea*, FACW) is the dominant emergent species in the northern portion of the wetland; coastal manroot (*Marah oregana*, Not Listed) is also present in this wetland. The presence of greater than 50% of the dominant species rated FAC or wetter meets the Corps' criteria for hydrophytic vegetation at sample plot 2.

## Soil and Hydrology

The wetland is located on soils mapped as Fordprairie-Roundtree complex, 0 to 10 percent slopes (Figure 3). Soils recorded at sample plot 2 had a surface horizon of dark grayish brown (10YR 4/2) fine sandy loam with 20 percent redox to a depth of more than 16 inches (Appendix B). The presence of the depleted dark grayish brown (10YR 4/2) matrix layer of equal to or more than 6 inches thick and starting within 10 inches of the mineral soil surface meets the depleted matrix (F3) indicator.

Sediment and drift deposits were evident in the wetland as primary indicators of wetland hydrology. In addition, the sample plot was located in a geomorphic position (secondary indicator D2) which could pond water and the vegetation community met the FAC-neutral test (secondary indicator D5).

Soils meeting the depleted matrix (F3) indicator meet the Corps' criteria for hydric soil. The presence of two primary and two secondary indicators meet the Corps criteria for indicators of wetland hydrology.

Based on the presence of hydric soils and the presence of primary and secondary indicators of wetland hydrology, this wetland likely maintains soil saturation within the upper 12 inches of the soil profile for the 14 consecutive days of the growing season required to meet the Corps wetland hydrology criteria.

## Adjacent Uplands

Sample plots 1 and 3 were collected to characterize the non-wetland/upland areas surrounding Wetland PFO8 (Appendix B and Appendix D, photos 1, 3, and 4). The adjacent uplands to the north of Wetland PFO8 (sample plot 1) have a similar vegetation community dominated by reed canarygrass with a fringe of Sitka willow, but the soil was a bright dark brown (7.5YR 3/3) fine sandy loam with faint redox present staring at 8 inches below the ground surface, consistent with those described in the 2015 Ecolution delineation. This area was located in a geomorphic position (secondary indicator D2) which could pond water and the vegetation community met the FAC-neutral test (secondary indicator D5). The wetland hydrology criterion was thus met based on two secondary indicators. However, the soils did not meet any of the hydric soil criteria and thus this area did not have positive indicators of all three parameters required for the area to be determined to be wetland.

The forested uplands adjacent to the western edge of Wetland PFO8 were also dominated by red alder trees and a dense understory of invasive giant knotweed (*Reynoutria/Fallopia sachalinensis*, FACU) with bright, faintly mottled 10YR4/3 fine sandy loam soils to a depth of more than 16 inches. Neither the vegetation nor the soils met wetland criteria. This area receives flood flows, as evidenced by the water marks, sediment and drift deposits, but does not appear to hold water for a sufficient duration to create hydric soil conditions or support a hydrophytic plant community.

NSD investigated the northern extent of the narrow topographic depression which supports Wetland PFO8 and the adjacent grazed pasture area north of Wetland PFO8 (Appendix D, Photos 5 through 7). The northern edge of the depression terminates at the steeply eroded bank of the Satsop River and includes an area with evident use by cattle (Appendix D, Photos 8 and 9) which have significantly compacted the soils and altered the vegetation. Significant bank erosion has also recently occurred in this area (Appendix D, Photos 10 and 11) creating conditions where flood flows in the river overtop the banks and convey flow across the landscape and into this depression.

Sample plots 5 and 15 (Appendix B; Appendix D, Photos 5 through 7) characterize the grazed pasture area, which was generally dominated by facultative grasses and fine sandy loam soils with redox, but the soil matrix was a dark yellowish-brown (10YR 3/4 and 4/4) that did not meet any of the indicators for hydric soils and geomorphic position was the only hydrology indicator present.

Sample plots 6 and 7 (Appendix B; Appendix D, Photos 8 and 9) characterize the disturbed northern edge of the depression along the bank of the Satsop River. This area is elevated approximately 6 feet above the thalweg of the river and the accessible portions were fenced to contain cattle. NSD therefore recorded the vegetative condition in the adjacent undisturbed area outside the fence, but had to collect soils data within the cattle disturbed area. Where the cattle are restricted, red alder (*Alnus rubra*, FAC) and Sitka willow (*Salix sitchensis*, FACW) trees dominate a generally hydrophytic vegetation community, with a dense understory of red-osier dogwood (*Cornus sericea*, FACW), Himalayan blackberry (*Rubus armeniacus*, FAC), snowberry (*Symphoricarpos alba*, FACU), and a very sparse understory including coastal manroot (*Marah oregana*, Not Listed) and reed canarygrass (*Phalaris arundinacea*, FACW). Recent bank erosion was evident, as were drift and sediment deposits and drainage patterns which met wetland hydrology indicators. However, soils were decidedly different than those recorded in the other sample plots throughout the study area, being 3/10Y gley clay loam mixed with dark brown (7.5YR 3/3) sand lenses to a depth of more than 16 inches at sample plot 6 and a brown (10YR4/3) fine sandy loam with faint redox at sample plot 7. Both soil profiles also contained bits of charcoal and chunks of buried organic material. Very little surface horizon was present. The soils did not meet any of the hydric soil indicators, with the gley color being outside those considered to meet the gleyed matrix indicators.

NSD interpreted these conditions to indicate that this portion of the floodplain has historically been repeatedly flooded by the river, depositing the fine clays and sand lenses, and now again receives flood flows when the river overtops its eroding banks. The frequency of inundation appears sporadic and of short duration – sufficient to create indicators of possible wetland hydrology, but not of sufficient duration to create decidedly hydric soils.

## Summary of Wetland Functions for Wetland PFO8

Using Ecology's rating system form, Ecolution scored Wetland PFO8 as totaling 22 points (Appendix C) resulting in a rating of Category II, based on its water quality improvement, hydrology, and habitat functions as a riverine wetland. The wetlands habitat points totaled 8, which would give the wetland a standard buffer of 300 feet, or 225 feet if impact minimization measures are incorporated into the project and/or a minimum 100-foot vegetated corridor between wetland and other WDFW Priority habitats (e.g. other wetlands, river channel) is protected as part of the project.

The proposed project will meet all required impact minimization measures and will maintain the existing generally greater than 100-foot vegetated corridor between the wetlands.

### *Water Quality Function*

Wetland PFO8's site potential to improve water quality rated moderate. While more than two-thirds of this wetland supports trees and shrubs which provide structure to slow surface water, and it is characterized by depressions that can hold water, the extent of the depressions is limited to less than half the area of the wetland (Appendix C).

The landscape potential for this wetland to support water quality functions also rated moderate (Appendix C). This component of the rating system considers wetlands in developed areas to have higher potential to improve water quality because their landscape may contain regular inputs of pollutants to the wetlands. While the upstream contributing basin is relatively undeveloped, more than 10 percent of the contributing basin contains tilled fields, pastures, or forests clear cut within the last five years, as well as other pollution sources (e.g. runoff from Keys Road).

The societal value of the water quality improvement provided by this wetland was rated as high, principally due to the wetland location along the lower mile of the Satsop River, a tributary to the 303(d) listed Chehalis River.

The Chehalis River is 303(d) listed/Category 5 for temperature and the entire watershed has a TMDL for bacteria (Appendix C).

#### *Hydrologic Function*

Wetland PFO8's hydrologic potential to reduce flooding and erosion rated moderate because while the wetland has a large proportion of plants that slow water velocities during floods, it is a very narrow wetland relative to the width of the river channel (Appendix C). These factors influence the degree of storage the wetland can provide and its ability to slow the flow of water during flood events.

The landscape potential to support hydrologic functions was also rated moderate based the adjacent river being characterized as downcut and the lack of an upstream dam (Appendix C).

The societal value of the hydrologic functions provided by these wetlands was rated as high, because the sub-basin areas immediately downstream of the wetland experience surface flooding problems that result in damage to human and/or natural resources (e.g., homes, farms, salmon redds).

#### *Habitat Function*

Wetland PFO8's site potential for habitat function rated moderate based on the wetland's multiple vegetation classes (forested, scrub-shrub, and emergent), its two hydroperiods, its plant species richness and interspersion of habitat types, and the presence of special habitat features such as large downed wood, snags, and undercut banks.

The landscape potential for this wetland to provide habitat functions rated high because of the extent of accessible habitat immediately adjacent to the wetland, the extent of undisturbed habitat surrounding the wetland, and the limited presence of high intensity land use (e.g. roads, residential and industrial development) in the 1-kilometer radius area surrounding the wetland (Appendix C).

The societal value of the habitat functions provided by this wetland was rated as high because of its proximity to three WDFW priority habitats (i.e., biodiversity areas/corridors, riparian habitat along the stream, and presence of snags and logs in proximity to the wetland).

### Proposed Wetland and Buffer Impacts

All permanent wetland impacts have been avoided during project design. The proposed project would not result in any temporary impacts to Wetland PFO8.

In order to prevent a loss of critical area functions and values, all temporary impacts to the wetland's buffer (which overlaps with the 150-foot buffer along the Satsop River) would be revegetated with a mixture of native species which occur in the vicinity of the wetland. Details are provided in the project's JARPA and associated construction plans.

## Wetland PFO6

The southern extent of Wetland PFO6 is located near the southeastern corner of the RM 1.5 portion of the study area (Appendix A, Figure 5). This 6.84-acre wetland occurs in a broad depression extending from the edge of the Satsop River to the edge of gravel pit pond/Wetland PEM5 (Appendix A, Figure 5). This wetland appears to periodically receive and pond flood flows from the Satsop River, as well as hold precipitation and seasonally-elevated groundwater. Wetland PFO6 was originally delineated by Ecolution and does not appear to have changed in extent or configuration since the 2015 delineation was completed; NSD added one flag to mark the southern tip of the wetland where it meets the OHWM of the Satsop River and appears to receive periodic flood

flows. NSD collected sample plots 8 and 9 to characterize the southern end of the wetland and the adjacent uplands (Appendix B; Appendix D photos 12 and 13).

Ecolution characterized the southern end of Wetland PFO6 as an occasionally and seasonally flooded, riverine wetland with a scrub-shrub vegetation class (Cowardin et al., 1979) (Appendix C); the northern portion of the wetland also supports an area of saturated forest and an area of emergent vegetation along the edge of the gravel pit pond/Wetland PEM5.

### Vegetation

Red alder (*Alnus rubra*, FAC) and Pacific willow (*Salix lucida*, FACW) are the dominate tree species documented by NSD in the southern portion of the wetland; shrub-stature Pacific willow (*Salix lucida*, FACW), salmonberry (*Rubus spectabilis*, FAC) and red-osier dogwood (*Cornus sericea*, FACW) dominate the shrub layer. Invasive reed canarygrass (*Phalaris arundinacea*, FACW) is the dominant emergent species in the center of the depression, along with bittersweet nightshade (*Solanum dulcamara*, FAC) and western touch-me-not (*Impatiens noli-tangere*, FACW). The presence of greater than 50% of the dominant species rated FAC or wetter meets the Corps' criteria for hydrophytic vegetation at sample plot 8.

### Soil and Hydrology

The wetland is located on soils mapped as Roundtree loam, 0 to 5 percent slopes (Figure 3). Soils recorded at sample plot 8 had a surface horizon of very dark grayish brown (10YR 3/2) fine sandy loam with 10 percent redox to a depth of more than 16 inches (Appendix B). The presence of the very dark grayish brown (10YR 3/2) matrix with more than 5 percent redox extending deeper than 12 inches from the mineral soil surface meets the redox dark surface (F6) indicator.

Drift deposits were evident in the wetland as primary indicators of wetland hydrology. In addition, the sample plot was located in a geomorphic position (secondary indicator D2) which could pond water, drainage patterns were evident (secondary indicator B10), and the vegetation community met the FAC-neutral test (secondary indicator D5).

Soils meeting the redox dark surface (F6) indicator meet the Corps' criteria for hydric soil. The presence of two primary and two secondary indicators meet the Corps criteria for indicators of wetland hydrology.

Based on the presence of hydric soils and the presence of primary and secondary indicators of wetland hydrology, this wetland likely maintains soil saturation within the upper 12 inches of the soil profile for the 14 consecutive days of the growing season required to meet the Corps wetland hydrology criteria.

### Adjacent Uplands

Sample plot 9 was collected to characterize the non-wetland/upland areas surrounding the southern end of Wetland PFO6 (Appendix B; Appendix D, photo 13). The uplands adjacent to the southern end of Wetland PFO6 were dominated by red alder trees, over a shrub layer of salmonberry and snowberry with reed canarygrass and slough sedge (*Carex obnupta*, OBL) dominating the understory, but the soil was a bright brown (10YR 4/3) fine sandy loam without redox to more than 16 inches. No primary or secondary indicators of hydrology were present.

### Summary of Wetland Functions for Wetland PFO6

Using Ecology's rating system form, Ecolution scored Wetland PFO6 as totaling 22 points, but had incorrectly tallied the points for habitat landscape potential; correctly tallied the wetland scores 23 points (Appendix C) resulting in a rating of Category I, based on its water quality improvement, hydrology, and habitat functions as a

riverine wetland. The wetlands habitat points totaled 9, which would give the wetland a standard buffer of 300 feet, or 225 feet if impact minimization measures are incorporated into the project and/or a minimum 100-foot vegetated corridor between wetlands and other WDFW Priority habitats (e.g. other wetlands, river channel) is protected as part of the project.

The proposed project will meet all required impact minimization measures and will maintain the existing generally greater than 100-foot vegetated corridor between the wetlands.

### *Water Quality Function*

Wetland PFO6's site potential to improve water quality rated moderate. While more than two-thirds of this wetland supports trees and shrubs which provide structure to slow surface water, and it is characterized by depressions that can hold water, the extent of the depressions is limited to less than half the area of the wetland (Appendix C).

The landscape potential for this wetland to support water quality functions also rated moderate (Appendix C). This component of the rating system considers wetlands in developed areas to have higher potential to improve water quality because their landscape may contain regular inputs of pollutants to the wetlands. While the upstream contributing basin is relatively undeveloped, more than 10 percent of the contributing basin contains tilled fields, pastures, or forests clear cut within the last five years, as well as other pollution sources (e.g. runoff from Keys Road, waterfowl use of the emergent fringe).

The societal value of the water quality improvement provided by this wetland was rated as high, principally due to the wetland location along the lower mile of the Satsop River, a tributary to the 303(d) listed Chehalis River. The Chehalis River is 303(d) listed/Category 5 for temperature and the entire watershed has a TMDL for bacteria (Appendix C).

### *Hydrologic Function*

Wetland PFO6's hydrologic potential to reduce flooding and erosion rated moderate because while the wetland has a large proportion of plants that slow water velocities during floods, it is a narrow wetland relative to the width of the river channel (Appendix C). These factors influence the degree of storage the wetland can provide and its ability to slow the flow of water during flood events.

The landscape potential to support hydrologic functions was also rated moderate based the adjacent river being characterized as downcut and the lack of an upstream dam (Appendix C).

The societal value of the hydrologic functions provided by these wetlands was rated as high, because the sub-basin areas immediately downstream of the wetland experience surface flooding problems that result in damage to human and/or natural resources (e.g., homes, farms, salmon redds).

### *Habitat Function*

Wetland PFO6's site potential for habitat function rated high based on the wetland's multiple vegetation classes (forested, scrub-shrub, and emergent), its multiple hydroperiods and connection to the Satsop River, its plant species richness and high interspersion of habitat types, and the presence of special habitat features such as large downed wood, snags, undercut banks, and emergent areas suitable for amphibian egg-laying.

The landscape potential for this wetland to provide habitat functions rated high because of the extent of accessible habitat immediately adjacent to the wetland, the extent of undisturbed habitat surrounding the wetland, and the limited presence of high intensity land use (e.g. roads, residential and industrial development) in the 1-kilometer radius area surrounding the wetland (Appendix C).

The societal value of the habitat functions provided by this wetland was rated as high because of its proximity to three WDFW priority habitats (i.e., biodiversity areas/corridors, riparian habitat along the stream, and presence of snags and logs in proximity to the wetland).

### Proposed Wetland and Buffer Impacts

All permanent wetland impacts have been avoided during project design. The proposed project would result in unavoidable, temporary impacts of approximately 0.33 acre to the southern edge of Wetland PFO6 for installation of the RM 0.5 revetment. Construction will result in the temporary loss of deciduous trees, shrubs and ground cover.

In order to prevent a loss of critical area functions and values, all temporarily impacted areas in the wetland and its buffer (which overlaps with the 150-foot buffer along the Satsop River) would be revegetated with a mixture of native wetland species which occur in Wetland PFO6 (i.e. red alder, willow, red osier dogwood, snowberry, salmonberry and slough sedge). Details are provided in the project's JARPA and associated construction plans.

## Wetland PFO2

The northern extent of Wetland PFO2 is located near the southern edge of the RM 0.5 portion of the study area (Appendix A, Figure 5). The portion of this 11.37-acre wetland within the study area occurs in a broad depression extending from the edge of the Satsop River downstream of the Port's well through old channel meander scars; it then expands across the broad floodplain of the river at its confluence with the Chehalis River (Appendix A, Figure 5). The portion of this wetland within the study area appears to periodically receive and pond flood flows from the Satsop River, as well as hold precipitation and seasonally-elevated groundwater. Wetland PFO2 was originally delineated by Ecolution, but their delineation included only a portion of the northern lobe of the wetland. NSD delineated the northern edge of this northern lobe within the study area to where it intersected with the OHMW of the Satsop River and then utilized a LIDAR derived map of elevations to approximate the wetland boundary outside of the study area. NSD collected sample plots 10 and 11 to characterize this northern lobe of the wetland and the adjacent uplands (Appendix B; Appendix D photos 14 through 17).

The NSD delineated northern end of Wetland PFO2 is an occasionally flooded and saturated, riverine wetland with a forested vegetation class (Cowardin et al., 1979) (Appendix C); the southern Ecolution delineated portion of the wetland also supports emergent areas of permanent and seasonal flooding and a saturated scrub-shrub area along the edge of the river.

### Vegetation

Pacific willow (*Salix lucida*, FACW) is the dominate tree species documented by NSD in the northern portion of the wetland; red-osier dogwood (*Cornus sericea*, FACW) dominates the dense shrub layer. Invasive reed canarygrass (*Phalaris arundinacea*, FACW) is the dominant emergent species along the vegetated edges of the depression, along with western touch-me-not (*Impatiens noli-tangere*, FACW) (Appendix D, photo 14). The very center of the northern lobe of the wetland was unvegetated at the time of our site visit. The presence of greater than 50% of the dominant species rated FAC or wetter meets the Corps' criteria for hydrophytic vegetation at sample plot 10.

### Soil and Hydrology

The wetland is located on soils mapped as Fordprairie-Eld-Rennie complex, 0 to 10 percent slopes (Figure 3). Soils recorded at sample plot 10 had a surface horizon of very dark grayish brown (10YR 3/2) fine sandy loam with 10 percent redox to a depth of more than 16 inches (Appendix B). The presence of the very dark grayish

brown (10YR 3/2) matrix with more than 5 percent redox extending deeper than 12 inches from the mineral soil surface meets the redox dark surface (F6) indicator.

Drift and sediment deposits were evident in the wetland as primary indicators of wetland hydrology. In addition, the sample plot was located in a geomorphic position (secondary indicator D2) which could pond water, and the vegetation community met the FAC-neutral test (secondary indicator D5).

Soils meeting the redox dark surface (F6) indicator meet the Corps' criteria for hydric soil. The presence of two primary and two secondary indicators meet the Corps criteria for indicators of wetland hydrology.

Based on the presence of hydric soils and the presence of primary and secondary indicators of wetland hydrology, this wetland likely maintains soil saturation within the upper 12 inches of the soil profile for the 14 consecutive days of the growing season required to meet the Corps wetland hydrology criteria.

## Adjacent Uplands

Sample plot 11 was collected to characterize the non-wetland/upland areas along the northern edge of Wetland PFO2 (Appendix B; Appendix D, photo 15). The uplands adjacent to the southern end of Wetland PFO2 were dominated by Pacific willow trees, over a shrub layer of shrub-stature Sitka willow and salmonberry with reed canarygrass and stinging nettle (*Urtica dioica*, FAC), along with western touch-me-not (*Impatiens noli-tangere*, FACW) dominating the understory, but the soil was a dark brown (10YR 3/3) silt loam without redox to more than 16 inches. No primary or secondary indicators of hydrology were present.

NSD also investigated the reed canarygrass area north of Wetland PFO2 and the area of forest south of the Port's well and found both areas to be upland (Appendix B, sample plots 12 through 14). The reed canarygrass field at sample plots 12 and 13 (Appendix D, photos 18 and 19) has a dark brown (10YR 3/3) silt loam soil without redox to more than 16 inches. Only the secondary indicator of geomorphic position was present. Thus, the criteria for both hydric soils and wetland hydrology were absent.

The forested area south of the Port's well at sample plot 14, while dominated by Pacific willow, red-osier dogwood, and reed canarygrass, displayed dry, dark yellowish brown (10YR 4/4) fine sandy loam soils without redox to more than 16 inches. Only the secondary indicator of geomorphic position was present. Thus, the criteria for both hydric soils and wetland hydrology were absent.

## Summary of Wetland Functions for Wetland PFO2

NSD created an updated Ecology rating system form for Wetland PFO2 to reflect its updated extent and characteristics. NSD rated the wetland as totaling 22 points (Appendix C) resulting in a rating of Category II, based on its water quality improvement, hydrology, and habitat functions as a riverine wetland. The wetlands habitat points totaled 8, which would give the wetland a standard buffer of 300 feet, or 225 feet if impact minimization measures are incorporated into the project and/or a minimum 100-foot vegetated corridor between wetland and other WDFW Priority habitats (e.g. other wetlands, river channel) is protected as part of the project.

The proposed project will meet all required impact minimization measures and will maintain the existing generally greater than 100-foot vegetated corridor between the wetlands.

### *Water Quality Function*

Wetland PFO2's site potential to improve water quality rated moderate. While more than two-thirds of this wetland supports trees and shrubs which provide structure to slow surface water, and it is characterized by

depressions that can hold water, the extent of the depressions is limited to less than half the area of the wetland (Appendix C).

The landscape potential for this wetland to support water quality functions also rated moderate (Appendix C). This component of the rating system considers wetlands in developed areas to have higher potential to improve water quality because their landscape may contain regular inputs of pollutants to the wetlands. While the upstream contributing basin is relatively undeveloped, more than 10 percent of the contributing basin contains tilled fields, pastures, or forests clear cut within the last five years.

The societal value of the water quality improvement provided by this wetland was rated as high, principally due to the wetland location along the lower mile of the Satsop River, a tributary to the 303(d) listed Chehalis River. The Chehalis River is 303(d) listed/Category 5 for temperature and the entire watershed has a TMDL for bacteria (Appendix C).

#### *Hydrologic Function*

Wetland PFO2's hydrologic potential to reduce flooding and erosion rated moderate because while the wetland has a large proportion of plants that slow water velocities during floods, it is a relatively narrow wetland relative to the width of the river channel (Appendix C). These factors influence the degree of storage the wetland can provide and its ability to slow the flow of water during flood events.

The landscape potential to support hydrologic functions was also rated moderate based the adjacent river being characterized as downcut and the lack of an upstream dam (Appendix C).

The societal value of the hydrologic functions provided by these wetlands was rated as high, because the sub-basin areas immediately downstream of the wetland experience surface flooding problems that result in damage to human and/or natural resources (e.g., homes, farms, salmon redds).

#### *Habitat Function*

Wetland PFO2's site potential for habitat function rated high based on the wetland's multiple vegetation classes (forested, scrub-shrub, and emergent), its multiple hydroperiods and connection to the Satsop River, its plant species richness and high interspersion of habitat types, and the presence of special habitat features such as large downed wood, snags, undercut banks, and emergent areas suitable for amphibian egg-laying.

The landscape potential for this wetland to provide habitat functions rated high because of the extent of accessible habitat immediately adjacent to the wetland, the extent of undisturbed habitat surrounding the wetland, and the limited presence of high intensity land use (e.g. roads, residential and industrial development) in the 1-kilometer radius area surrounding the wetland (Appendix C).

The societal value of the habitat functions provided by this wetland was rated as high because of its proximity to three WDFW priority habitats (i.e., instream, riparian habitat along the stream, and presence of snags and logs in proximity to the wetland).

### Proposed Wetland and Buffer Impacts

All permanent wetland impacts have been avoided during project design. The proposed project would not result in any temporary impacts to Wetland PFO2.

In order to prevent a loss of critical area functions and values, all temporary impacts to the wetland's buffer (which overlaps with the 150-foot buffer along the Satsop River) would be revegetated with a mixture of native species which occur in the vicinity of the wetland. Details are provided in the project's JARPA and associated construction plans.

# Delineated Waters of the U.S.

The OHWM of the Satsop River was mapped as depicted in Figure 5 based on the combination of the modeled 2-year flow (26,260 cfs), field indicators such as vegetation, scour, and sediment deposits and the updated aerial imagery of recent bank erosion collected by NSD drone in March 2019. NSD overlaid the OHWM on the aerial imagery and relative elevation map (REM) and adjusted the elevation until it coincided with the elevations observed in the field at the inlets of Wetlands PFO6 and PFO2. Using this method, the OHWM is located at approximately 6-feet relative elevation (i.e. 6 feet above the river's water surface); at the specific cross section location depicted on the Ecology form (Appendix B, OHWM Form), the OHWM is at elevation 20.1 feet NAVD88.

The proposed ELJ's would be constructed within the river and along its banks; excavation per structure type is presented in the project's JARPA and associated construction plans. The proposed ELJ's are expected to have a direct net benefit to the aquatic habitats of the river.

# Fish and Wildlife Habitat Conservation Areas Assessment

## Stream Type and Riparian Habitat Buffers

Per Article VI, Section 57 of Grays Harbor County Ordinance No. 448, streams are considered a water of the state, and thus the Satsop River is regulated by the County as a critical area, specifically as a *Fish and Wildlife Habitat Conservation Area*. Streams and their buffers are classified and rated as riparian stream corridors. Stream category is determined based perennial or intermittent flow and use or potential use by salmonids and stream buffers are determined based on the stream type and measured outward from the OHWM (Article VI, Section 61). Neither the Corps nor Ecology regulates impacts on stream buffers.

The lower Satsop River designated as a Shoreline of the State (i.e. a Type S water) (WAC 173-18-180, Grays Harbor County List), and as such is afforded a 150-foot buffer from OHWM. The environmental designation of the Satsop River is Rural Development in Grays Harbor County's proposed Shoreline Management Plan update. Watershed restoration, fish and wildlife habitat, and fish passage projects are uses allowed within standards stream buffers, per Section 62.C. Similarly, bank stabilization through bioengineered or soft armoring techniques may be permitted within the stream buffer if they will not degrade fish or wildlife habitat conservation area functions or processes on-site or in the surrounding area (Section 62.C).

The proposed project would result in temporary impacts to the vegetation within wetland buffers and within the 150-foot stream buffer for access, staging, and installation of the ELJs and the timber revetments. The area of critical area buffer impact is presented in the project's JARPA and associated construction plans. All temporarily impacted areas will be restored with native trees, shrubs, and herbaceous species. Thus, the proposed ELJ's and revetments are not expected to result in a loss of critical area functions or values.

## Fish and Wildlife Habitat Assessment

### Washington Department of Fish and Wildlife Priority Habitat and Species Inventory

Review of the WDFW Priority Habitat and Species Inventory online data mapper indicated that the general vicinity of the study area at the confluence of the Satsop and Chehalis Rivers supports a variety of priority species and habitats including freshwater emergent, scrub-shrub, and forested wetlands (Washington Department of Fish and Wildlife 2019). Resident coastal cutthroat, dolly varden/bull trout, winter steelhead, summer and fall Chinook, coho, and fall chum are all mapped as utilizing the lower Satsop River adjacent to the study area.

Trumpeter swan, big-brown bat, Yuma myotis, and concentrations of waterfowl are all mapped in a broad swath encompassing the floodplain of the lower Satsop River and the mainstem of the Chehalis River, but no particular species point occurrences are mapped within the study area. The PHS database contains two 1979 occurrences of Olympic mudminnow, a state sensitive species, generally along historic channel alignments of the lower Satsop River, but not within the study area.

Similarly, no areas with which state- or federally-designated endangered or threatened species have a primary association are documented within the study area (Washington Department of Fish and Wildlife 2019). While northern spotted owls, a federally listed endangered species, are documented within the same Township as the study area, their nesting and foraging habitat does not include the types of lowland floodplains and low-elevation deciduous riparian forests that characterize the study area.

## Habitats Present

NSD staff reviewed current plant community composition and wildlife habitats present within the project area during the wetland delineation field work accomplished in August 2019.

### *Wetlands*

Wetland habitats within the study area are primarily deciduous forested wetlands (e.g. Wetlands PFO2, PFO6, and PFO8) as described herein. These wetlands are typically dominated by a mixture of red alder (Alnus rubra), Sitka willow (Salix sitchensis), and Pacific willow (Salix lucida ssp. lasiandra) trees, with a dense understory of native shrubs including salmonberry, (*Rubus spectabilis*), red elderberry (*Sambucus racemosa),* snowberry *(Symphoricarpos albus)* and invasive species including Himalayan blackberry (*Rubus armeniacus)* and giant knotweed (*Reynoutria/Fallopia sachalinensis*). Emergent areas dominated by invasive reed canarygrass (*Phalaris arundinacea)* exist within portions of Wetland PFO 8 and PFO2. Downed logs and trees (both priority habitats) are present within the wetlands of the study area.

### *Riparian Woodland*

The upland areas surrounding the wetlands are generally dominated by native tree species, primarily red alder, interspersed with scattered black cottonwood (*Populus balsamifera ssp. trichocarpa),* and bigleaf maple (*Acer macrophyllum*).

Beneath the tree canopy, the understory is dominated by a shrub community of vine maple (*Acer circinatum*), red-osier dogwood (*Cornus sericea*), salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa),* beaked hazelnut *(Corylus cornuta),* trailing blackberry *(Rubus ursinus),* Nootka rose *(Rosa nutkana),* black gooseberry *(Ribes lacustre),* and snowberry *(Symphoricarpos albus)*. The herbaceous ground layer is dominated by sword fern (*Polystichum munitum*), stinging nettle (*Urtica dioica),* sparse reed canarygrass (*Phalaris arundinacea*), and Oregon man-root (*Marah oregana*). Low elevation areas within the forested wetlands support common touch-me-not (*Impatiens noli-tangere*).

The majority of trees are deciduous. The red alder range in diameter from approximately 4-6 inches diameter at breast height (dbh) to approximately 24 inches dbh. Red alder are early successional, shade-intolerant species that die and form snags and downed logs as the canopy closes and the trees mature. Snags and downed logs are common within the riparian woodland. Most snags are red alder. Conifers are widely scattered within the study area, primarily Douglas-fir (*Pseudotsuga menziesii*) and the occasional Sitka spruce (*Picea sitchensis*).

Much of the understory in the riparian woodland within and adjacent to the RM 1.5 portion of the study area is a near monoculture of giant knotweed (*Reynoutria/Fallopia sachalinensis*). Other common invasive species within the study area include Himalayan blackberry (*Rubus armeniacus)* and reed canarygrass (*Phalaris*

*arundinacea).* These invasive species are present interspersed in the riparian woodland and forested wetlands and along the edge of Keys Road.

## Wildlife Use and Habitat Conditions

During the delineation field work, biologists observed, heard, or saw evidence of the following species within the study area or its immediate vicinity:

- Pacific treefrog (heard),
- Coyote (scat),
- black-capped chickadee (seen),
- downy or hairy woodpecker (sign observed),
- spotted towhee (seen),
- song sparrow (seen),
- Steller's jay (heard),
- American robin (seen),
- American crow (seen), and
- Bewick's wren (seen).

Wildlife habitat conditions vary across the site based on vegetation type and structural conditions (Figure 2, Appendix A). Habitat conditions are better (i.e. more complexity, less disturbance, more sources of food, shelter, and water) within the riparian woodlands and forested wetland portions of the RM 0.5 study area than in the forests and grazed pasture areas within and north of the RM 1.5 portion of the study area.

Within the woodlands, forested wetlands, and along the banks of the river near the RM 0.5 portion of the study area, the abundance of standing snags, downed wood, and a thick native shrub layer, beneath a largely deciduous forest canopy and near a year-round water source offers good habitat for a variety of mammal, bird, amphibian, reptile, and invertebrate species adapted to rural/sparsely developed areas. Summer air, soil, and stream temperatures are moderated by both the tree canopy and near-ground cover (provided by downed logs and vegetation over-hanging the stream) creating areas of thermal refugia particularly important for invertebrates and amphibians.

Bird nesting sites, including ground surface, tree limb, tree cavity, and shrub-located sites are present throughout the woodland and forested wetland areas within both portions of the study area and along the shoreline of the river. Cool and moist soil conditions, a humus layer, and a location near a water source (i.e. the floodplain ponds between the two portions of the study area) and in areas where downed wood and dense vegetation are prevalent are prime conditions for riparian-associated reptiles and amphibians such as various species of garter snake, Western toad, long-toed salamander, Northwestern salamander, Pacific treefrog, Northern red-legged frog, and roughskin newt.

Decaying wood, a humus layer, and the complexity of a structurally-diverse regenerating woodland also offers good habitat for a variety of invertebrates and supports foraging by species such as spotted towhee, northern flicker, red-breasted sapsucker, and various woodpeckers, including potentially the pileated woodpecker, a state Candidate species. Scattered live and decaying snags with evidence of woodpecker and red-breasted sapsucker workings were observed in the forested portions of the study area.

Small, disturbance-adapted mammals likely find denning and/or foraging habitat in the riparian forests of the site and likely use the edge habitat created at the interface of the forested areas and the agricultural areas (Knutson and Naef 1997). Such species include coyote, bobcat, black bear, opossum, raccoon, various weasels/mink, and black-tail deer. Great blue herons (a state priority species) is commonly observed foraging in open field and forest edges, particularly in wet meadows and emergent wetland areas. Beaver, muskrat, and river otter are typically present in and along the riparian edge and shoreline habitats along rivers (Knutson and Naef 1997). Various bats, including the big-brown bat and Yuma myotis, may similarly find appropriate roosting and foraging habitat in the riparian forests of the study area.

In contrast, the simplified plant community in forested areas dominated by giant knotweed (e.g. the floodplain area north of Wetland PFO8) limits habitat diversity and complexity and likely thus limits wildlife function. Similarly, the open nature and regular disturbance by livestock of the grazed pasture areas within and north of the RM 1.5 portion of the study area are factors that would limit use by wildlife. Similarly, the periodic disturbance by humans at the Port's well site and the fragmentation of habitat at Keys Road also limit use by wildlife.

## Critical Aquifer Recharge Areas

The project area is within the Washington Department of Health's designated Satsop Business Park surface water protection area (Washington Department of Health 2020).

Per Article III, Section 40 of Grays Harbor County Ordinance No. 448, critical aquifer recharge areas (CARA) are a designated critical area to protect the public health and safety, prevent the degradation of ground water aquifers used for potable water, and to provide for regulations that prevent and control risks to the degradation of ground water aquifers in Grays Harbor County.

Aquifer recharge areas are those areas with geologic and hydrologic conditions that promote rapid infiltration of recharge waters to groundwater aquifers. The entire RM 0.5 study area lies within the Group A wellhead protection area/CARA mapped surrounding the Port of Grays Harbor well; a Group B public water system sanitary control area/CARA is mapped within the pre-avulsion river channel, just downstream of the temporary relief channel (Grays Harbor County 2020) (Appendix A, Figures 2 and 6).

The proposed project does not include any of the following types of new development that are not permitted within designated CARAs:

1. Solid waste landfills;
2. Septage application;
3. Underground storage of heating oil in excess of 1,100 gallons for consumptive use on the parcel where stored;
4. Creosote manufacturing or treatment;
5. Chemical manufacture or reprocessing of any extremely hazardous waste as defined by RCW 70.105.010(6) and listed in Chapter 173-303 WAC;
6. Mining of any type below the water table;
7. Processing, storage, and disposal of radioactive substances;
8. Dry cleaning;

9. Auto wrecking facilities;
10. Hazardous waste transfer and treatment; and
11. Hydrocarbon extraction.

## Frequently Flooded Areas

Per Article IV, Section 44 of Grays Harbor County Ordinance No. 448, frequently flooded areas are defined as those areas "identified by the Federal Insurance Administration in the Flood Insurance Study for Grays Harbor County and Incorporated Areas, dated February 3, 2017, and any revisions thereto, with accompanying Flood Insurance Rate Maps (FIRM).

The entire study area is mapped as 100-year floodplain (i.e. Flood Zone A) per the FEMA FIRM, but the study area is not within the FEMA floodway (Grays Harbor County 2020) (Appendix A, Figure 7). The floodway is mapped north and east of US 12.

The County's provisions for flood damage reduction (Article IV, Section 48 of Grays Harbor County Ordinance No. 448) require that all development proposals are consistent with the need to minimize flood damage.

A floodplain impacts assessment is being prepared by NSD for the proposed project to evaluate the effect of the proposed project on 100-year water surface elevations and flood conveyance.

## Geologically Hazardous Areas

The entire study area is mapped as Moderate to High liquefaction potential, with a National Earthquake Hazards Reduction Program (NEHRP) Site Class of 'stiff soil to soft soil' (Grays Harbor County 2020) (Appendix A, Figures 8 and 9). No landslide hazards are mapped along the lower Satsop River, but the study area is within the mapped extent of tsunami hazard areas (Washington State Department of Natural Resources 2020).

The proposed flood protection project contains no elements which could impact the liquefaction, earthquake or tsunami hazard potential of the project area.

# 5.0 REGULATORY CONSIDERATIONS

Several federal, state, and local regulations affect activities in wetlands and streams and their buffers. Agencies that have jurisdiction over activities in wetlands and streams within Grays Harbor County include the following:

- U.S. Army Corps of Engineers (Section 404 of the Clean Water Act),
- Washington State Department of Ecology (Section 401 of the Clean Water Act),
- Washington Department of Fish and Wildlife (Hydraulic Project Approval), and
- Grays Harbor County updated Critical Areas Ordinance (CAO) No. 448

This section provides the City with information related to permitting requirements, should the proposed project require unavoidable impacts on wetlands or waters of the U.S.

## Federal Regulations

The Corps administers Section 404 of the Clean Water Act, which regulates the discharge of dredged or fill materials into waters of the U.S. For projects requiring Section 404 permits, the Corps makes the final determination as to whether the area meets the definition of a federally jurisdictional feature.

Two types of permits, individual and general, are issued by the Corps to authorize activities that would result in the discharge of dredge or fill material into waters of the U.S., including wetlands. Individual permits are required for specific activities that require compliance with the Corps' formal review process. General permits are issued for certain projects that would cause only minimal adverse environmental effects. Nationwide permits (NWP) are a type of general permit that have a set of national and regional conditions that must be met before the permit can be issued. Permit notification requirements and regional conditions are dependent on the specific activity.

NWP 13 (Bank Stabilization), potentially in combination with NWP 27 (Aquatic Habitat Restoration, Enhancement, and Establishment Activities), may be an authorization pathway applicable to the proposed project's installation of ELJs in the river and the timber revetment buried the outer edge of Wetland PFO-6. Per NWP 13, for new bank stabilization projects, the discharge may not exceed 500 feet in length or an average of one cubic yard per running foot, as measured along the length of the treated bank, below the plane of the ordinary high water mark, unless the District Engineer waives this criterion by making a written determination concluding that the discharge will result in no more than minimal adverse environmental effects.

The Corps can authorize activities associated with restoration, enhancement, and establishment of waters and wetlands under NWP 27 "provided those activities result in net increases in aquatic resource functions and services". It is possible that the aquatic benefits inherent to ELJ's may fit within NWP 27. Conversion of a stream or wetland to another habitat type or to upland (e.g. conversion of a wetland to a stream channel) cannot be authorized under NWP 27. However, NWP 27 authorization can include relocation of streams and/or wetlands within the project site *provided* there is a *net increase* in aquatic resource functions and services.

### Recent Changes in Federal Regulation of Jurisdictional Features

NSD's field investigation occurred during a period of time in which traditional navigable waters, tributaries, abutting and adjacent wetlands, and wetlands with a 'significant nexus' to any of those features were typically regulated by the Corps under the Clean Water Act as jurisdictional features.

Areas with evidence of 'relatively permanent flow' (e.g. ditches) were also considered potentially regulated features.

NSD's field investigation thus focused on identification of the OHWM of the lower Satsop River; connected and adjacent wetlands, wetlands connected to another water by a continuum of groundwater, hydric soils, and/or other mechanisms of 'nexus', and areas with evidence of 'relatively permanent flow' and conveyance of water directly to or from a wetland (i.e. ditches).

Areas with evidence of 'relatively permanent flow' (e.g. ditches) have been, until very recently, regulated by the Corps, based on consideration of some or all of the following criteria demonstrating they have a direct and significant connection to another regulated water of the United States:

- The presence of a defined bed and bank.
- The presence of an OHWM or scour mark.
- Evidence of flow or, in some cases, standing water (although standing water may indicate infiltration).
- Hydraulic or hydrologic connection to jurisdictional features, such as wetlands or streams.

President Trump signed Executive Order 13778 on February 28, 2017 directing EPA and the Corps to review the Clean Water Act and the Obama-era proposed Clean Water Rule and begin the process for reinterpreting the definition of Waters of the U.S. On January 23, 2020 (after the field delineation was completed but during preparation of this report), significant changes to the definition of Waters of the U.S. were enacted via adoption of the *Navigable Waters Protection Rule*. These changes will be effective after 60-days public notice from January 23, 2020. The changes appear to be such that many ditches (and many wetlands) may no longer be regulated by the Corps.

At the time of the field delineation, NSD determined that the study area supports Waters of the U.S. in the form of the lower Satsop River (a tributary to the Chehalis River), adjacent wetlands that abut the Satsop River (e.g. Wetland PFO2 and PFO6 within the study area), and wetlands that have significant nexus to these features via surface and/or groundwater connection. We found that the study area generally does not appear to contain roadside ditches with relatively permanent flow.

The Seattle District of the Corps of Engineers may make a determination of whether all wetlands within the study area meet the new definition of Waters of the U.S. during the proposed project's regulatory compliance process.

It should be noted that the Washington State Department of Ecology also regulates wetlands in Washington via the State's Water Pollution Control Act, which has not changed. As such, Ecology may regulate more or different wetlands than may now be regulated at the federal level.

## State Regulations

Section 401 of the Clean Water Act requires applicants for Section 404 permits to obtain Section 401 Water Quality Certification from the certifying agency. In the state of Washington, that agency is Ecology. Section 401 certification ensures that projects discharging to waters of the U.S., including wetlands, meet state water quality standards. The Corps 404 permit is not valid until the 401 certification is issued or waived by Ecology. Conditions of the 401 certification become conditions of the Corps 404 permit.

Wetlands not regulated by the Corps under the Clean Water Act may still be regulated by Ecology (and local jurisdictions) under the state Water Pollution Control Act and the Shoreline Management Act. Ecology can also use the State Environmental Policy Act (SEPA) to identify potential wetland related

concerns during a project's permitting process. Project information should be submitted to Ecology (as well as to the Corps) for Section 404 and 401 verification and approval.

Projects in or near state waters, and particularly those that will "use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state" (RCW 77.55.011(11)) require a Hydraulic Project Approval (HPA) from the Washington Department of Fish and Wildlife (WDFW). This permit would be required for the proposed stream channel restoration work. WDFW uses an online Aquatic Protection Permitting System (APPS) as the mechanism for permit application and offers review and technical assistance through the local area habitat biologist. The same application information prepared for the Corps and Ecology can typically be uploaded to the APPS system. WDFW has 45 days from receipt of a complete application to issue or deny an HPA. A project's SEPA process must be complete before WDFW can issue the project an HPA.

## Federal and State Permit Application Process

Section 404 and 401 permits and the HPA require the submittal of a Joint Aquatic Resources Permit Application (JARPA) to the above-mentioned agencies for approval before initiating any activities in wetlands or streams. A wetland delineation report is typically included as an attachment to the JARPA. Depending on the proposed activity, a mitigation plan demonstrating proper mitigation sequencing and compensation for unavoidable permanent impacts on waters of the U.S. is typically requested by the Corps, Ecology, and the local jurisdiction as part of the JARPA submittal. Mitigation plans, including provisions for long-term monitoring, maintenance, and site protection must be approved by Ecology and the Corps as part of the Section 401 and 404 permitting process for projects the Corps determines require compensatory mitigation.

In addition, demonstrated compliance with Section 7 of the Endangered Species Act is required through the preparation of a No Effect Letter, Biological Assessment, Abbreviated BE form, or Specific Project Information Form [SPIF] if the project meets the requirements of programmatic Endangered Species Act consultations between the Corps, USFWS, and NMFS for specific types of restoration actions. Similarly, demonstrated compliance with Section 106 of the National Historic Preservation Act (NHPA) through preparation of a cultural resources survey report is also required as part of the Section 404 permitting process. Compliance with these two acts is required as part of the Corps permitting process; the Corps will not issue Section 404 authorization until both the ESA and NHPA compliance process is completed. Typically, the Corps and Ecology will consult with local Native American Tribes regarding their usual and accustomed harvest areas and/or fish, wildlife, and/or cultural resources which may be affected by a project seeking federal and/or state permits. That process is typically initiated by the regulatory agencies through the CWA 404, 401, or SEPA process.

Completing the Section 404/401 process can take anywhere from 3 to 4 months to upwards of 12 or more months depending on the type of permit issued, the quality of the resource to be affected, the complexity of the proposed project, the interests of the public and key stakeholders (such as Tribes), and the adequacy and complexity of any proposed mitigation.

## Restoration of Temporary Impacts

Permanent direct and indirect impacts to wetlands and waters of the U.S. are typically considered during a project's regulatory permitting process, as are temporary impacts. Compensatory mitigation may be required to ensure no net loss of area or function as a result of *permanent* project impacts; restoration of *temporarily* impacted wetlands is also typically required via restoration of disturbed soils and plant communities. Monitoring to ensure successful restoration or mitigation is typically required.

The proposed project would result in temporary impacts of approximately 0.37 acre to the southern edge of Wetland PFO6 from construction of the timber revetment, resulting in the temporary loss of deciduous trees, shrubs and ground cover. In order to prevent a loss of critical area functions and values, all temporarily impacted area would be revegetated with a mixture of native wetland species which occur in Wetland PFO6 (i.e. red alder, willow, red osier dogwood, snowberry, salmonberry and slough sedge. Details are provided in the project's JARPA and associated construction plans.

## Mitigation for Permanent Impacts

Permanent impacts to wetlands have been completely avoided during project design. Thus, no permanent impacts to wetlands are anticipated as a result of the proposed project and no compensatory mitigation is proposed.

# 6.0 LIMITATIONS

We have prepared this report for the exclusive use of Grays Harbor County relative to the Keys Road Flood Protection Project. No other person or agency may rely upon the information, analysis, or conclusions contained herein without permission from the County.

The determination of ecological system boundaries, classifications, functions, and values is an inexact science, and different individuals and agencies may reach different conclusions. With regard to wetlands, the final determination of their boundaries for regulatory purposes is the responsibility of the various resource agencies that regulate development activities in and near wetlands. We cannot guarantee the outcome of such agency determinations. Therefore, the conclusions of this report should be reviewed by the appropriate regulatory agencies prior to any detailed site planning or construction activities. Wetlands are by definition transitional areas and their boundaries may change with time. We therefore recommend that the findings in this report be verified by the appropriate regulatory agency as soon as is practical.

Within the limits of schedule, budget, and scope of work, we warrant that the work was performed in accordance with generally accepted practices in our field, and prepared substantially in accordance with technical guidelines and criteria in effect at the time this study was performed. The results and conclusions of this report represent the results of the author's best professional judgment based on the information provided by the project proponent and their consultants, together with information gathered in the course of the study. No other warranty, expressed or implied, is made.

# 7.0 PROFESSIONAL QUALIFICATIONS

This wetland report was prepared by Torrey Luiting, PWS #2734 of NSD, a senior wetland biologist with over 20 years of professional experience delineating wetlands in Washington and preparing wetland delineation, functional assessment, wetland mitigation plans, and performance monitoring reports. Ms. Luiting has delineated wetlands since 1998 and has completed numerous professional training courses related to wetland soils, wetland mitigation planning, and wetland functional assessment. Prior to joining NSD, Ms. Luiting worked for 12 years conducting wetland delineations and preparing wetland reports and related permitting documents for ICF and worked for nearly 3 years completing regulatory compliance documents for the Seattle District, Corps Environmental Resources Section (now Environmental and Cultural Resources Branch). She also completed a detail in the Seattle District Corps' Regulatory Branch reviewing Clean Water Act Section 404 and Section 10 permit applications. Ms. Luiting worked for 6 years as a wetland delineator for a private consulting company prior to joining the Corps.

John Soden, PWS #2475, and Torrey Luiting were the lead wetland biologists completing the field investigations detailed in this report. Mr. Soden completed quality assurance review of this document. Support staff included Aaron Lee, EIT of NSD who assisted in the field investigation and survey and Colin Riordan who completed the geographic information system (GIS) analysis for the wetland rating figures. Information regarding the goals and objectives of the proposed project elements was vetted by NSD project manager, Miranda Smith, PE.

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# Appendix A - Figures

Natural Systems Design

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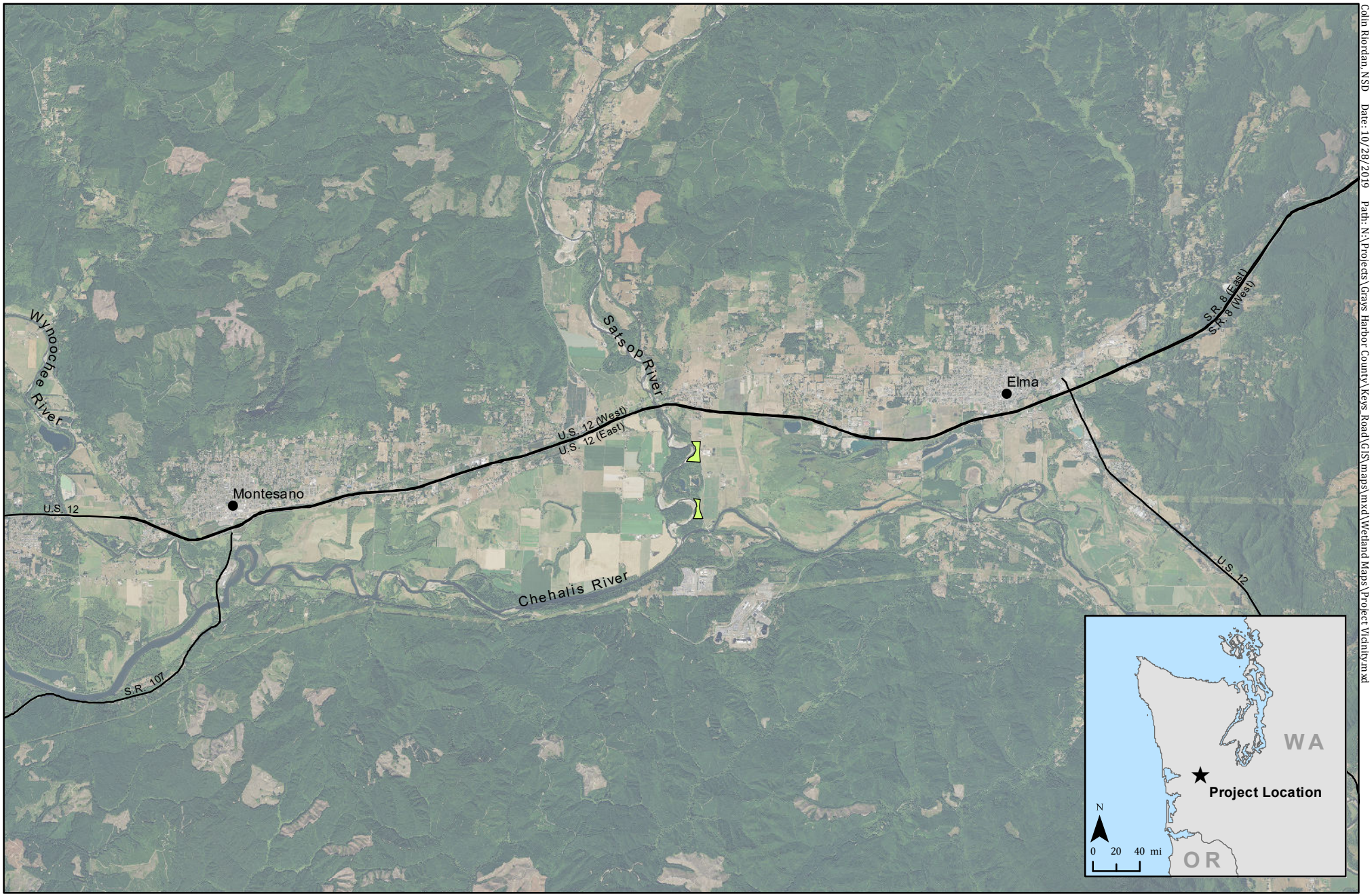



Keys Road Flood Protection

**Figure 1. Project Vicinity**

Aerial Imagery: 2017 USDA NAIP
Rivers: National Hydrography Dataset
Roads: Grays Harbor County

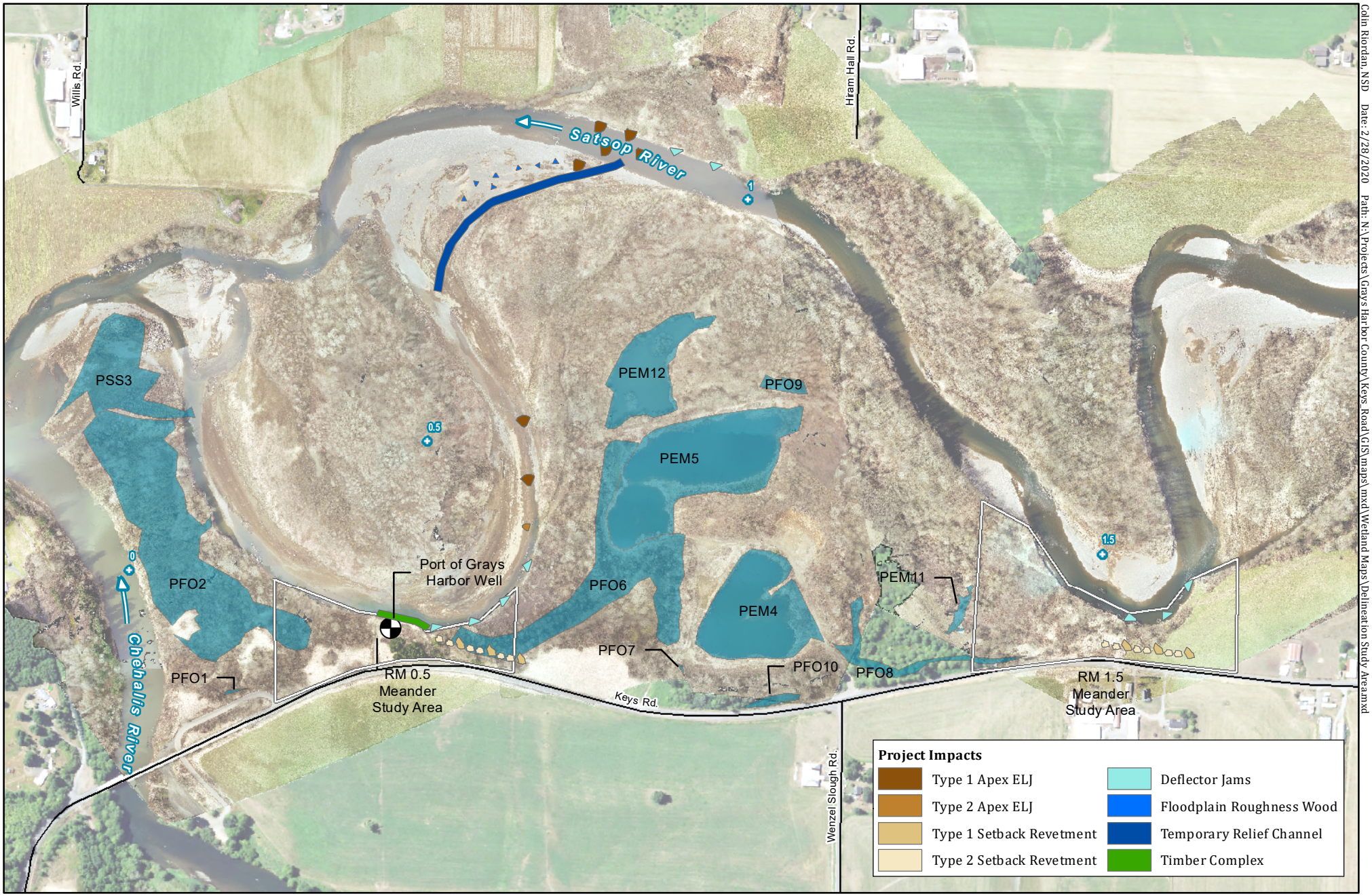
N

0 0.5 1 2 Miles

Delineation Areas
Roads
Cities

Natural Systems Design

Colin Riordan, NSD Date: 10/28/2019 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Wetland Maps\Project Vicinity.mxd




Keys Road Flood Protection

**Figure 2. Wetland Delineation Study Area and Project Impacts**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP

River Miles: National Hydrography Dataset

0 250 500 1,000 Feet

2019 Delineation Areas

2015 Wetlands, Ecolution

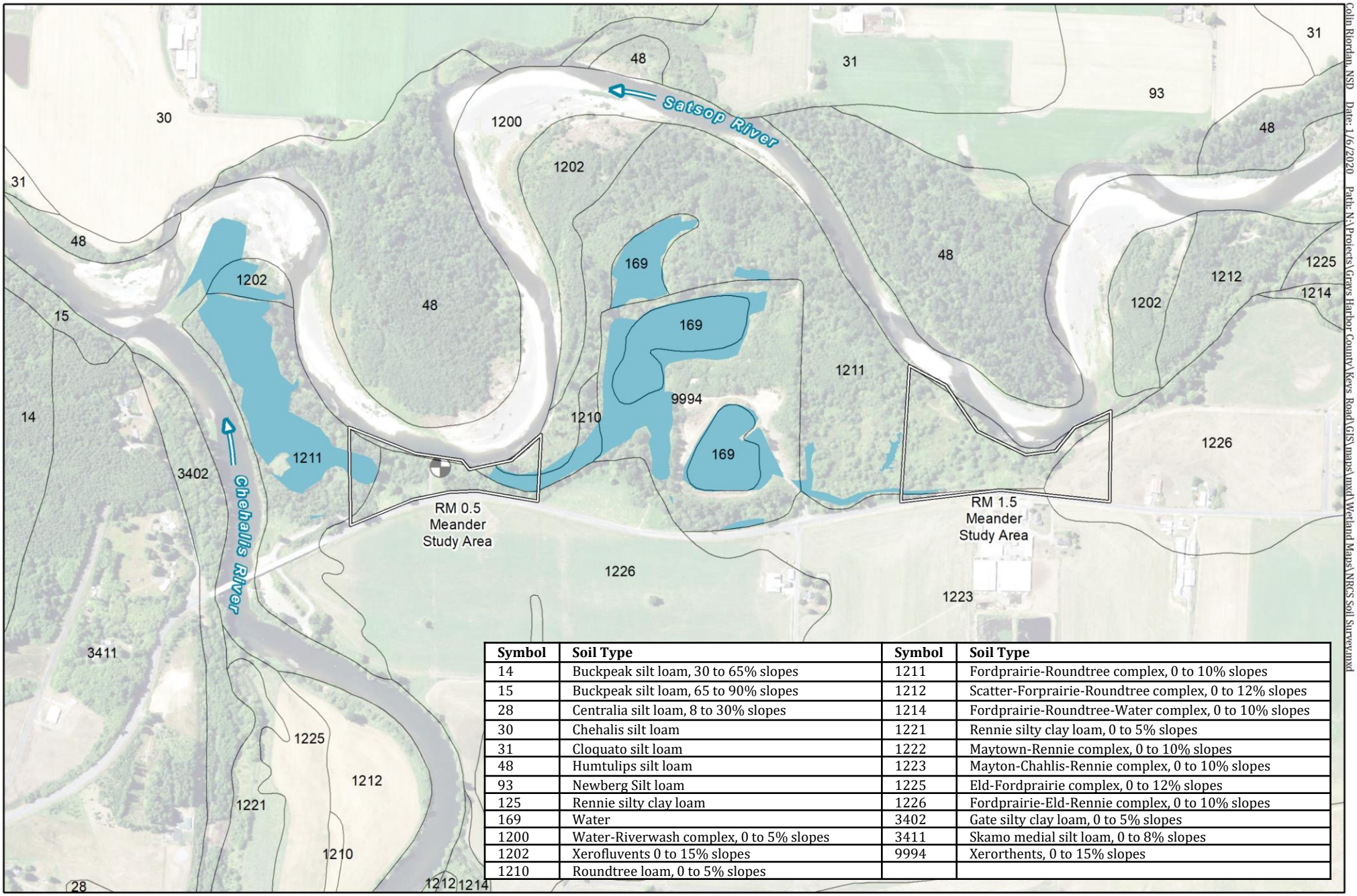
Port of Grays Harbor Well

River Mile (NHD)

Roads

Natural Systems Design

Colin Riordan, NSD Date: 2/28/2020 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Wetland Maps\Delineation Study Areamxd




| Symbol | Soil Type | Symbol | Soil Type |
|---|---|---|---|
| 14 | Buckpeak silt loam, 30 to 65% slopes | 1211 | Fordprairie-Roundtree complex, 0 to 10% slopes |
| 15 | Buckpeak silt loam, 65 to 90% slopes | 1212 | Scatter-Forprairie-Roundtree complex, 0 to 12% slopes |
| 28 | Centralia silt loam, 8 to 30% slopes | 1214 | Fordprairie-Roundtree-Water complex, 0 to 10% slopes |
| 30 | Chehalis silt loam | 1221 | Rennie silty clay loam, 0 to 5% slopes |
| 31 | Cloquato silt loam | 1222 | Maytown-Rennie complex, 0 to 10% slopes |
| 48 | Humtulips silt loam | 1223 | Mayton-Chahlis-Rennie complex, 0 to 10% slopes |
| 93 | Newberg Silt loam | 1225 | Eld-Fordprairie complex, 0 to 12% slopes |
| 125 | Rennie silty clay loam | 1226 | Fordprairie-Eld-Rennie complex, 0 to 10% slopes |
| 169 | Water | 3402 | Gate silty clay loam, 0 to 5% slopes |
| 1200 | Water-Riverwash complex, 0 to 5% slopes | 3411 | Skamo medial silt loam, 0 to 8% slopes |
| 1202 | Xerofluvents 0 to 15% slopes | 9994 | Xerorthents, 0 to 15% slopes |
| 1210 | Roundtree loam, 0 to 5% slopes | | |

Keys Road Flood Protection

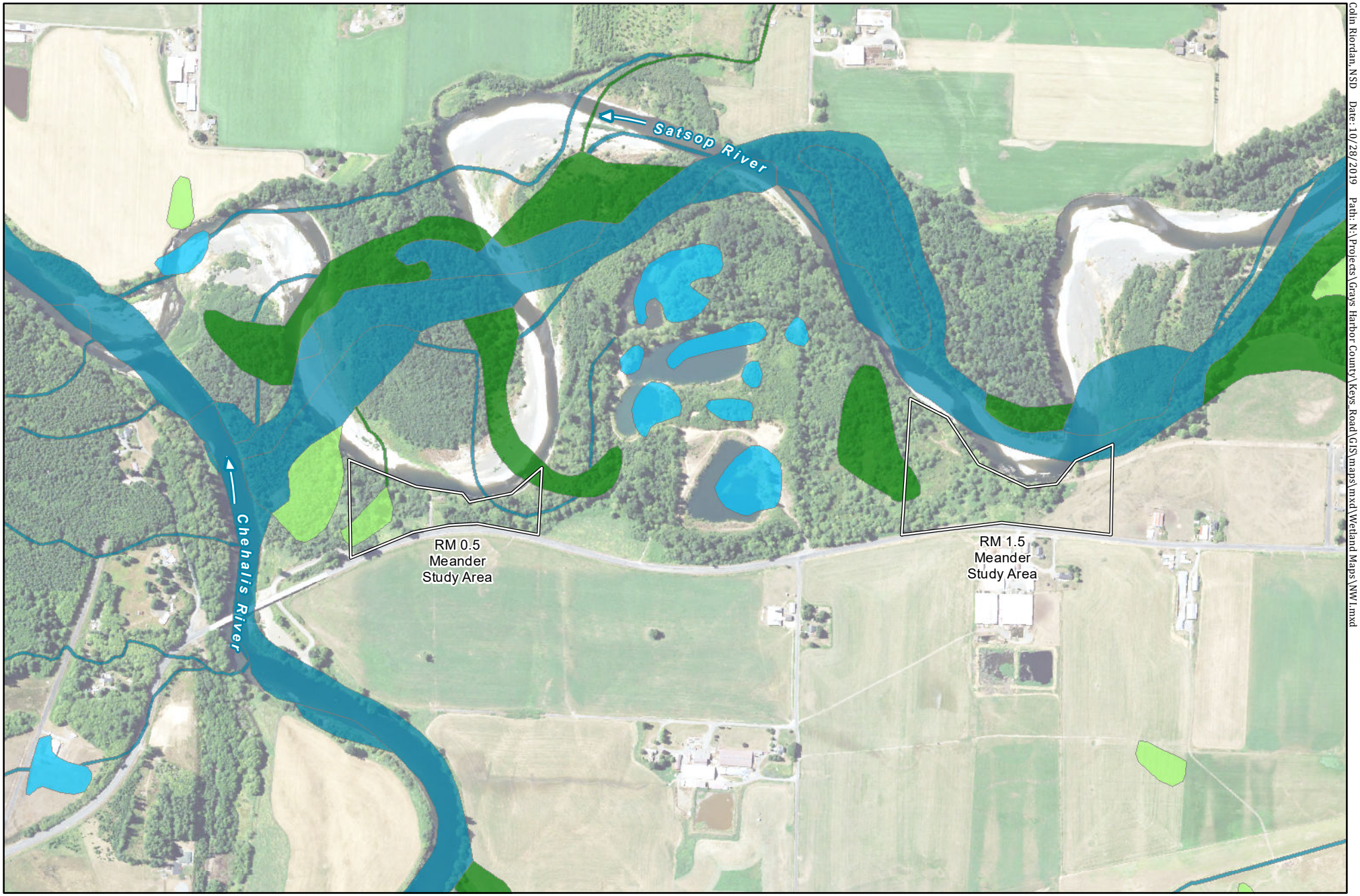
**Figure 3. NRCS Soil Survey**

Aerial Imagery: 2017 USDA NAIP
Soil Data: NRCS Soil Survey

0 250 500 1,000 Feet

Soils
2015 Wetlands, Ecoultions
2019 Delineation Areas
Port of Grays Harbor Well

Natural Systems Design




Keys Road Flood Protection

**Figure 4. National Wetland Inventory**

Aerial Imagery: 2017 USDA NAIP Wetland Data:
USFWS National Wetland Inventory

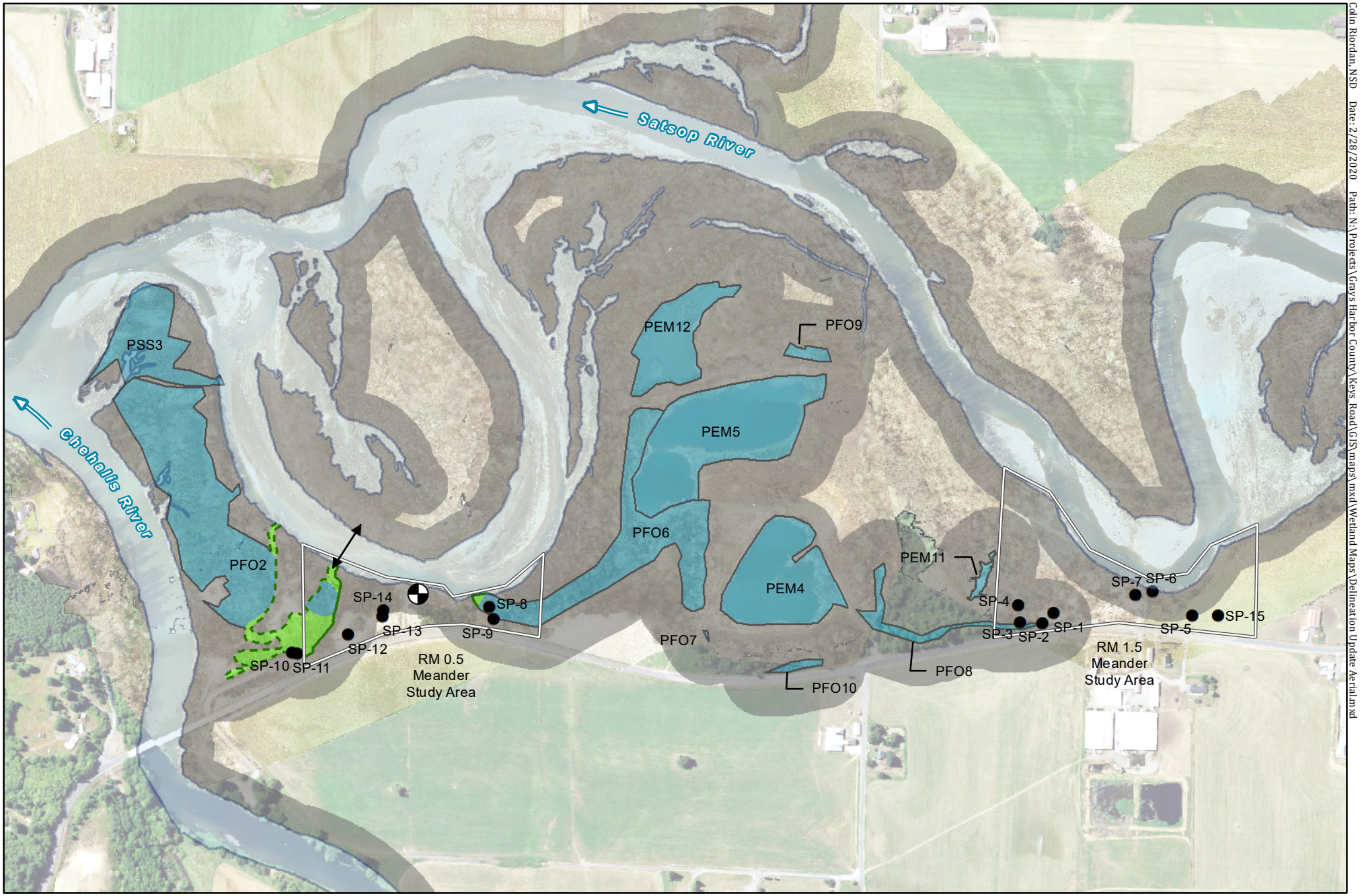
0 250 500 1,000 Feet

2019 Delineation Areas

**NWI Wetland TYpe**

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

Natural Systems Design




Keys Road Flood Protection

**Figure 5. Wetland Delineation Update**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP Wetland Data: Delineation surveys by Natural Systems Design (NSD) (2019) and Ecolution (2015)

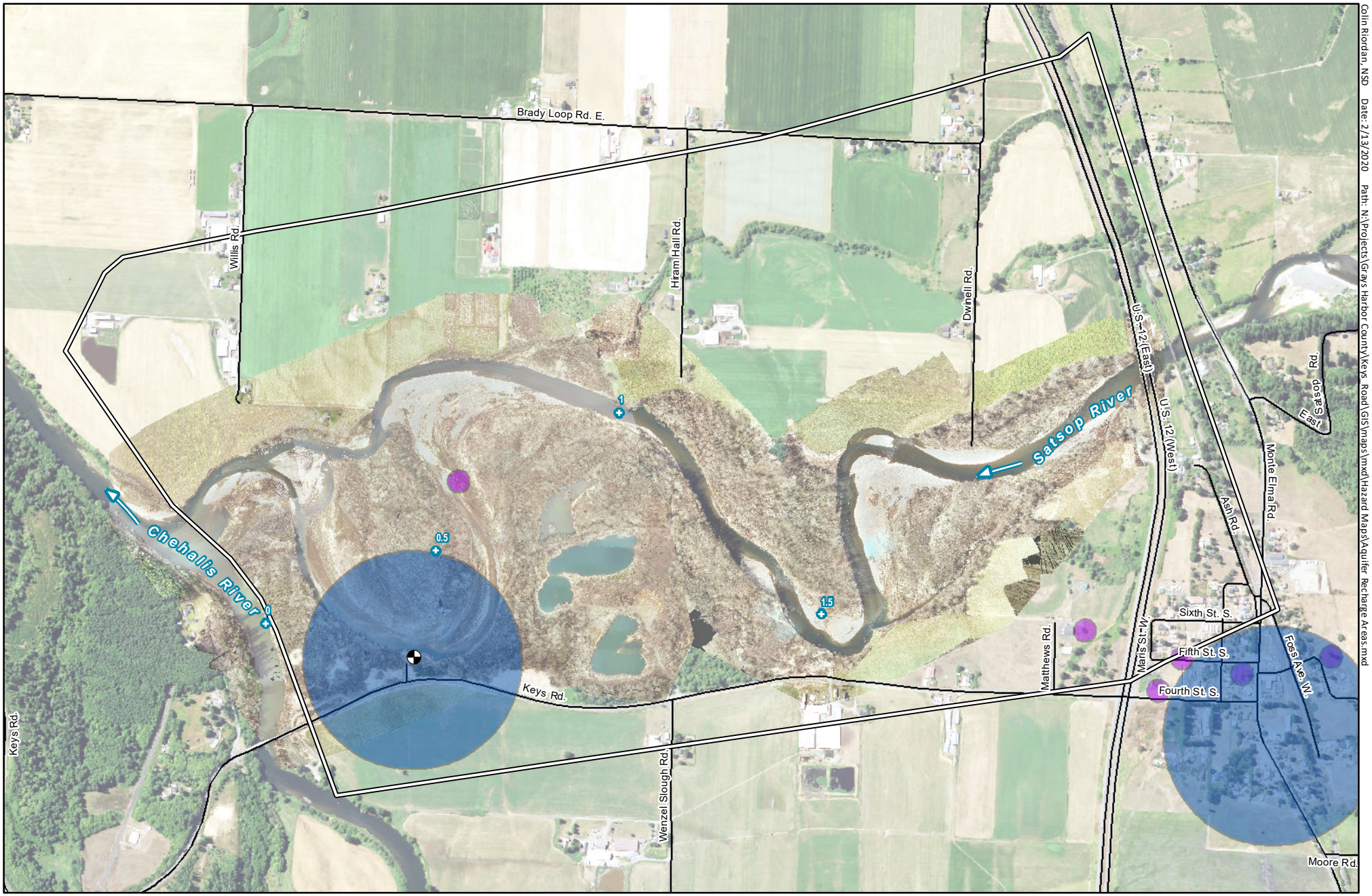
0 250 500 1,000 Feet

**Delineated Wetlands**
- Ecolution
- NSD

**Delineation Type**
- Ecolution boundary (unchanged)
- NSD Delineated
- Approximate Wetland Edge

- NSD Sample Plots
- Ordinary High Water (OHW)
- OHW XS Location
- Buffer
- 2019 Delineation Areas
- Port of Grays Harbor Well

Natural Systems Design




Keys Road Flood Protection

**Figure 6. Critical Aquifer Recharge Areas**

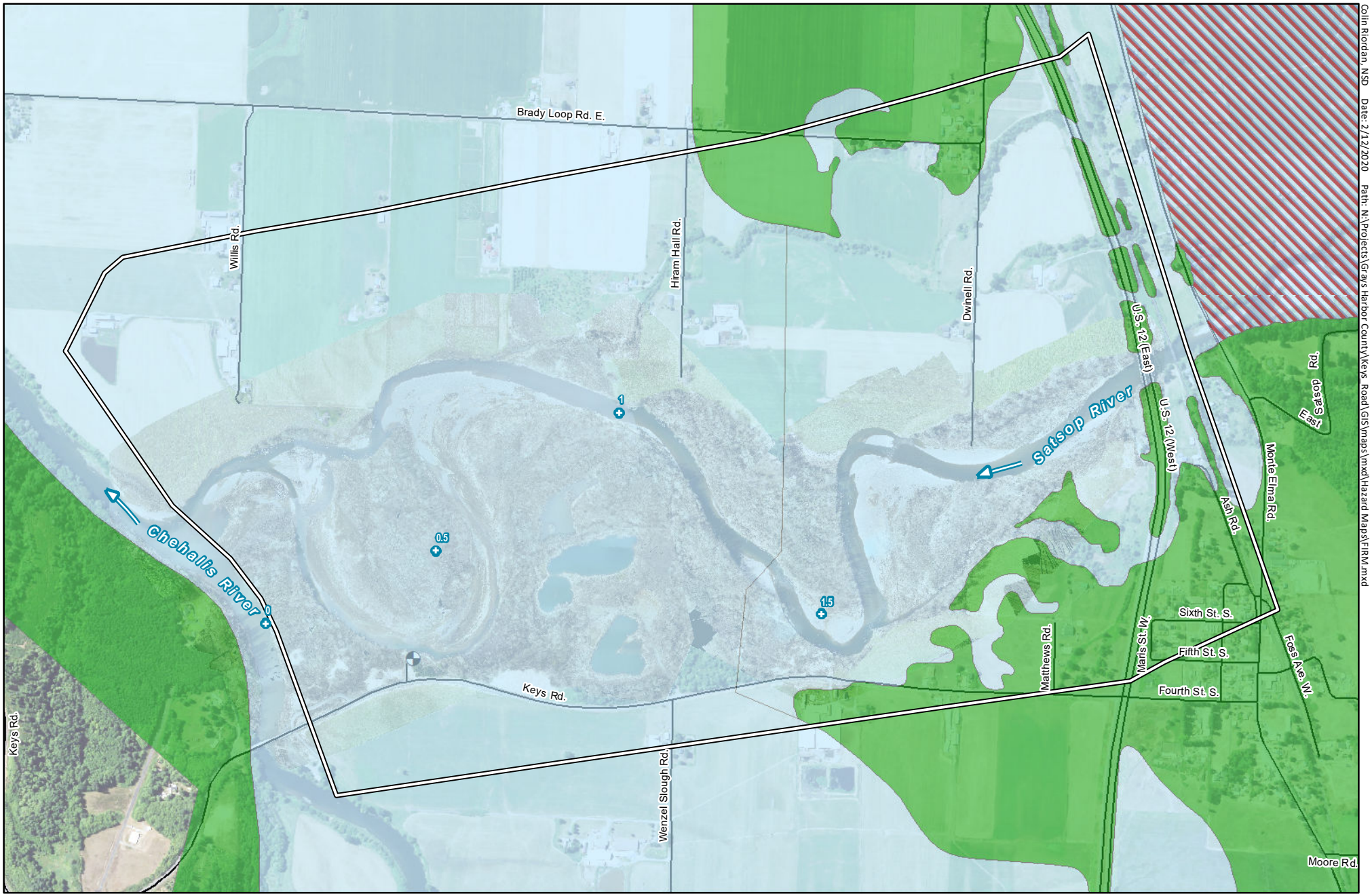
Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP
River Miles: National Hydrography Dataset Aquifer Recharge Data: Grays Harbor County

0 250 500 1,000 Feet

- Study reach
- Port of Grays Harbor Well
- Roads
- Critical Aquifer Recharge Area A
- Critical Aquifer Recharge Area B

Natural Systems Design

Colin Riordan, NSD Date: 2/13/2020 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Hazard Maps\Aquifer Recharge Areas.mxd

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Keys Road Flood Protection

**Figure 7. FEMA Flood Insurance Rate Map**

**Flood Zones**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP

River Miles: National Hydrography Dataset FEMA DFRIM

Data: Grays Harbor County

0 250 500 1,000 Feet

Study reach

Port of Grays Harbor Well

Roads

100-yr Floodplain

Area of minimal flood hazard

Floodway

Natural Systems Design


Colin Riordan, NSD Date: 2/13/2020 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Hazard Maps\Liquifaction.mxd

Keys Road Flood Protection

**Figure 8. Liquefaction Potential**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP
River Miles: National Hydrography Dataset
Liquefaction Data: Grays Harbor County

0 250 500 1,000 Feet

Study reach
Port of Grays Harbor Well
River Mile (NHD)
Roads

Liquefaction Potential
Bedrock
Very low
Low
Moderate to high

Natural Systems Design


Keys Road Flood Protection

**Figure 9. National Earthquake Hazards Reduction Program Site Class**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP
River Miles: National Hydrography Dataset DFRIM Data: Grays Harbor County

Natural Systems Design

Colin Riordan, NSD Date: 2/12/2020 Path: N:\Projects\Grays Harbor County\Keys_Road\GIS\maps\mxd\Permitting_Shapes.mxd

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# Attachment B

## U.S. Army Corps of Engineers Wetland Determination MVC Data Forms and OHWM Determination Forms

Natural Systems Design

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 1
Investigator(s): Luiting, Soden, Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRRA Lat: 46°59'27 Long: 123°28'55 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: NSD sample plot off north end of previous delineation's PF08 wetl in Canarygrass opening; higher elevation than wetland depression

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% ___ 20% ___ | ____ = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Salix sitchensis | 25 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% ___ 20% 5 | 25 = Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea | 95 | X | FACW |
| 2. Cirsium arvense | 5 | | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% ___ 20% ___ | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ___) | | | |
| 1. | | | |
| 2. | | | |
| | ____ = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species ____ | x 1 = ____ |
| FACW species ____ | x 2 = ____ |
| FAC species ____ | x 3 = ____ |
| FACU species ____ | x 4 = ____ |
| UPL species ____ | x 5 = ____ |
| Column Totals: ____ (A) | ____ (B) |

Prevalence Index = B/A = ____

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

**Hydrophytic Vegetation Present?** Yes X No

Remarks:

## SOIL

Sampling Point: 1

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-8 | 7.5YR 3/4 | 100 | | | | | fSL | |
| 8-16+ | 7.5YR 3/3 | 98 | 7.5YR 4/6 | 2 | C | M | fSL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks: faint redox starting at 8" - consistent with 2015 delineation Matrix not depleted; bright chroma

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes _____ No X Depth (inches): _____

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

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

Remarks: Hydrology naturally problematic at end of August - weak secondary indicators no indicators of flow; soils indicate fluctuations in saturation but limited persistence in saturation

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: PF08-2
Investigator(s): Luiting, Soden, Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRRA Lat: 46°59'26 Long: 123°08'55 Datum:
Soil Map Unit Name: Humptulips Silt Loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | **Is the Sampled Area within a Wetland?** Yes X No |
| Hydric Soil Present? | Yes X | No | |
| Wetland Hydrology Present? | Yes X | No | |

Remarks: near northern end of PF08 wetl. ~ 4+ feet lower elevation than SP1

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Alnus rubra | 75 | X | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 75 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Salix sitchensis | 30 | X | FACW |
| 2. Symphoricarpos albus* | 10 | X | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — 8 / 5 — 1 | 40 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea* | 25 | X | FACW |
| 2. Marah oregana | 5 | — | UPL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 30 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 75

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks:
* SYAL rooted along outer roadside edge
+ PHAR rooted along inner edge of depression
Coastal manroot not listed in NWPL - considered upland

## SOIL

Sampling Point: SP 2

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-1 | 10YR 4/2 | 100 | | | | | fSL | drift deposits |
| 1-16 | 10YR 4/2 | 80 | 7.5YR 5/6 | 20 | C | M | fSL | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks:

clear depleted matrix with >2% distinct or prom. redox

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes ___ No X Depth (inches): ___

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

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

Remarks:

Consistent with previous delineation observations of flow indicators through depressional wetland

* problematic hydro @ end August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: SP3
Investigator(s): Luiting, Soden, Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): floodplain depression Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): LRRA Lat: 46°59'25 Long: 123°28'55 Datum:
Soil Map Unit Name: Humptulips Silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes | No X | **Is the Sampled Area within a Wetland?** Yes ____ No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes X | No | |

Remarks: Edge of swale of 2yr flow - bright soils; non-hydric veg. consistent with previous wetland edge.

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Alnus rubra | 25 | X | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 25 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Rubus spectabilis | 10 | X | FAC |
| 2. Sambucus racemosa | 10 | X | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% 10 20% 4 | 20 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea | 10 | — | FACW |
| 2. Polystichum munitum | 5 | — | FACU |
| 3. Athyrium cyclosorum | 5 | — | FAC |
| 4. Impatiens noli-tangere | 5 | — | FACW |
| 5. X Reynoutria sachalinensis | 75 | X | FACU |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 100 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species ____ | x 1 = ____ |
| FACW species 15 | x 2 = 30 |
| FAC species 40 | x 3 = 120 |
| FACU species 85 | x 4 = 340 |
| UPL species ____ | x 5 = ____ |
| Column Totals: 140 (A) | 490 (B) |

Prevalence Index = B/A = 3.5

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

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

Remarks:
Shrubs + trees rooted along edge of flow path / depression
* Giant knotweed (Polygonum or Fallopia sachalinensis)

## SOIL

Sampling Point: 3

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16+ | 10YR 4/3 | 90 | 10YR 5/8 | 10 | C | M | FSL | no duff or horizonation present |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks: matrix not depleted - redox throughout profile but in bright matrix - adjacent depression receives flood flows and scour - appears to drain relatively quickly - distinct from SP2 - appears connected to river high flows via low channel off N end.

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (Includes capillary fringe) Yes ____ No X Depth (inches): _____

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

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

w/i 2yr flow (modeled)

Remarks:

flow deposits 3-4' up in vegetation; evidence of flood flows through adjacent depressional swale

*Problematic hydro @ end August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 4
Investigator(s): Luiting, Soden Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRRA Lat: 49°59' 25 Long: 123° 28' 52e Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes | No X | **Is the Sampled Area within a Wetland?** Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: Characteristic conditions to west of PF08 - dense forest with dense knotweed + blackberry understory - flat, no evidence flow

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Alnus rubra | 75 | X | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 75 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Symphoricarpos albus | 40 | X | FACU |
| 2. Rubus armeniacus | 10 | | FAC |
| 3. Rubus spectabalis | 10 | | FACW |
| 4. | | | |
| 5. | | | |
| 50% — 20% 12 | 60 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1.* Reynoutria sachalinensis | 25 | X | FACU |
| 2. Marah oregana | 5 | | UPL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% 6 | 30 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 70

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

**Hydrophytic Vegetation Present?** Yes No X

Remarks:
* Giant knotweed present throughout this portion of study area

## SOIL

Sampling Point: 4

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

| Depth (Inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-2 | 10YR 3/3 | 100 | | | | | FSL | |
| 2-16+ | 10YR 4/4 | 98 | 10YR 4/6 | 2 | C | M | FSL | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

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

Remarks:

- bright matrix, very dry soils
- no evidence of flow through this forested area
- soils drain quickly after flood + seasonal saturation

Not F8 | Area is not a closed depression
Redox extends 7(a" deep)

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes ____ No X Depth (Inches): _____

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

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

w/i 2yr flow (modeled)

Remarks:

no hydro indicators in field - no evidence of flow in this area

* Problematic hydro @ end August

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

Project/Site: Keys Road City/County: Grays Harbor County Sampling Date: 8/21/19

Applicant/Owner: Grays Harbor County State: WA Sampling Point: 5

Investigator(s): Luiting, Soder, Lee Section, Township, Range:

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Concave Slope (%): 0

Subregion (LRR): LRRA Lat: 46° 59' 34 Long: 123° 28' 55 Datum:

Soil Map Unit Name: Humptulips silt loam NWI classification: none

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

Are Vegetation X, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

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

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes ____ | No X | **Is the Sampled Area within a Wetland?** Yes ____ No X |
| Hydric Soil Present? | Yes ____ | No X | |
| Wetland Hydrology Present? | Yes ____ | No X | |

Remarks: swale in cow pasture within modeled 2yr flow; recent bank erosion & evidence of flow into field & this swale.

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — | = Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Agropyron repens / Elymus | 10 | | FAC |
| 2. Agrostis alba / gigantea | 60 | X | FAC |
| 3. Trifolium repens | 10 | | FAC |
| 4. Cirsium arvense | 20 | X | FACU |
| 5. Plantago lanceolata | trace | | FACU |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 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 ____ | x 1 = ____ |
| FACW species ____ | x 2 = ____ |
| FAC species 80 | x 3 = 240 |
| FACU species 20 | x 4 = 80 |
| UPL species ____ | x 5 = ____ |
| Column Totals: 100 (A) | 320 (B) |

Prevalence Index = B/A = 3.2

**Hydrophytic Vegetation Indicators:**

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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

Remarks:

*within grazed pasture area, naturally problematic veg

## SOIL

Sampling Point: 5

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-3 | 10YR 3/4 | 100 | | | | | | |
| 3-16+ | 10YR 4/4 | 80 | 10YR 4/6 | 20 | C | M | FSL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (If present):**

Type: _____

Depth (inches): _____

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

Remarks:

bright matrix - very dry powdery soils, no oxid rhizospheres
compact soils in pasture - swale connects to bank erosion area; not a closed depression, redox extends >6" NOT F8

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (Includes capillary fringe) Yes ____ No X Depth (inches): _____

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

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

within modelled 2yr flow

Remarks:

no indicators present in field; bright soils; area drains quickly from flow events

Hydro naturally problematic at end August

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

Project/Site: Keys Road City/County: GHC Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 6
Investigator(s): Luiting - Soden Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRRA Lat: 46° 59' 32 Long: 123° 28' 57 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation *X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | Is the Sampled Area within a Wetland? Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes X | No | |

Remarks: lowest area & depression - cows walk through area - bank actively eroding into this area - elevated 6' feet from river

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix sitchensis | 25 | X | FACW |
| 2. Alnus rubra | 20 | X | FAC |
| 3. | | | |
| 4. | | | |
| 50% 22.5 20% 9 | 45 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Rubus spectabalis | 10 | | FAC |
| 2. Symphoricarpus albus | 10 | | FACU |
| 3. Cornus sericea-alba | 45 | X | FACW |
| 4. Rubus armeniacus | 20 | X | FAC |
| 5. | | | |
| 50% 20% 17 | 85 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Agropyron repens / Elymus | 5 | X | FAC |
| 2. Marah oregana | 5 | X | upl |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% 20% | 10 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | 0 | = Total Cover | |

% Bare Ground in Herb Stratum 95*

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: *Veg recorded per community outside of fenced zone; dense shade outside cow impact area.

## SOIL

Sampling Point: 6

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-2 | 7.5YR 3/3 | 100 | | | | | Clay loam | |
| 2-16+ | 3/10Y gley 1 | 70 | mixed → | | | | Clay loam | w/ charcoal bits, |
| 2-16+ | 7.5YR 3/3 | 30 | matrix → | | | | Sand | sand lens, & buried organics in mixed matrix |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks:

Sandy lens variable in depth within profile; soil color not gleyed per MVC supplement. - relict soil? - no redox present; mixed matrix - surface layer washed away?

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes ___ No X Depth (inches): _____

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

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

w/i 2yr flow path

Remarks:

plot now at edge of actively eroding bank - drift deposits on cow fencing - recent avulsion & bank erosion connects area to high flow from river

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

Project/Site: Keys Road City/County: GHC Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 7
Investigator(s): Luiting, Soden Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): LRRA Lat: 46°59'31 Long: 123°28'57 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | |
| Hydric Soil Present? | Yes | No X | **Is the Sampled Area within a Wetland?** Yes | No X |
| Wetland Hydrology Present? | Yes X | No | |

Remarks: plot south of plot 6, in less disturbed terrace area indicative of northern forested portion of study area

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix sitchensis | 25 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 25 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Cornus sericea/alba | 40 | X | FACW |
| 2. Symphoricarpos alba | 40 | X | FACU |
| 3. Rubus spectabalis | 10 | | FAC |
| 4. Rubus armeniacus | 5 | | FAC |
| 5. | | | |
| 50% — 20% = 15 / 5 | 95 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea | 5 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 5 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 95

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

**Hydrophytic Vegetation Present?** Yes X No

Remarks: dense shade beneath tree + shrub thicket

## SOIL

Sampling Point: 7

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-3 | 10YR 3/3 | | | | | | fSL | |
| 3-16+ | 10YR 4/3 | 98 | 10YR 4/6 | 2 | C | M | fSL | fine redox w/ charcoal |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (If present):**

Type: _____

Depth (Inches): _____

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

Remarks: bright soils; flow through area; not a closed depression

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes ____ No X Depth (Inches): _____

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

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

Remarks: evidence of recent flow through floodplain - well drained soils; doesn't persist long enough to develop hydric soils

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: PF06-8
Investigator(s): Luiting, Soden, Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRRA Lat: 46°58'58 Long: 123°28'54 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: None PF01 close by
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No | **Is the Sampled Area within a Wetland?** Yes X No |
| Hydric Soil Present? | Yes X No | |
| Wetland Hydrology Present? | Yes X No | |

Remarks: Plot at southern end of PF06 wetl. - consistent with previous delineation

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Alnus rubra | 30 | X | FAC |
| 2. Salix lucida | 30 | X | FACW |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 60 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Salix lucida | 10 | X | FACW |
| 2. Cornus sericea/alba | 10 | X | FACW |
| 3. Rubus spectabalis | 10 | X | FAC |
| 4. | | | |
| 5. | | | |
| 50% — 20% — | 30 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Solanum dulcamara | 20 | X | FAC |
| 2. Impatiens noli-tangere | 10 | — | FACW |
| 3. Phalaris arundinacea | 70 | X | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 100 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: Forested depression connected to river @ South end

## SOIL

Sampling Point: 8

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16+ | 10YR 3/2 | 90 | 10YR 4/6 | 10 | C | M | FSL | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks: dark, dull surface soils with prominent redox distinct from surrounding soils

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

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

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

Remarks: Connected to river at Southern end - channelized / scoured center path within the depression - Clear signs flow

Problematic hydro at end August - hydric soils

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 9
Investigator(s): Luiting Soden Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace slope Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): LRR A Lat: 46° 58' 59 Long: 123° 28' 53 Datum:
Soil Map Unit Name: Humptulips Silt Loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___, Soil ___, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No ___ | **Is the Sampled Area within a Wetland?** Yes ___ No X |
| Hydric Soil Present? | Yes ___ | No X | |
| Wetland Hydrology Present? | Yes ___ | No X | |

Remarks: Plot along south eastern edge of wetl. PF06 - defines upland edge

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Alnus rubra | 50 | X | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 50 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Rubus spectabalis | 35 | X | FAC |
| 2. Symphoricarpos alba | 30 | X | FACU |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — 13 | 65 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea | 75 | X | FACW |
| 2. Carex obnupta | 10 | | OBL |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% 17 | 85 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ___) | | | |
| 1. | | | |
| 2. | | | |
| | ___ | = Total Cover | |

% Bare Ground in Herb Stratum 15

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

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

Remarks: dense shade along forested slope

## SOIL

Sampling Point: 9

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR 4/3 | 100 | | | | | FSL | no redox present |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks: no indicators; bright & dry soil

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

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

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

Remarks: upland edge of wetland - no indicators of hydro - clearly non hydric soils

Hydro naturally problematic in late August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: WetA-10
Investigator(s): Whiting Soden Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRRA Lat: 46°58'48 Long: 123°28'50 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | |
|---|---|---|
| Hydrophytic Vegetation Present? | Yes X No | Is the Sampled Area within a Wetland? Yes X No |
| Hydric Soil Present? | Yes X No | |
| Wetland Hydrology Present? | Yes X No | |

Remarks: depression/swale E/W trending; new=wetland A
Forested swale to river not part of previous delineation

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix lucida | 40 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 40 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Cornus sericea/alba | 50 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — | 50 | = Total Cover | |
| **Herb Stratum** (Plot size: 5) | | | |
| 1. Phalaris arundinacea | 50 | X | FACW |
| 2. Impatiens nolitangere | 10 | | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% 30 20% 12 | 60 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| % Bare Ground in Herb Stratum 40 | | = Total Cover | |

**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 | x 1 = |
| FACW species | x 2 = |
| FAC species | x 3 = |
| FACU species | x 4 = |
| UPL species | x 5 = |
| Column Totals: (A) | (B) |

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks:
wetl edge just lower than 2 yr flow elevation
Wetl continues South out of study area

## SOIL

Sampling Point: 10

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR 3/2 | 90 | 10YR 4/6 | 10 | C | M | FSL | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks: dark, dull matrix with prominent redox

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

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

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

Remarks: along 2yr. flow elevation - appears connected to river - clear signs flow

Hydro problematic at end August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 11
Investigator(s): Luiting Salen Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): slight slope Slope (%): <1%
Subregion (LRR): LRRA Lat: 46°58'49 Long: 123°28'50 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | |
| Hydric Soil Present? | Yes | No X | Is the Sampled Area within a Wetland? Yes No X |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: Field Upland northeast edge of wet. A - wetland curves west toward river

### VEGETATION – Use scientific names of plants.

| | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| Tree Stratum (Plot size: 30') | | | |
| 1. Salix lucida | 20 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 20 | = Total Cover | |
| Sapling/Shrub Stratum (Plot size: 10') | | | |
| 1. Salix sitchensis | 30 | X | FACW |
| 2. Rubus spectabalis | 25 | X | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% 5 | 55 | = Total Cover | |
| Herb Stratum (Plot size: 5') | | | |
| 1. Urtica dioica | 20 | X | FAC |
| 2. Impatiens noli-tangere | 10 | | FACW |
| 3. Phalaris arundinacea | 40 | X | FACW |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% 35 20% 14 | 70 | = Total Cover | |
| Woody Vine Stratum (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 30

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: densely vegetated edge of swale

## SOIL

Sampling Point: 11 upl.

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16" | 10YR 3/3 | 100 | | | | | SiL | no redox |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

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

Remarks: no indicators present

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes _____ No X Depth (Inches): _____

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

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

Remarks:

Slope above wetl. ft - outside 2yr flow extent, no signs first flow; clearly non hydric soils

Hydro problematic at end Aug

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: upl 12
Investigator(s): Luiting Soden Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): depression on terrace Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): LRRA Lat: 46°58'51 Long: 123°28'52 Datum:
Soil Map Unit Name: Chehalis silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | Is the Sampled Area within a Wetland? Yes ____ No X |
| Hydric Soil Present? | Yes ____ | No X | |
| Wetland Hydrology Present? | Yes ____ | No X | |

Remarks: Canarygrass field south of well area

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% ____ 20% ____ | ____ = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% ____ 20% ____ | ____ = Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea | 100% | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% ____ 20% ____ | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ____) | | | |
| 1. | | | |
| 2. | | | |
| | ____ = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

| Total % Cover of: | Multiply by: |
|---|---|
| OBL species ____ | x 1 = ____ |
| FACW species ____ | x 2 = ____ |
| FAC species ____ | x 3 = ____ |
| FACU species ____ | x 4 = ____ |
| UPL species ____ | x 5 = ____ |
| Column Totals: ____ (A) | ____ (B) |

Prevalence Index = B/A = ____

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

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

Remarks:

## SOIL

Sampling Point: 12

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16+ | 10YR 3/3 | 100 | | | | | fSL | no redox |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks:

no indicators present

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

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

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

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

Remarks:

PFO/PSS Swale/Depression along road - not connected to river - no signs flow; non hydric soils

*Hydrology naturally problematic in late August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 13
Investigator(s): Kristina Soderlee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace depression Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): LRR A Lat: 46°58'53 Long: 123°28'53 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | |
| Hydric Soil Present? | Yes | No X | Is the Sampled Area within a Wetland? Yes No X |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: Canary grass depression along road - South of well
Outer edge of willow thicket

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — | = Total Cover | | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Urtica dioica | 90 | X | FAC |
| 2. Phalaris arundinacea | 10 | X | FACW |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 100 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks:

## SOIL

Sampling Point: 13

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR 3/3 | 100 | | | | | Si loam | no redox |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (Inches): _____

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

Remarks: no indicators present

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes _____ No X Depth (Inches): _____

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

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

Remarks: no evidence of hydrology & non hydric soils clearly

Hydro problematic at end August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 14
Investigator(s): Luiting Soden Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace swale Local relief (concave, convex, none): Concave Slope (%):
Subregion (LRR): LRRA Lat: 48°58'53 Long: 123°28'54 Datum:
Soil Map Unit Name: Humptulips silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | |
| Hydric Soil Present? | Yes | No X | Is the Sampled Area within a Wetland? Yes No X |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: Willow highflow swale South of well – west of sp13

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. Salix lucida | 40 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | 40 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Cornus sericea/alba | 40 | X | FACW |
| 2. Rubus spectabilis | 20 | X | FAC |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — | 60 | = Total Cover | |
| **Herb Stratum** (Plot size: 5') | | | |
| 1. Phalaris arundinacea | 20 | X | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 20 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | | = Total Cover | |

% Bare Ground in Herb Stratum 80

**Dominance Test worksheet:**
Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks: densely shaded

## SOIL

Sampling Point: 14

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Redox Features Type[1] | Redox Features Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR4/4 | 100 | | | | | FSL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks:

bright; dry soils; no redox

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

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

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

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

Remarks:

no signs of flow; non-hydric soils

Hydrology naturally problematic at end August

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

Project/Site: Keys Road City/County: Grays Harbor Sampling Date: 8/21/19
Applicant/Owner: Grays Harbor County State: WA Sampling Point: 15
Investigator(s): Luiting, Soden, Lee Section, Township, Range:
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): LRR A Lat: 46° 59' 35 Long: 123° 28' 56 Datum:
Soil Map Unit Name: Humptulips Silt loam NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation X, Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation , Soil , or Hydrology X naturally problematic? (If needed, explain any answers in Remarks.)

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

| | | | |
|---|---|---|---|
| Hydrophytic Vegetation Present? | Yes X | No | Is the Sampled Area within a Wetland? Yes No X |
| Hydric Soil Present? | Yes | No X | |
| Wetland Hydrology Present? | Yes | No X | |

Remarks: northern study area: swale through cow pasture; connects to eroded bank area.

### VEGETATION – Use scientific names of plants.

| | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| Tree Stratum (Plot size: 30') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 50% — 20% — | = Total Cover | | |
| Sapling/Shrub Stratum (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 50% — 20% — | = Total Cover | | |
| Herb Stratum (Plot size: 5') | | | |
| 1. Agrostis alba/gigantea | 50 | X | FAC |
| 2. Cirsium arvense | 20 | X | FACU |
| 3. Agropyron repens/Elymus | 20 | X | FAC |
| 4. ** Senecio jacobaea | 5 | | FACU |
| 5. Trifolium repens | 5 | | FAC |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| 50% — 20% — | 100 = Total Cover | | |
| Woody Vine Stratum (Plot size: ) | | | |
| 1. | | | |
| 2. | | | |
| | = Total Cover | | |

% Bare Ground in Herb Stratum 0

**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 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes X No

Remarks:

*grazed cowpasture ** Senecio vulgaris

## SOIL

Sampling Point: 15

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

| Depth (inches) | Matrix Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-16 | 10YR 3/4 | 90 | 10YR 4/6 | 10 | C | M | FSL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

**Indicators for Problematic Hydric Soils[3]:**

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

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

**Restrictive Layer (if present):**

Type: ___

Depth (inches): ___

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

Remarks:

bright soils, dry & compact; connects to recently eroded bank area; not a closed depression

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (Includes capillary fringe) Yes ___ No X Depth (inches): ___

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

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

Remarks: no evidence of recent flow through this swale

Hydro naturally problematic at end August

# Appendix A: Field data form

## General Information

Site/Project Name/Owner: Keys Road Flood Protection Grays Harbor County
Location: Lower Satsop River RM 8.5
Description:

The following field form is for use in the field to help in making ordinary high water mark delineations on streams. The form should be used as a guide. A team consisting of a hydrologist/ geomorphologist and a biologist may be needed to accurately determine the ordinary high water mark.

## General Observations: Day of Site Visit

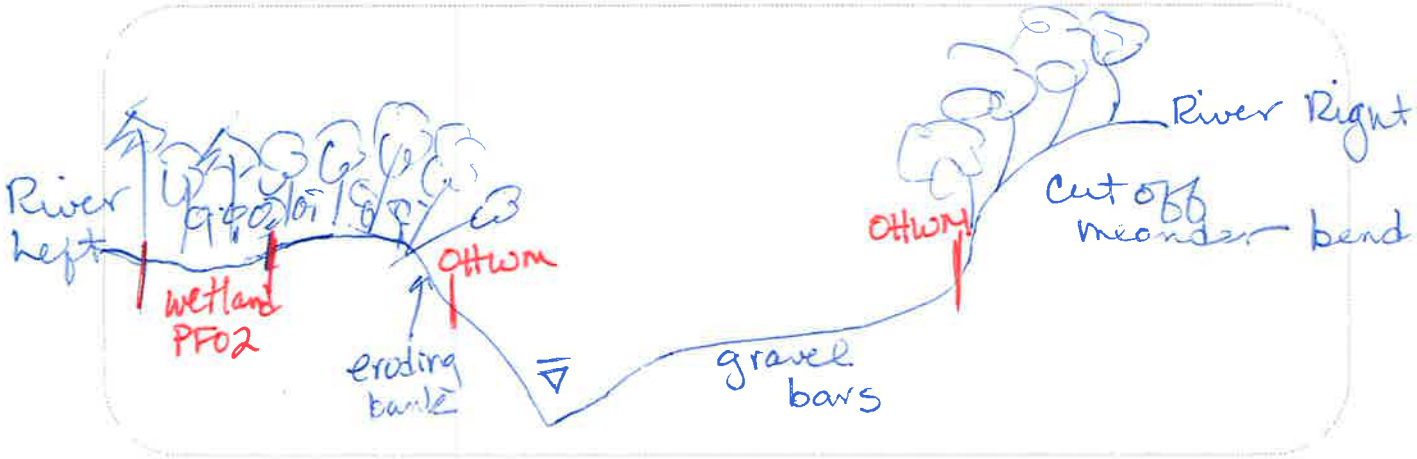
| | | | | |
|---|---|---|---|---|
| Date of site visit: | 8-21-2019 | | | |
| Time of site visit: | full day | | | |
| Weather conditions: | steady rain most of day | | | |
| Watershed development: | Highly developed ○ | | Mod. Developed ✓ | Undeveloped ○ |
| Reach development: | Highly developed ○ | | Mod. Developed ✓ | Undeveloped ○ |
| Recent site disturbance? | No ✓ | Yes ○ | Describe: | |
| Upstream flow control devices? | No ✓ | Yes ○ | Describe: | |
| Bank armoring at the site? | No ○ | Yes ✓ | Describe: riprap along shoreline at Port's well | |
| Bank armoring up or downstream? | No ○ | Yes ✓ | Describe: revetment on RL @ RM 1.4 | |
| Observable tidal backwater? | No ✓ | Yes ○ | | |
| In-water structures? (i.e. bridge pilings, railroad embankments) | No ✓ | Yes ○ | Describe: | |
| Animals grazing in riparian zone? | No ○ | Yes ✓ | Describe: extreme upstream end of study area on RL @ RM 1.5 | |
| Observable beaver activity? | No ✓ | Yes ○ | Describe: | |

## Complete Vegetation Transects

- Use guidelines in Chapter 4 to complete vegetation transects.
- Determine upper and lower bounds of the OHWM from vegetation transects.
- After completing vegetation transects, look for more field indicators near the upper and lower bounds of the OHWM. Use the checklist as guidance.

## Sketch

If a simple site, sketch a cross-sectional diagram of the site below. Include location of the waterway and upper and lower bounds of the OHWM defined by the vegetation communities or other OHWM indicators. Page 3 of the data form can be used for more complex sketches



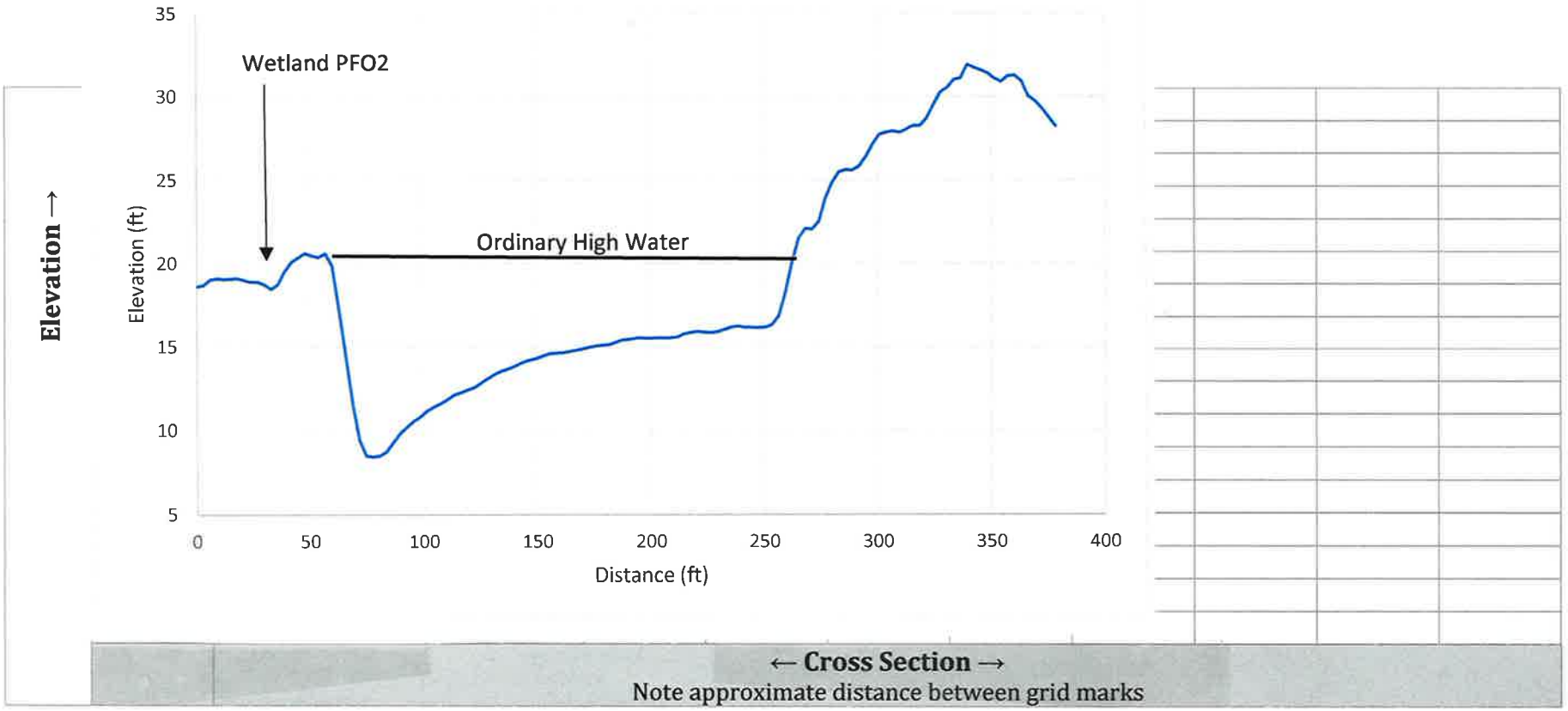

## Additional Indicators

Check the indicators that are observable at the site that provide rationale for establishing the OHWM at this location. The rationale should be described in detail in the report and should be supported with photographs taken during the site visit.

| | Soil and geomorphic indicators [24] | Vegetative indicators [25] | Other indicators |
|---|---|---|---|
| **Below OHWM** | ○ Sediment bars<br>✓ Scour line<br>○ Clean cobbles/boulders.<br>✓ Bank erosion/scour<br>✓ Lack of soil horizons | Vegetation tolerant of inundation or high flow disturbances such as:<br>✓ Willows<br>○ Black cottonwood<br>○ Japanese knotweed<br>○ Skunk cabbage<br>○ Aquatic plants | ✓ Exposed roots/root scour<br>○ Drainage patterns, as shown by flattened vegetation<br>○ Aquatic animals<br>○ Algal mats<br>○ Iron staining |

[24] Refer to Chapter 4 for a more complete description of indicators.

[25] Species are provided as examples. Refer to Appendix B for a more complete listing of plant species and their distribution across the OHWM gradient. Some species occur in more than one category depending on site conditions. For example Indian plum and red alder may straddle the OHWM where soil drainage is high. They may occur above OHWM were soil drainage is low to moderate.




| Plant Distribution Across OHWM Gradient | | |
|---|---|---|
| **Above OHWM** | **At/Straddling OHWM** | **Above OHWM** |
| red alder<br>Scattered conifers | willow | willow, alder |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| | Soil and geomorphic indicators [24] | Vegetative indicators [25] | Other indicators |
|---|---|---|---|
| **At or straddling OHWM** | ✓ Top of bank river left<br>○ Toe of lowest terrace (if terrace has developed horizons which may include a duff layer and A and B horizons versus freshly deposited alluvium)<br>✓ Benches River right | ✓ Willows<br>○ Western red cedar<br>○ Vine maple (streams)<br>○ Black cottonwood<br>○ Red alder<br>○ Salmonberry<br>○ Nootka rose<br>○ Maidenhair and lady fern<br>○ Blackberries<br>○ Dunegrasses | ✓ Sediment lines on vegetation or other fixed objects<br>○ Change from channel deposits to older alluvium.<br>○ Darker stain lines on fixed objects<br>✓ Exposed roots/root scour.<br>✓ Drainage patterns, as evidenced by flattened vegetation<br>✓ Weathered and buried driftwood |
| **Above OHWM** | ○ Hillslope toe<br>✓ Terraces or alluvium with an organic horizon or other developed soil horizons<br>○ Relic floodplain surface<br>✓ Well developed soil A andB horizons/duff layer | ○ Indian plum<br>✓ Red alder<br>✓ Western red cedar<br>✓ Douglas fir<br>○ Western hemlock<br>○ Ponderosa pine<br>○ Oregon white oak<br>○ Coast pine<br>○ Quaking aspen<br>○ Vine maple (lakes)<br>✓ Blackberries | ○ Lighter or no staining on fixed objects<br>✓ Overbank deposits |

## Notes

River has avulsed Nov 27 2018, largely cut off bend through study area near Porte well.

River has also eroded throughout portions of study area.

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# Appendix C

## Washington State Department of Ecology Wetland Rating System for Western Washington Forms and Figures

Natural Systems Design

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Riverine

Wetland name or number A/PF02

# RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A/PF02 Date of site visit: 8-21-19

Rated by Luiting/Soden Trained by Ecology? X Yes ___ No Date of training 2007 + update

**HGM Class used for rating** Riverine Wetland has multiple HGM classes? ___ Y X N

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

Source of base aerial photo/map 2017 NAIP aerial / March 2019 NSD drone

## OVERALL WETLAND CATEGORY X (based on functions___ or special characteristics___)

### 1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 23 - 27

X **Category II** – Total score = 20 - 22

___ **Category III** – Total score = 16 - 19

___ **Category IV** – Total score = 9 - 15

| FUNCTION | Improving Water Quality | Hydrologic | Habitat | |
|---|---|---|---|---|
| | *Circle the appropriate ratings* | | | |
| Site Potential | H (M) L | H (M) L | H (M) L | |
| Landscape Potential | H (M) L | H (M) L | (H) M L | |
| Value | (H) M L | (H) M L | (H) M L | TOTAL |
| **Score Based on Ratings** | 7 | 7 | 8 | 22 |

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

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

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

| CHARACTERISTIC | CATEGORY |
|---|---|
| **Estuarine** | I II |
| **Wetland of High Conservation Value** | I |
| **Bog** | I |
| **Mature Forest** | I |
| **Old Growth Forest** | I |
| **Coastal Lagoon** | I II |
| **Interdunal** | I II III IV |
| None of the above | NA |

Wetland name or number A/PFO2

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

## Depressional Wetlands

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

## Riverine Wetlands

| Map of: | To answer questions: | Figure # |
|---|---|---|
| Cowardin plant classes | H 1.1, H 1.4 | C.1 |
| Hydroperiods | H 1.2 | C.2 |
| Ponded depressions | R 1.1 | C.2 |
| Boundary of area within 150 ft of the wetland *(can be added to another figure)* | R 2.4 | C.2 |
| Plant cover of trees, shrubs, and herbaceous plants | R 1.2, R 4.2 | C.1 |
| Width of unit vs. width of stream *(can be added to another figure)* | R 4.1 | C.2 |
| Map of the contributing basin | R 2.2, R 2.3, R 5.2 | C.3 |
| 1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat | H 2.1, H 2.2, H 2.3 | C.4 |
| Screen capture of map of 303(d) listed waters in basin (from Ecology website) | R 3.1 | C.5 |
| Screen capture of list of TMDLs for WRIA in which unit is found (from web) | R 3.2, R 3.3 | C.5 |

## Lake Fringe Wetlands

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

## Slope Wetlands

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

Wetland name or number A/PFO2

# HGM Classification of Wetlands in Western Washington

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

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

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

NO – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

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

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

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

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

NO – go to 3 **YES** – The wetland class is **Flats**

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

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

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

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

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

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

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

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

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

NO – go to 5 **YES –** The wetland class is **Slope**

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

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

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

X The overbank flooding occurs at least once every 2 years.

Wetland name or number A/PFO2

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

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

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

NO – go to 7 **YES** – The wetland class is **Depressional**

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

NO – go to 8 **YES** – The wetland class is **Depressional**

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

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

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

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

Wetland name or number A/PF02

## RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

| R 1.0. Does the site have the potential to improve water quality? | | |
|---|---|---|
| R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: | | |
| Depressions cover > 3/4 area of wetland | points = 8 | 2 |
| Depressions cover > ½ area of wetland | points = 4 | |
| Depressions present but cover < ½ area of wetland | points = 2 | |
| No depressions present | points = 0 | |
| R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) | | |
| Trees or shrubs > 2/3 area of the wetland | points = 8 | 8 |
| Trees or shrubs > 1/3 area of the wetland | points = 6 | |
| Herbaceous plants (> 6 in high) > 2/3 area of the wetland | points = 6 | |
| Herbaceous plants (> 6 in high) > 1/3 area of the wetland | points = 3 | |
| Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland | points = 0 | |
| Total for R 1 — Add the points in the boxes above | | 10 |

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

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

**Rating of Landscape Potential** If score is: ___ **3-6 = H** X **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

| R 3.0. Is the water quality improvement provided by the site valuable to society? | | |
|---|---|---|
| R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? | Yes = 1 No = 0 | 1 |
| R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? | Yes = 1 No = 0 | 1 |
| R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage in which the unit is found*) | Yes = 2 No = 0 | 2 |
| Total for R 3 — Add the points in the boxes above | | 4 |

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

Wetland name or number A/PF02

## RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

**R 4.0. Does the site have the potential to reduce flooding and erosion?**

| | | |
|---|---|---|
| R 4.1. Characteristics of the overbank storage the wetland provides:<br>*Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).*<br>If the ratio is more than 20 | points = 9 | 2 |
| If the ratio is 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 | |
| R 4.2. Characteristics of plants 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. These are NOT Cowardin classes).*<br>Forest or shrub for > $^1/_3$ area OR emergent plants > $^2/_3$ area | points = 7 | 7 |
| Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area | points = 4 | |
| Plants do not meet above criteria | points = 0 | |
| Total for R 4 | Add the points in the boxes above | 9 |

**Rating of Site Potential** If score is: ___12-16 = H X 6-11 = M ___0-5 = L *Record the rating on the first page*

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

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

**Rating of Landscape Potential** If score is: ___3 = H X 1 or 2 = M ___0 = L *Record the rating on the first page*

**R 6.0. Are the hydrologic functions provided by the site valuable to society?**

| | | |
|---|---|---|
| R 6.1. Distance to the nearest areas downstream that have flooding problems?<br>*Choose the description that best fits the site.*<br>The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) | points = 2 | 2 |
| Surface flooding problems are in a sub-basin farther down-gradient | points = 1 | |
| No flooding problems anywhere downstream | points = 0 | |
| R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? | Yes = 2 No = 0 | 0 |
| Total for R 6 | Add the points in the boxes above | 2 |

**Rating of Value** If score is: X 2-4 = H ___1 = M ___0 = L *Record the rating on the first page*

Wetland name or number A/PF02

**These questions apply to wetlands of all HGM classes.**

**HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat

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

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

Entire Wetland Based on Ecolution 2015 Delineation

___Aquatic bed
__X__Emergent
__X__Scrub-shrub (areas where shrubs have > 30% cover)
__X__Forested (areas where trees have > 30% cover)

4 structures or more: points = (4)
3 structures: points = 2
2 structures: points = 1
1 structure: points = 0

*If the unit has a Forested class, check if:*

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

4

H 1.2. Hydroperiods

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

Based on Entire Wetland per Ecolution 2015 Delineation

__X__Permanently flooded or inundated
__X__Seasonally flooded or inundated
__X__Occasionally flooded or inundated
__X__Saturated only (outer edges)
__X__Permanently flowing stream or river in, or adjacent to, the wetland (west end)
___Seasonally flowing stream in, or adjacent to, the wetland
___**Lake Fringe wetland**
___**Freshwater tidal wetland**

4 or more types present: points = (3)
3 types present: points = 2
2 types present: points = 1
1 type present: points = 0

**2 points**
**2 points**

3

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 $ft^2$.

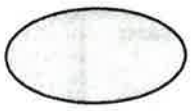
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

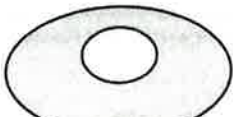
1

H 1.4. Interspersion of habitats

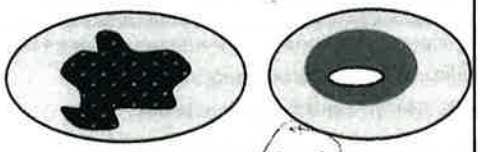
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



**None** = 0 points



**Low** = 1 point



**Moderate** = 2 points

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

2

Wetland name or number A/PF02

| | |
|---|---|
| H 1.5. Special habitat features:<br>Check the habitat features that are present in the wetland. *The number of checks is the number of points.*<br>X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).<br>X Standing snags (dbh > 4 in) within the wetland<br>X Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)<br>___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)*<br>X At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)*<br>___ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*) | 4 |
| Total for H 1 — Add the points in the boxes above | 14 |

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

**H 2.0. Does the landscape have the potential to support the habitat functions of the site?**

| | |
|---|---|
| H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*).<br>*Calculate:* % undisturbed habitat 45 + [(% moderate and low intensity land uses)/2] 10 (20/2) = 55 %<br>nearly all adjacent habitat is undisturbed to north, west, and south<br>If total accessible habitat is:<br>> 1/3 (33.3%) of 1 km Polygon — points = 3<br>20-33% of 1 km Polygon — points = 2<br>10-19% of 1 km Polygon — points = 1<br>< 10% of 1 km Polygon — points = 0<br>accessibility break at Keys Road | 3 |
| H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.<br>*Calculate:* % undisturbed habitat 45 + [(% moderate and low intensity land uses)/2] 40/2 (20) = 65 %<br>Undisturbed habitat > 50% of Polygon — points = 3<br>Undisturbed habitat 10-50% and in 1-3 patches — points = 2<br>Undisturbed habitat 10-50% and > 3 patches — points = 1<br>Undisturbed habitat < 10% of 1 km Polygon — points = 0 | 3 |
| H 2.3. Land use intensity in 1 km Polygon: If<br>> 50% of 1 km Polygon is high intensity land use — points = (- 2)<br>≤ 50% of 1 km Polygon is high intensity — points = 0 | 0 |
| Total for H 2 — Add the points in the boxes above | 6 |

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

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

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

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

Wetland name or number A/PFO2

# WDFW Priority Habitats

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

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

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

— **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha ) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

X **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

X **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

X **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name or number A/PF02

## CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

Wetland name or number A/PFO2

| | |
|---|---|
| **SC 4.0. Forested Wetlands**<br>Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.***<br>— **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more.<br>— **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm).<br>Yes = **Category I** No = **Not a forested wetland for this section** | **Cat. I** |
| **SC 5.0. Wetlands in Coastal Lagoons**<br>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?<br>— 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<br>— The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)*<br>Yes – Go to **SC 5.1** No = **Not a wetland in a coastal lagoon** | **Cat. I** |
| SC 5.1. Does the wetland meet all of the following three conditions?<br>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100).<br>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.<br>— The wetland is larger than $^{1}/_{10}$ ac (4350 $ft^2$)<br>Yes = **Category I** No = **Category II** | **Cat. II** |
| **SC 6.0. Interdunal Wetlands**<br>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.***<br>In practical terms that means the following geographic areas:<br>— Long Beach Peninsula: Lands west of SR 103<br>— Grayland-Westport: Lands west of SR 105<br>— Ocean Shores-Copalis: Lands west of SR 115 and SR 109<br>Yes – Go to **SC 6.1** No = **not an interdunal wetland for rating** | **Cat I** |
| SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)?<br>Yes = **Category I** No – Go to **SC 6.2** | **Cat. II** |
| SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger?<br>Yes = **Category II** No – Go to **SC 6.3** | **Cat. III** |
| SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac?<br>Yes = **Category III** No = **Category IV** | **Cat. IV** |
| **Category of wetland based on Special Characteristics**<br>If you answered No for all types, enter "Not Applicable" on Summary Form | N/A |


Keys Road Flood Protection

**C.1 Wetland PFO 2 Cowardin Classification**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP
Wetland Data: Natural Systems Design and Ecolution delineation surveys

N

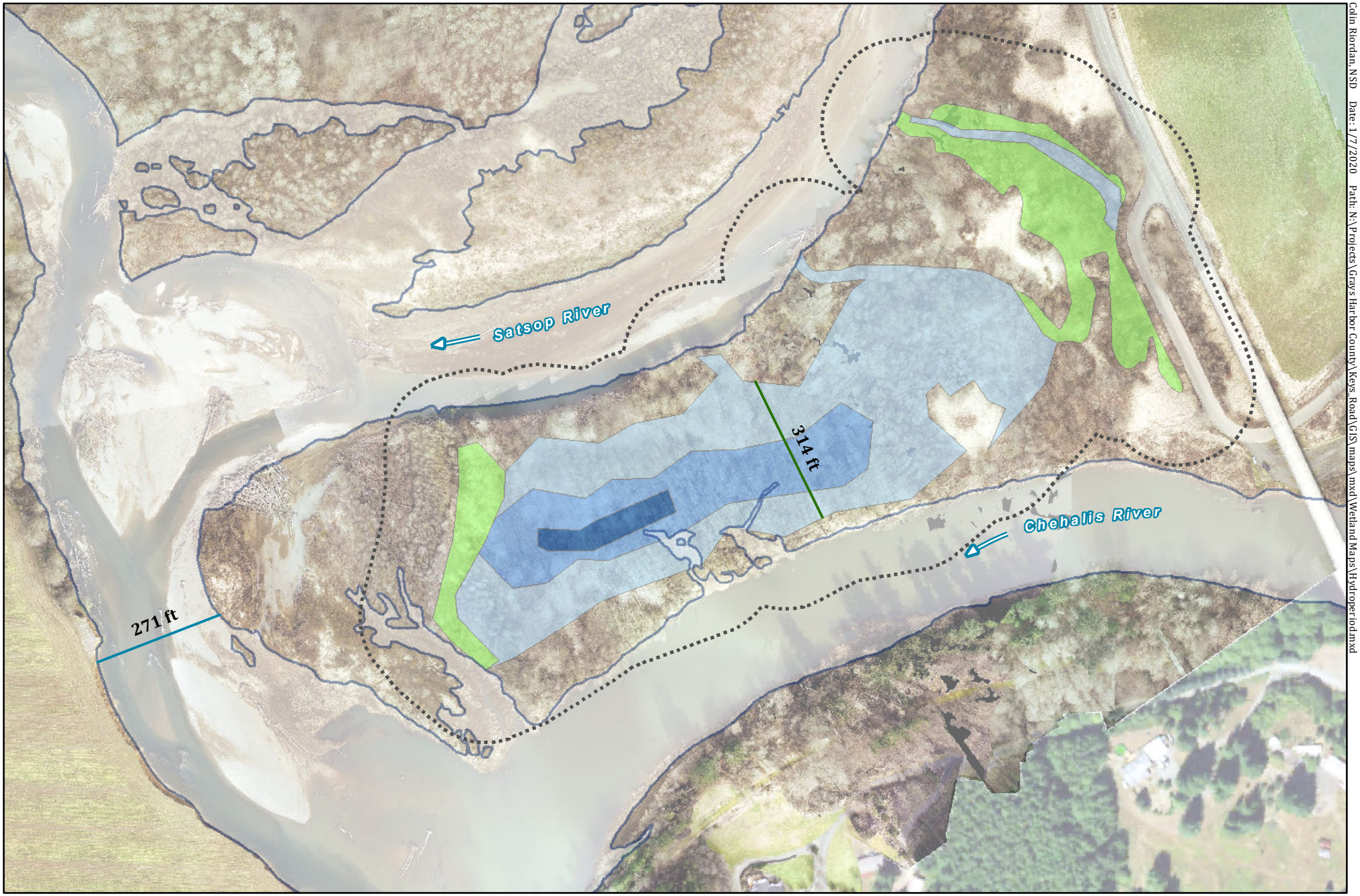
0 100 200 400 Feet

**Vegetation Type**

- Palustrine Emergent
- Palustrine Scrub-shrub
- Palustrine Forested
- Ordinary High Water

Natural Systems Design

Colin Riordan, NSD Date: 11/15/2019 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Wetland Maps\Cowardin.mxd




Keys Road Flood Protection

**C.2 Wetland PFO 2 Hydroperiod**

Aerial Imagery: March 2019 Drone Flight and 2017 USDA NAIP
Wetland Data: Natural Systems Design and Ecolution delineation surveys

N

0 100 200 400 Feet

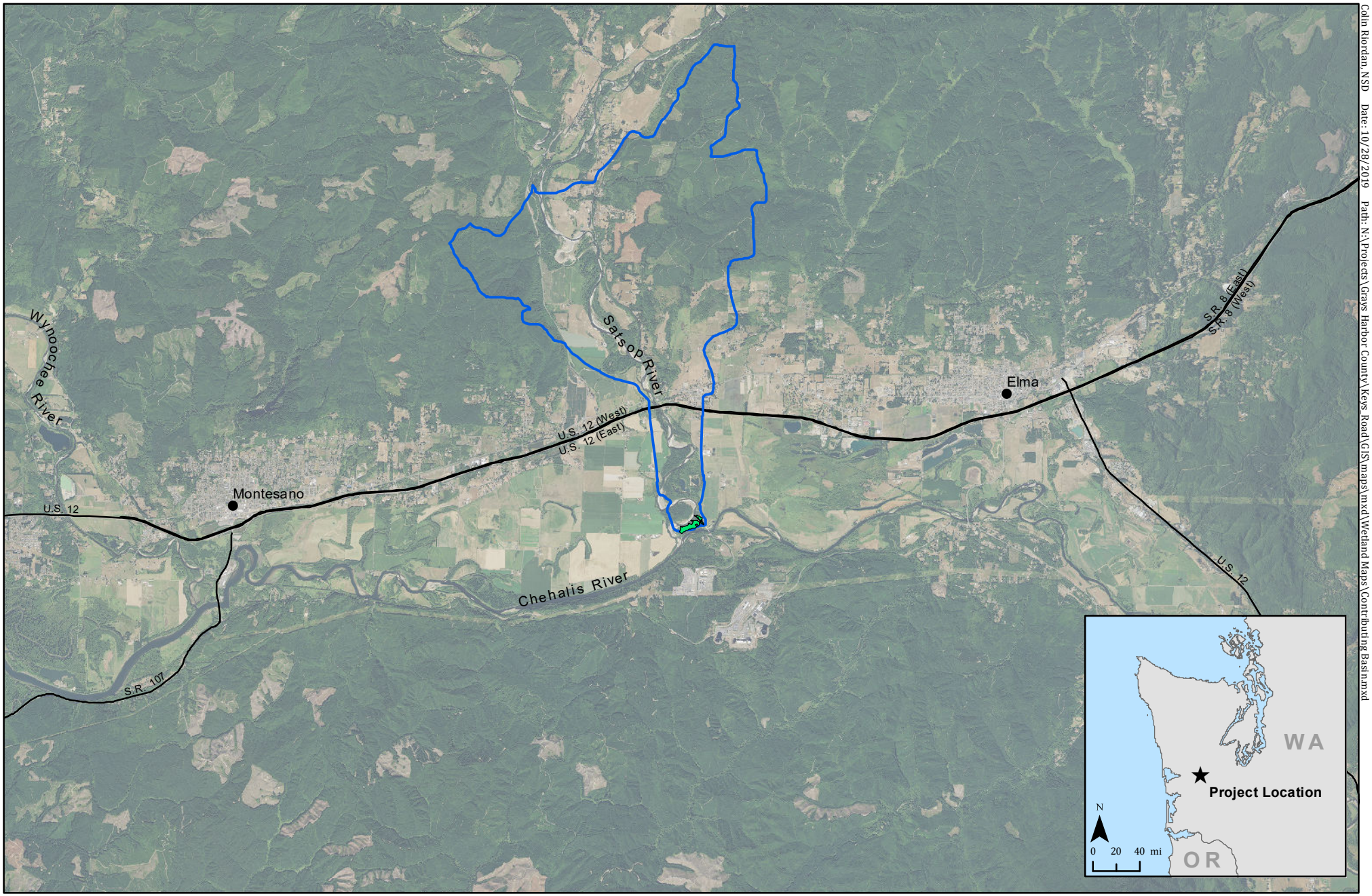
**Hydroperiod**

- Saturated
- Occasionally Flooded
- Seasonally Flooded
- Permanently Flooded

- Wetland Width
- River Width
- 150 ft Buffer
- Ordinary High Water

Natural Systems Design

Colin Riordan, NSD Date: 1/7/2020 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Wetland Maps\Hydroperiod.mxd




Keys Road Flood Protection

**C.3 Wetland Contributing Basin**

Aerial Imagery: 2017 USDA NAIP
Watershed Boundary: National Hydrography Dataset
Roads: Grays Harbor County

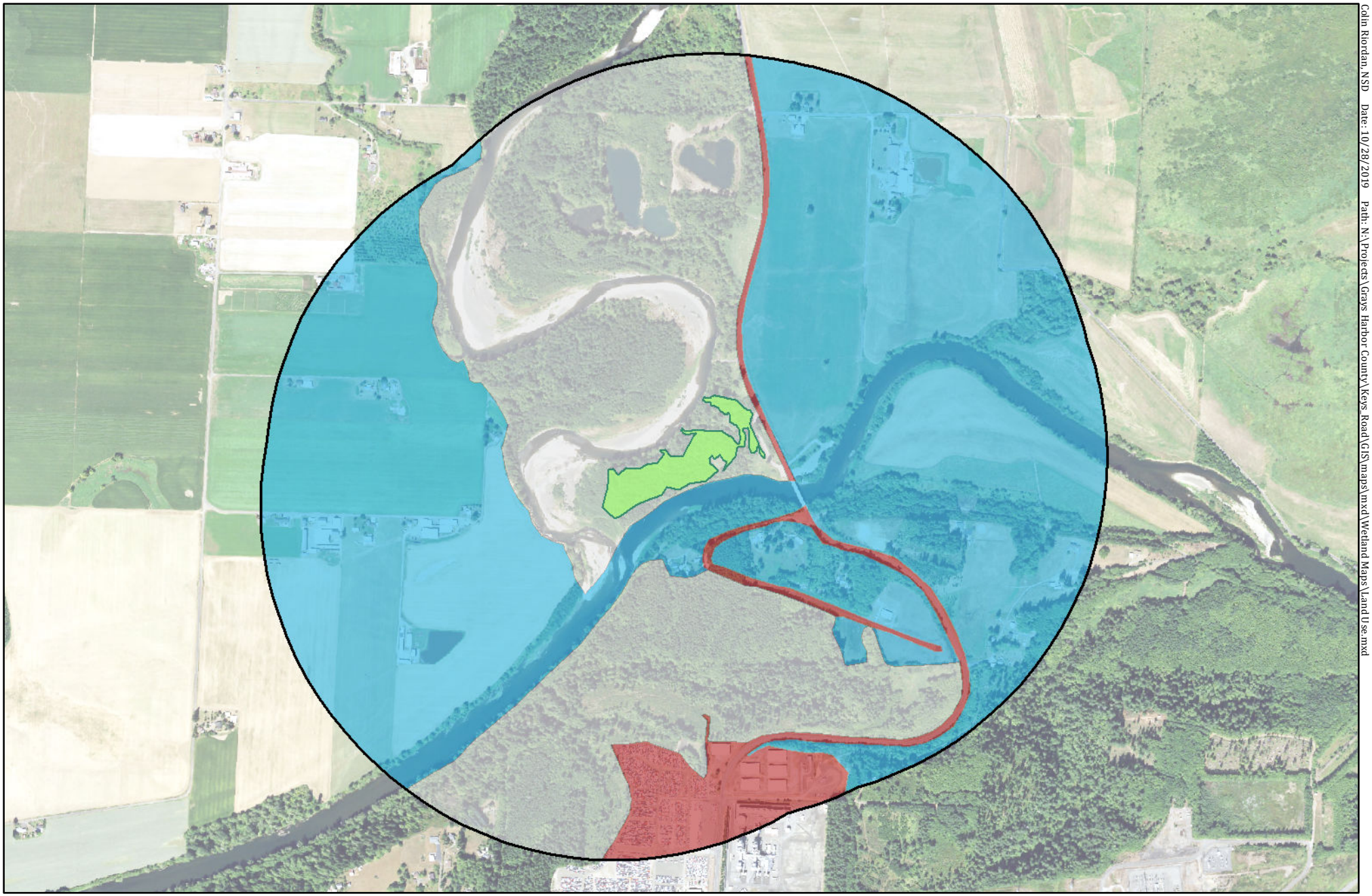
N

0 0.5 1 2 Miles

Wetland PFO 2
Contributing Basin (HUC 12)
Roads
Cities

Natural Systems Design

Colin Riordan, NSD Date: 10/28/2019 Path: N:\Projects\Grays Harbor County\Keys Road\GIS\maps\mxd\Wetland Maps\Contributing Basin.mxd

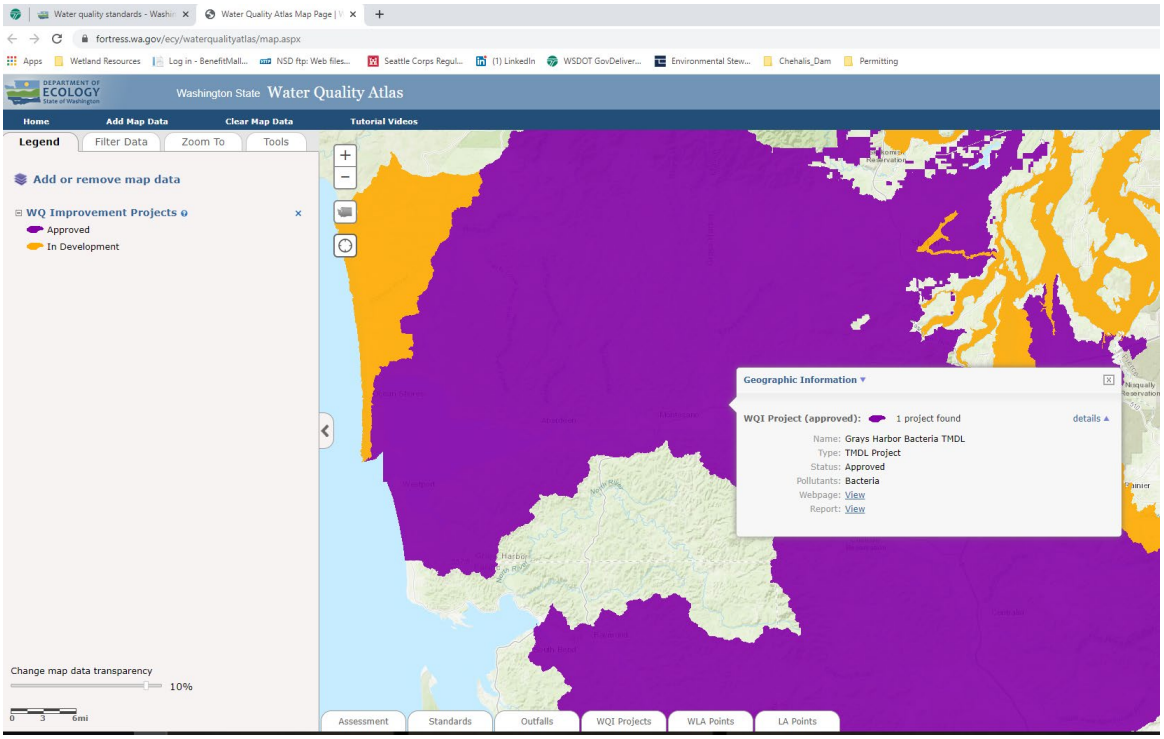



Keys Road Flood Protection

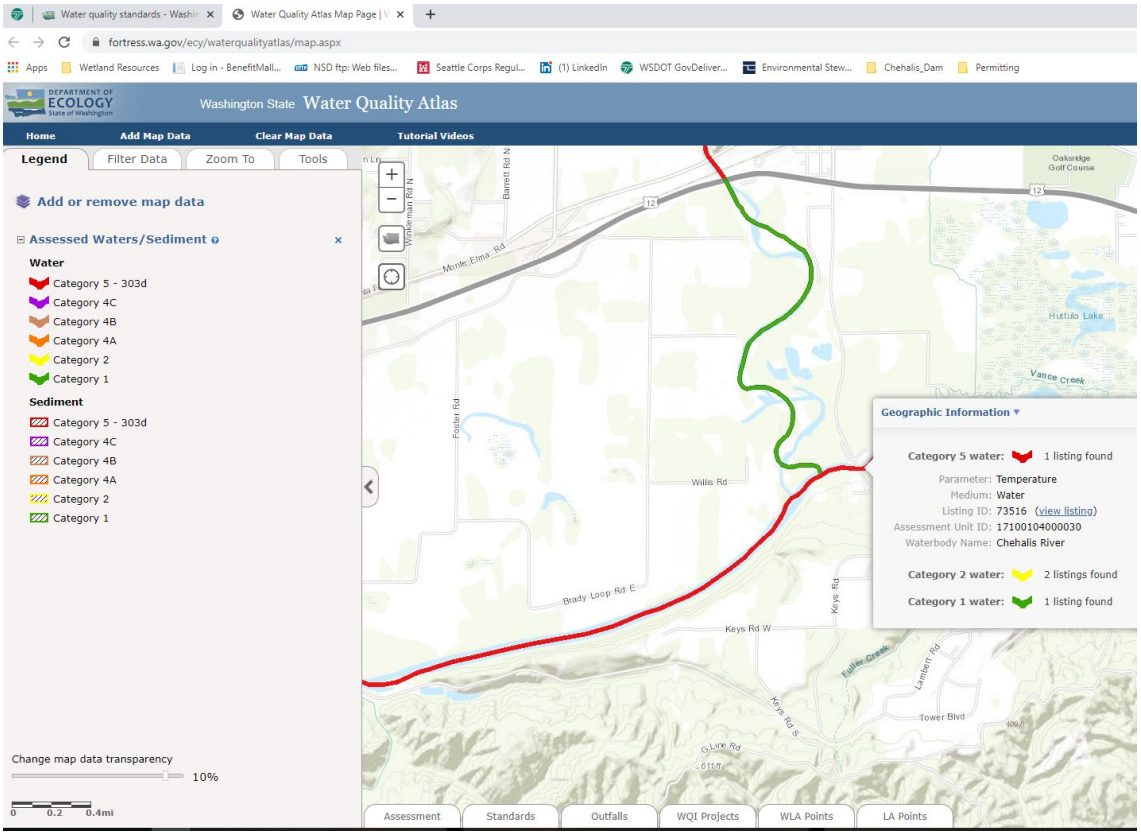
**C.4 Wetland PFO 2 Accessible Habitat and Land Use**

Aerial Imagery: 2017 USDA NAIP Wetland
Data: Natural Systems Design and Ecolution delineation survey

Natural Systems Design




Keys Road study area lies within the Grays Harbor Bacteria TMDL water quality improvement project area.




Lower Satsop River through study area drains to Chehalis River, which is 303(d) listed for temperature.

**Figure C.5 Screen capture of TMDLs for WRIA and 303(d) listings**

checked and corrected 8/21/19 by Torrey Luiting, PWS NSD

# RATING SUMMARY – Western Washington

Name of wetland (or ID #): PFO6 Date of site visit: 1/18/2015

Rated by Marnie Tyler Trained by Ecology? ☑ Yes ☐ No Date of training 12/10/2014

**HGM Class used for rating** Riverine & ~~Fresh Water Tidal~~ Wetland has multiple HGM classes? ☐ Yes ☑ No

**NOTE: Form is not complete with out the figures requested** (*figures can be combined*).
Source of base aerial photo/map Grays Harbor County, 2013 data

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

**1. Category of wetland based on FUNCTIONS**

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

| FUNCTION | Improving Water Quality | Hydrologic | Habitat | |
|---|---|---|---|---|
| | | | *List appropriate rating (H, M, L)* | |
| Site Potential | M | M | H | |
| Landscape Potential | M | M | ~~M~~ H | |
| Value | H | H | H | **Total** |
| **Score Based on Ratings** | 7 | 7 | ~~8~~ 9 | ~~22~~ 23 |

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

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

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

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

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

Depressional Wetlands

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

Riverine Wetlands

| Map of: | To answer questions: | Figure # |
|---|---|---|
| Cowardin plant classes | H 1.1, H 1.4 | 1 |
| Hydroperiods | H 1.2 | 2 |
| Ponded depressions | R 1.1 | 3 |
| Boundary of area within 150 ft of the wetland (*can be added to another figure*) | R 2.4 | 4 |
| Plant cover of trees, shrubs, and herbaceous plants | R 1.2, R 4.2 | 5 |
| Width of unit vs. width of stream (*can be added to another figure*) | R 4.1 | 4 |
| Map of the contributing basin | R 2.2, R 2.3, R 5.2 | 6 |
| 1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat | H 2.1, H 2.2, H 2.3 | 4 |
| Screen capture of map of 303(d) listed waters in basin (from Ecology website) | R 3.1 | 7 |
| Screen capture of list of TMDLs for WRIA in which unit is found (from web) | R 3.2, R 3.3 | 8 |

Lake Fringe Wetlands

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

Slope Wetlands

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

# HGM Classification of Wetland in Western Washington

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:
A berm that was previously used for vehicular traffic and is heavily compacted with rock separates this wetland from PEM5.

## RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

| R 1.0. Does the site have the potential to improve water quality? | | |
|---|---|---|
| R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: | | |
| Depressions cover > 3/4 area of wetland | points = 8 | 2 |
| Depressions cover > ½ area of wetland | points = 4 | |
| Depressions present but cover < ½ area of wetland | points = 2 | |
| No depressions present | points = 0 | |
| R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) | | |
| Trees or shrubs > 2/3 area of the wetland | points = 8 | 8 |
| ☐ Trees or shrubs > 1/3 area of the wetland | points = 6 | |
| ☐ Herbaceous plants (> 6 in high) > 2/3 area of the wetland | points = 6 | |
| Herbaceous plants (> 6 in high) > 1/3 area of the wetland | points = 3 | |
| Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland | points = 0 | |
| Total for R 1 | Add the points in the boxes above | **10** |

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

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

**Rating of Landscape Potential** If score is: ☐ **3 - 6 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

| R 3.0. Is the water quality improvement provided by the site valuable to society? | | |
|---|---|---|
| R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? | Yes = 1 No = 0 | 1 |
| R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? | Yes = 1 No = 0 | 1 |
| R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage in which the unit is found*) | Yes = 2 No = 0 | 2 |
| Total for R 3 | Add the points in the boxes above | **4** |

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

## RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

| R 4.0. Does the site have the potential to reduce flooding and erosion? | | |
|---|---|---|
| R 4.1. Characteristics of the overbank storage the wetland provides:<br>*Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* | | 2 |
| If the ratio is more than 20 | points = 9 | |
| If the ratio is 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 | |
| R 4.2. Characteristics of plants 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. These are NOT Cowardin classes*). | | 7 |
| Forest or shrub for > $^1/_3$ area OR emergent plants > $^2/_3$ area | points = 7 | |
| Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area | points = 4 | |
| Plants do not meet above criteria | points = 0 | |
| Total for R 4 | Add the points in the boxes above | **9** |

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

| R 5.0. Does the landscape have the potential to support the hydrologic functions of the site? | | |
|---|---|---|
| R 5.1. Is the stream or river adjacent to the wetland downcut? | Yes = 0 No = 1 | 0 |
| R 5.2. Does the up-gradient watershed include a UGA or incorporated area? | Yes = 1 No = 0 | 0 |
| R 5.3 Is the up-gradient stream or river controlled by dams? | Yes = 0 No = 1 | 1 |
| Total for R 5 | Add the points in the boxes above | **1** |

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

| R 6.0. Are the hydrologic functions provided by the site valuable to society? | | |
|---|---|---|
| R 6.1. Distance to the nearest areas downstream that have flooding problems?<br>*Choose the description that best fits the site.* | | 2 |
| The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) | points = 2 | |
| Surface flooding problems are in a sub-basin farther down-gradient | points = 1 | |
| No flooding problems anywhere downstream | points = 0 | |
| R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? | Yes = 2 No = 0 | 2 |
| Total for R 6 | Add the points in the boxes above | **4** |

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

**These questions apply to wetlands of all HGM classes.**

**HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat

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

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

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

4 structures or more: points = 4
3 structures: points = 2
2 structures: points - 1
1 structure: points = 0

*If the unit has a Forested class, check if*:

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

**4**

H 1.2. Hydroperiods

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

- ☐ Permanently flooded or inundated
- ☑ Seasonally flooded or inundated
- ☑ Occasionally flooded or inundated
- ☑ Saturated only

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0

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

**3**

H 1.3. Richness of plant species

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

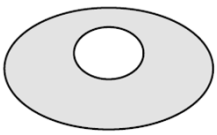
If you counted:
> 19 species — points = 2
5 - 19 species — points = 1
< 5 species — points = 0

**1**

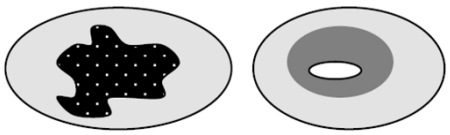
H 1.4. Interspersion of habitats

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

**None** = 0 points

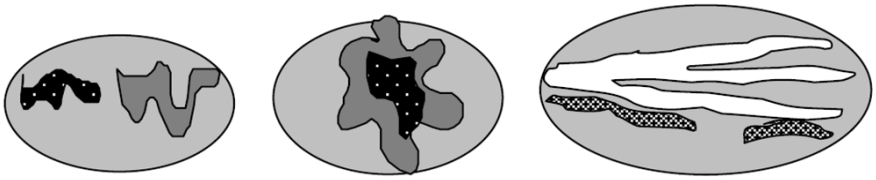


**Low** = 1 point



**Moderate** = 2 points

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



**3**

| | |
|---|---|
| H 1.5. Special habitat features:<br>Check the habitat features that are present in the wetland. *The number of checks is the number of points.*<br>☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long)<br>☑ Standing snags (dbh > 4 in) within the wetland<br>☑ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)<br>☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*)<br>☑ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*)<br>☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*) | 4 |
| Total for H 1 Add the points in the boxes above | **15** |

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

| | |
|---|---|
| H 2.0. Does the landscape have the potential to support the habitat function of the site? | |
| H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*).<br>*Calculate:*<br>_____ % undisturbed habitat + ( _____ % moderate & low intensity land uses / 2 ) =<br><br>If total accessible habitat is:<br>> 1/3 (33.3%) of 1 km Polygon points = 3<br>20 - 33% of 1 km Polygon points = 2<br>10 - 19% of 1 km Polygon points = 1<br>< 10 % of 1 km Polygon points = 0 | 3 |
| H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.<br>*Calculate:*<br>_____ % undisturbed habitat + ( _____ % moderate & low intensity land uses / 2 ) =<br><br>Undisturbed habitat > 50% of Polygon points = 3<br>Undisturbed habitat 10 - 50% and in 1-3 patches points = 2<br>Undisturbed habitat 10 - 50% and > 3 patches points = 1<br>Undisturbed habitat < 10% of 1 km Polygon points = 0 | 2 |
| H 2.3 Land use intensity in 1 km Polygon: If<br>> 50% of 1 km Polygon is high intensity land use points = (-2)<br>≤ 50% of 1km Polygon is high intensity points = 0 | 0 |
| Total for H 2 Add the points in the boxes above | **5** |

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

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

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

# WDFW Priority Habitats

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

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

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

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

# CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

**SC 4.0. Forested Wetlands**

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

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

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

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

**SC 5.0. Wetlands in Coastal Lagoons**

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

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

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

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

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

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

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

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

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

**SC 6.0. Interdunal Wetlands**

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

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

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

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

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

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

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

**Category of wetland based on Special Characteristics**

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

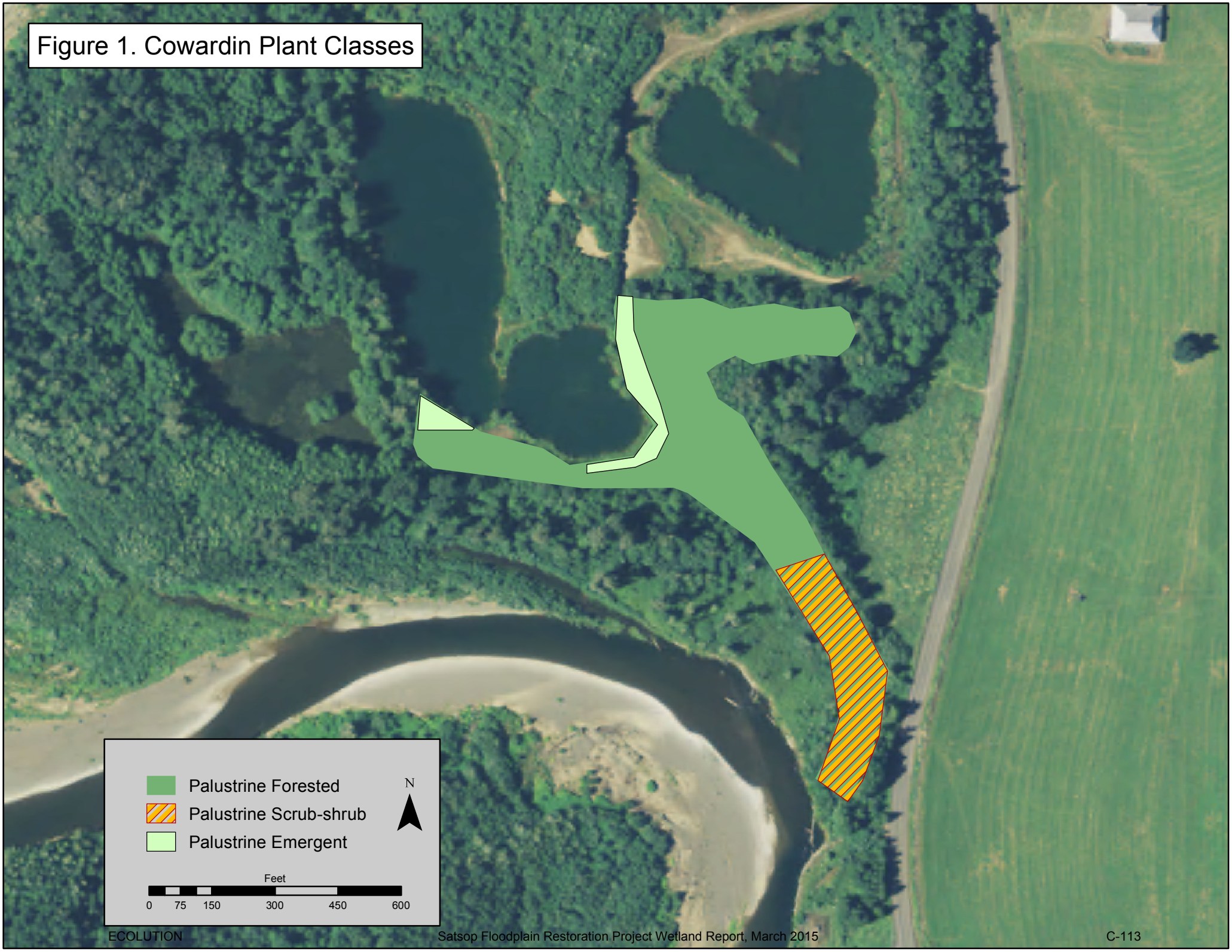


Figure 1. Cowardin Plant Classes
Palustrine Forested
Palustrine Scrub-shrub
Palustrine Emergent
N
Feet
0 75 150 300 450 600
ECOLUTION
Satsop Floodplain Restoration Project Wetland Report, March 2015
C-113

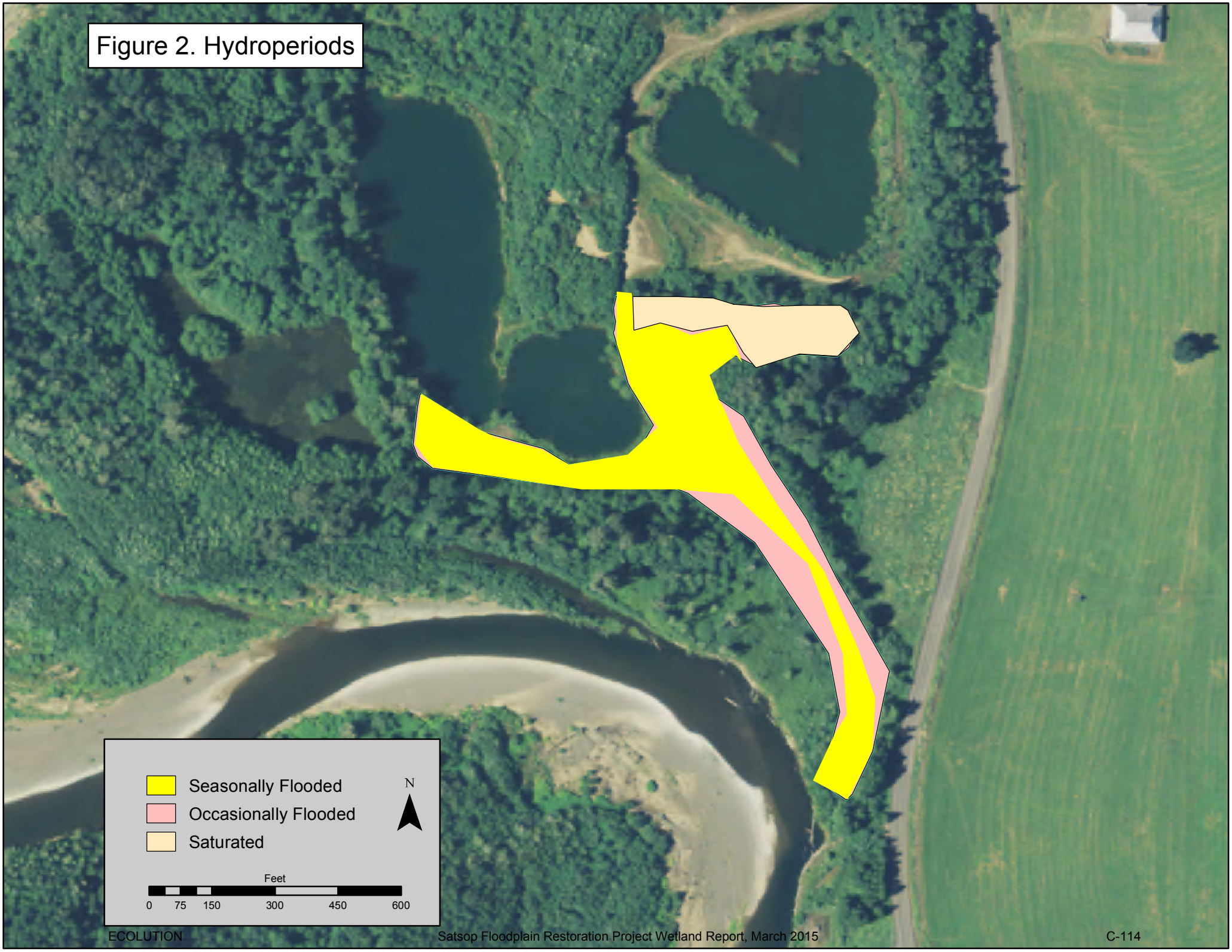


Figure 2. Hydroperiods
Seasonally Flooded
Occasionally Flooded
Saturated
N
Feet
0 75 150 300 450 600

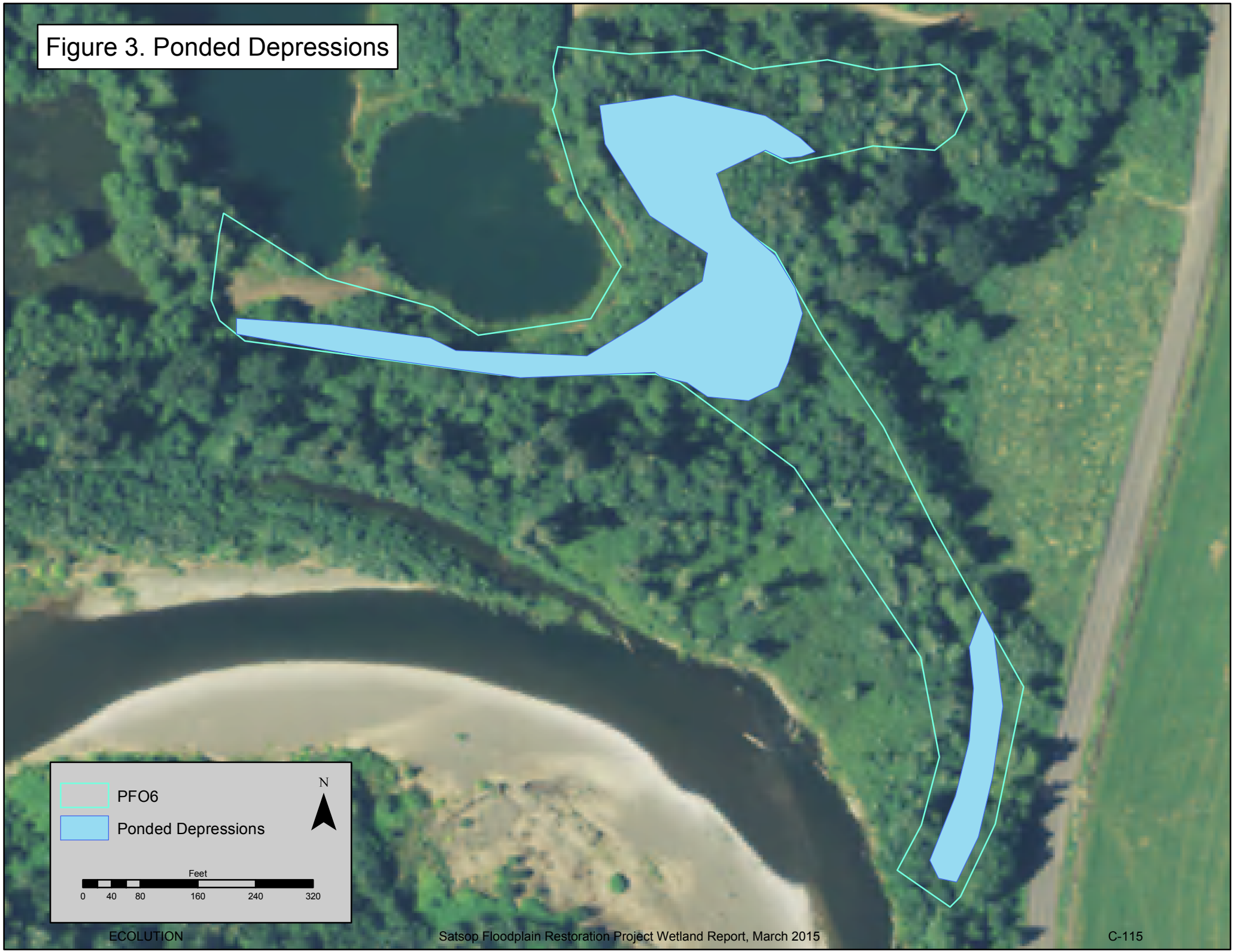


Figure 3. Ponded Depressions
PFO6
Ponded Depressions
N
Feet
0 40 80 160 240 320

Figure 4. Wetland with 150-foot and 1-km Buffer, and Width of River and Wetland

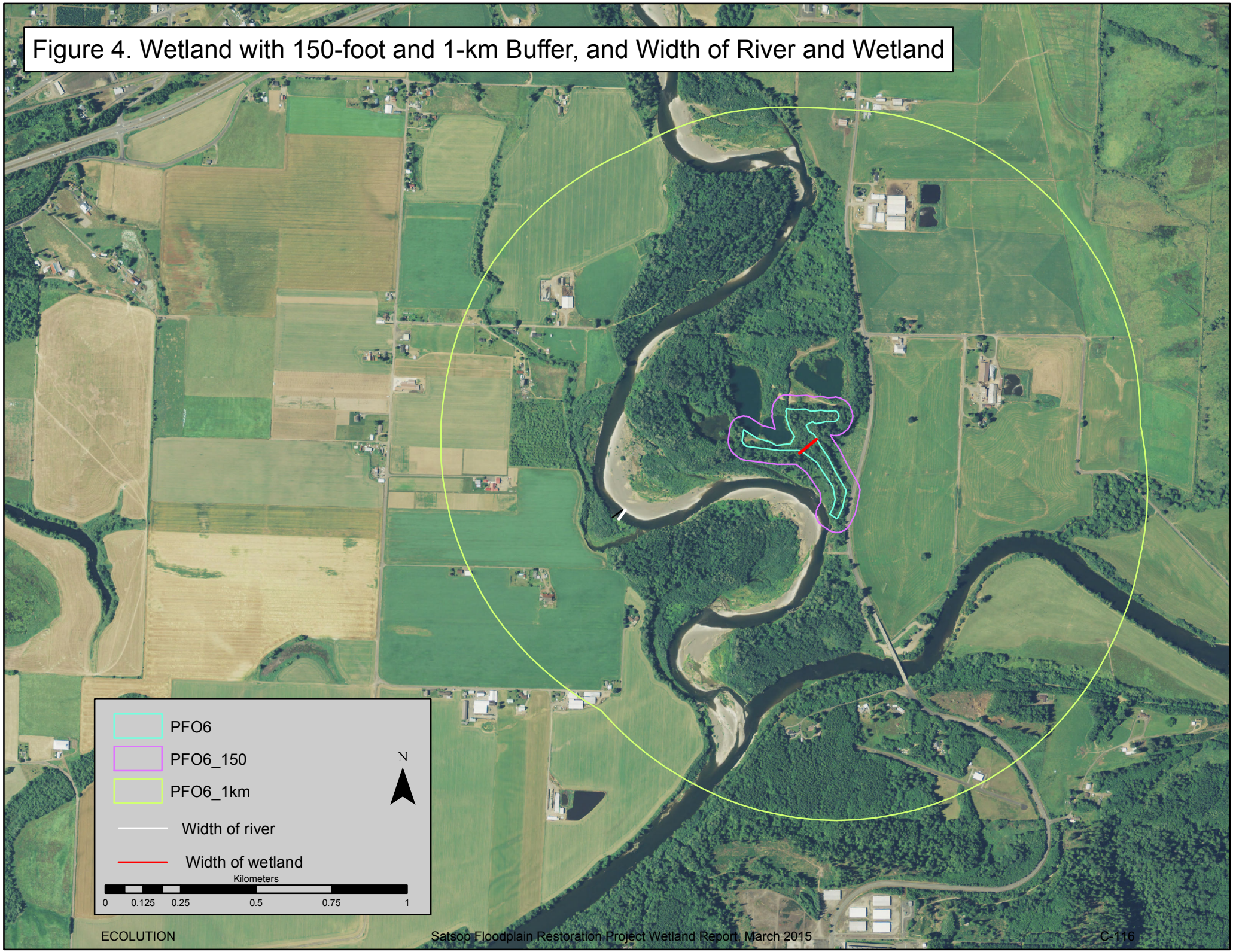



Figure 5. Plant Cover of Trees, Shrubs, and Herbaceous Cover
Forest or Shrub
Ungrazed Emergent
N
Feet
0 75 150 300 450 600
ECOLUTION

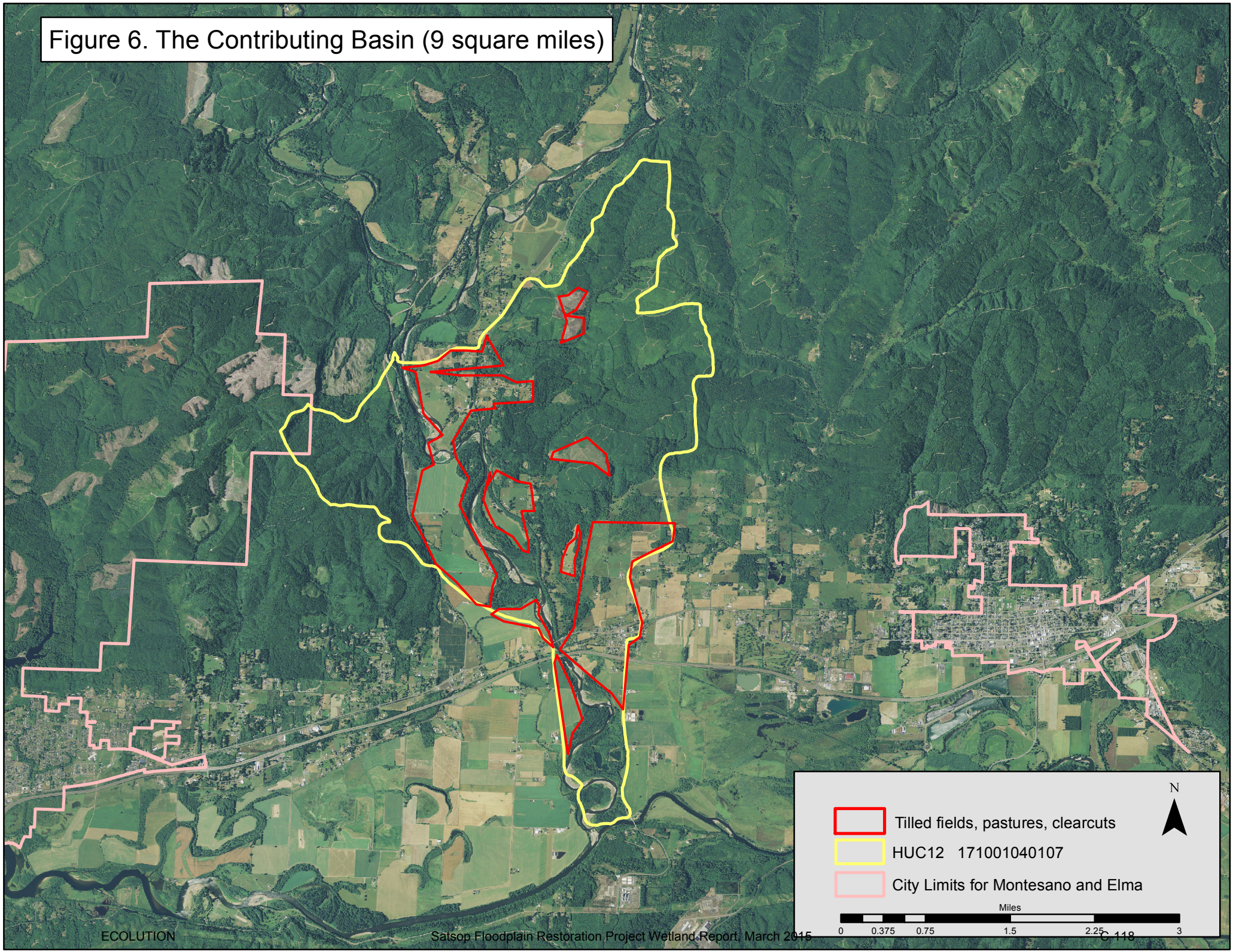


Figure 6. The Contributing Basin (9 square miles)
Tilled fields, pastures, clearcuts
HUC12 171001040107
City Limits for Montesano and Elma
N
Miles
0
0.375
0.75
1.5
2.25
3

Figure 7. 303(d) listed waters in the vicinity of the project. The project area is outlined by a pink box. The project is upstream of a 303(d) listed segment of the Chehalis River.

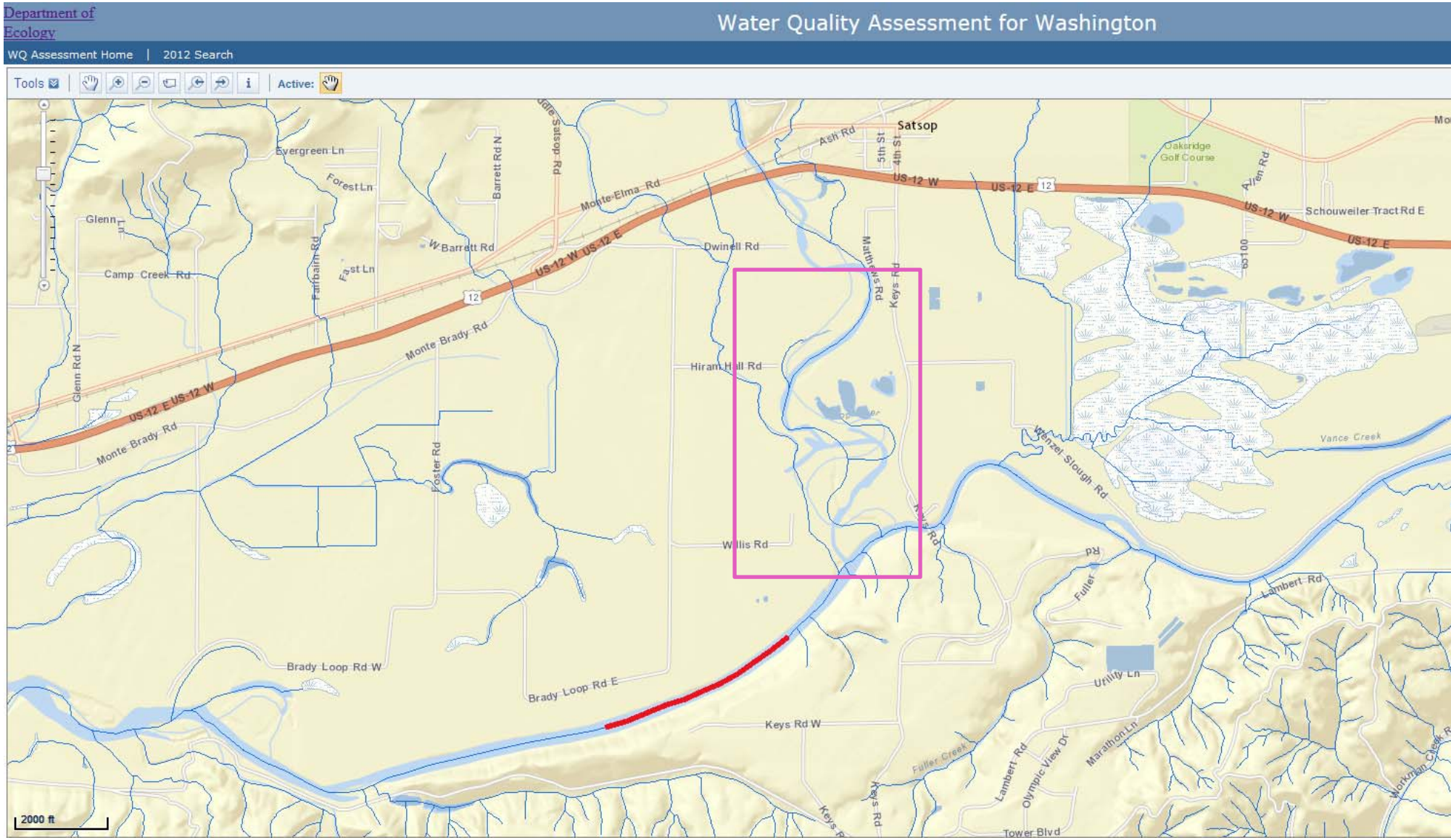
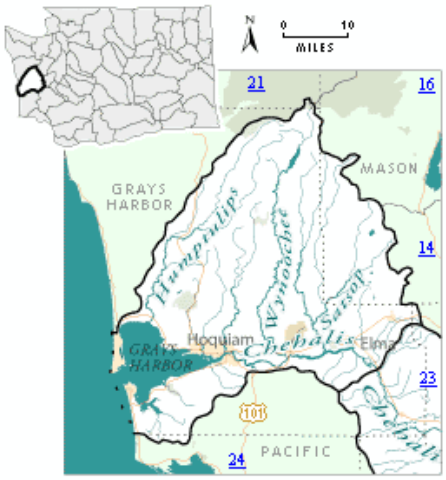


Figure 8. Screen Capture of TMDLs for WRIA 22, Lower Chehalis River, which includes the Satsop River

# Water Quality Improvement Projects (TMDLs)

Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 22: Lower Chehalis

## WRIA 22: Lower Chehalis




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

For general information about water quality improvement projects in the Chehalis River basin please visit www.ecy.wa.gov/programs/wq/tmdl/ChehalisIndex.html.

**Counties**

- Grays Harbor
- Mason
- Pacific

| Waterbody Name | Pollutant(s) | Status** | TMDL Lead |
|---|---|---|---|
| Grays Harbor | Dioxin<br>Fecal Coliform | Approved | Dustin Bilhimer<br>360-407-6726 |
| Humptulips River | Temperature | Approved | Dustin Bilhimer<br>360-407-6726 |
| Simpson Timberlands<br>Tributaries:<br>• Rabbit Creek<br>• Wildcat Creek | Temperature | Approved | Charles Toal<br>360-407-6297 |
| Wildcat Creek | Ammonia-N<br>BOD (5-Day)<br>Chlorine<br>Fecal Coliform | Approved | Charles Toal<br>360-407-6297 |

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

**For more information about WRIA 22:**

- Waterbodies in WRIA 22 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 22

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Last updated April 2014

updated 8/21/19 by Torrey Luiting, PWS NSD

# RATING SUMMARY – Western Washington

Name of wetland (or ID #): PFO8 Date of site visit: 2/1/2015

Rated by Marnie Tyler Trained by Ecology? ☑ Yes ☐ No Date of training 12/10/2014

**HGM Class used for rating** Riverine ~~& Fresh Water Tidal~~ Wetland has multiple HGM classes? ☐ Yes ☑ No

**NOTE: Form is not complete with out the figures requested** (*figures can be combined*).
Source of base aerial photo/map Grays Harbor County, 2013 data

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

## 1. Category of wetland based on FUNCTIONS

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

| FUNCTION | Improving Water Quality | Hydrologic | Habitat | |
|---|---|---|---|---|
| | | | *List appropriate rating (H, M, L)* | |
| Site Potential | M | M | M | |
| Landscape Potential | M | M | ~~M~~ H | |
| Value | H | H | H | **Total** |
| **Score Based on Ratings** | 7 | 7 | 8 | **22** |

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

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

## 2. Category based on SPECIAL CHARACTERISTICS of wetland

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

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

Depressional Wetlands

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

Riverine Wetlands

| Map of: | To answer questions: | Figure # |
|---|---|---|
| Cowardin plant classes | H 1.1, H 1.4 | 1 |
| Hydroperiods | H 1.2 | 2 |
| Ponded depressions | R 1.1 | 3 |
| Boundary of area within 150 ft of the wetland (*can be added to another figure*) | R 2.4 | 4 |
| Plant cover of trees, shrubs, and herbaceous plants | R 1.2, R 4.2 | 5 |
| Width of unit vs. width of stream (*can be added to another figure*) | R 4.1 | 4 |
| Map of the contributing basin | R 2.2, R 2.3, R 5.2 | 6 |
| 1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat | H 2.1, H 2.2, H 2.3 | 4 |
| Screen capture of map of 303(d) listed waters in basin (from Ecology website) | R 3.1 | 7 |
| Screen capture of list of TMDLs for WRIA in which unit is found (from web) | R 3.2, R 3.3 | 8 |

Lake Fringe Wetlands

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

Slope Wetlands

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

# HGM Classification of Wetland in Western Washington

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

NOTES and FIELD OBSERVATIONS:

## RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

| | | |
|---|---|---|
| R 1.0. Does the site have the potential to improve water quality? | | |
| R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event: | | 2 |
| Depressions cover > 3/4 area of wetland | points = 8 | |
| Depressions cover > ½ area of wetland | points = 4 | |
| Depressions present but cover < ½ area of wetland | points = 2 | |
| No depressions present | points = 0 | |
| R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, **not** Cowardin classes) | | 8 |
| Trees or shrubs > 2/3 area of the wetland | points = 8 | |
| ☐ Trees or shrubs > 1/3 area of the wetland | points = 6 | |
| ☐ Herbaceous plants (> 6 in high) > 2/3 area of the wetland | points = 6 | |
| Herbaceous plants (> 6 in high) > 1/3 area of the wetland | points = 3 | |
| Trees, shrubs, and ungrazed herbaceous < 1/3 area of the wetland | points = 0 | |
| Total for R 1 | Add the points in the boxes above | **10** |

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

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

**Rating of Landscape Potential** If score is: ☐ **3 - 6 = H** ☑ **1 or 2 = M** ☐ **0 = L** *Record the rating on the first page*

| | | |
|---|---|---|
| R 3.0. Is the water quality improvement provided by the site valuable to society? | | |
| R 3.1. Is the wetland along a stream or river that is on the 303(d) list or on a tributary that drains to one within 1 mi? | Yes = 1 No = 0 | 1 |
| R 3.2. Is the wetland along a stream or river that has TMDL limits for nutrients, toxics, or pathogens? | Yes = 1 No = 0 | 1 |
| R 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? (*answer YES if there is a TMDL for the drainage in which the unit is found*) | Yes = 2 No = 0 | 2 |
| Total for R 3 | Add the points in the boxes above | **4** |

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

## RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

| | | |
|---|---|---|
| R 4.0. Does the site have the potential to reduce flooding and erosion? | | |
| R 4.1. Characteristics of the overbank storage the wetland provides:<br>*Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).* | | 1 |
| If the ratio is more than 20 | points = 9 | |
| If the ratio is 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 | |
| R 4.2. Characteristics of plants 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. These are NOT Cowardin classes).* | | 7 |
| Forest or shrub for > $^1/_3$ area OR emergent plants > $^2/_3$ area | points = 7 | |
| Forest or shrub for > $^1/_{10}$ area OR emergent plants > $^1/_3$ area | points = 4 | |
| Plants do not meet above criteria | points = 0 | |
| Total for R 4 | Add the points in the boxes above | **8** |

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

| | | |
|---|---|---|
| R 5.0. Does the landscape have the potential to support the hydrologic functions of the site? | | |
| R 5.1. Is the stream or river adjacent to the wetland downcut? | Yes = 0 No = 1 | 1 |
| R 5.2. Does the up-gradient watershed include a UGA or incorporated area? | Yes = 1 No = 0 | 0 |
| R 5.3 Is the up-gradient stream or river controlled by dams? | Yes = 0 No = 1 | 1 |
| Total for R 5 | Add the points in the boxes above | **2** |

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

| | | |
|---|---|---|
| R 6.0. Are the hydrologic functions provided by the site valuable to society? | | |
| R 6.1. Distance to the nearest areas downstream that have flooding problems?<br>*Choose the description that best fits the site.* | | 2 |
| The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) | points = 2 | |
| Surface flooding problems are in a sub-basin farther down-gradient | points = 1 | |
| No flooding problems anywhere downstream | points = 0 | |
| R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? | Yes = 2 No = 0 | 2 |
| Total for R 6 | Add the points in the boxes above | **4** |

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

**These questions apply to wetlands of all HGM classes.**

**HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat

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

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

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

4 structures or more: points = 4
3 structures: points = 2
2 structures: points - 1
1 structure: points = 0

*If the unit has a Forested class, check if*:

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

4

H 1.2. Hydroperiods

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

- ☐ Permanently flooded or inundated
- ☒ Seasonally flooded or inundated
- ☑ Occasionally flooded or inundated
- ☐ Saturated only

4 or more types present: points = 3
3 types present: points = 2
2 types present: points = 1
1 types present: points = 0

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

1

H 1.3. Richness of plant species

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

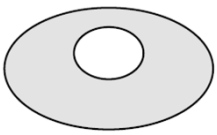
If you counted:
> 19 species — points = 2
5 - 19 species — points = 1
< 5 species — points = 0

1

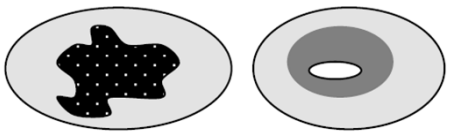
H 1.4. Interspersion of habitats

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

**None** = 0 points

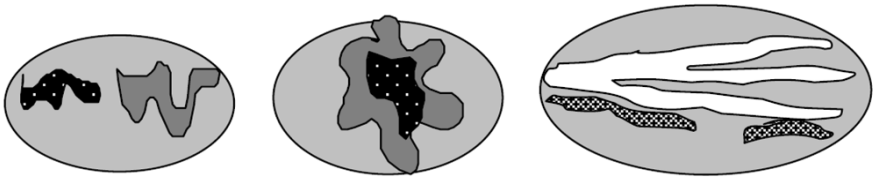


**Low** = 1 point



**Moderate** = 2 points

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



3

| | |
|---|---|
| H 1.5. Special habitat features:<br>Check the habitat features that are present in the wetland. *The number of checks is the number of points.*<br>☑ Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long)<br>☑ Standing snags (dbh > 4 in) within the wetland<br>☑ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)<br>☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (*cut shrubs or trees that have not yet weathered where wood is exposed*)<br>☐ At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (*structures for egg-laying by amphibians*)<br>☐ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*) | 3 |
| Total for H 1 — Add the points in the boxes above | **12** |

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

| | |
|---|---|
| H 2.0. Does the landscape have the potential to support the habitat function of the site? | |
| H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*).<br>*Calculate:*<br>____ % undisturbed habitat + ( ____ % moderate & low intensity land uses / 2 ) =<br><br>If total accessible habitat is:<br>> 1/3 (33.3%) of 1 km Polygon — points = 3<br>20 - 33% of 1 km Polygon — points = 2<br>10 - 19% of 1 km Polygon — points = 1<br>< 10 % of 1 km Polygon — points = 0 | 2 |
| H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.<br>*Calculate:*<br>____ % undisturbed habitat + ( ____ % moderate & low intensity land uses / 2 ) =<br><br>Undisturbed habitat > 50% of Polygon — points = 3<br>Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2<br>Undisturbed habitat 10 - 50% and > 3 patches — points = 1<br>Undisturbed habitat < 10% of 1 km Polygon — points = 0 | 2 |
| H 2.3 Land use intensity in 1 km Polygon: If<br>> 50% of 1 km Polygon is high intensity land use — points = (-2)<br>≤ 50% of 1km Polygon is high intensity — points = 0 | -2 |
| Total for H 2 — Add the points in the boxes above | 14 |

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

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

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

# WDFW Priority Habitats

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

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

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

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

# CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

**SC 4.0. Forested Wetlands**

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

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

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

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

**SC 5.0. Wetlands in Coastal Lagoons**

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

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

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

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

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

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

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

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

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

**SC 6.0. Interdunal Wetlands**

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

In practical terms that means the following geographic areas:

☐ Long Beach Peninsula: Lands west of SR 103

☐ Grayland-Westport: Lands west of SR 105

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

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

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

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

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

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

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

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

**Category of wetland based on Special Characteristics**

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


Figure 1. Cowardin Plant Classes
Palustrine Emergent
Palustrine Scrub-shrub
Palustrine Forested
N
Feet
0 35 70 140 210 280


Figure 2. Hydroperiods
Seasonally Inundated
Occasionally Inundated
Culvert
N
Feet
0
35
70
140
210
280

# Figure 3. Ponded Depressions

Figure 4. Wetland with 150-foot and 1-km Buffer, and Width of River and Wetland

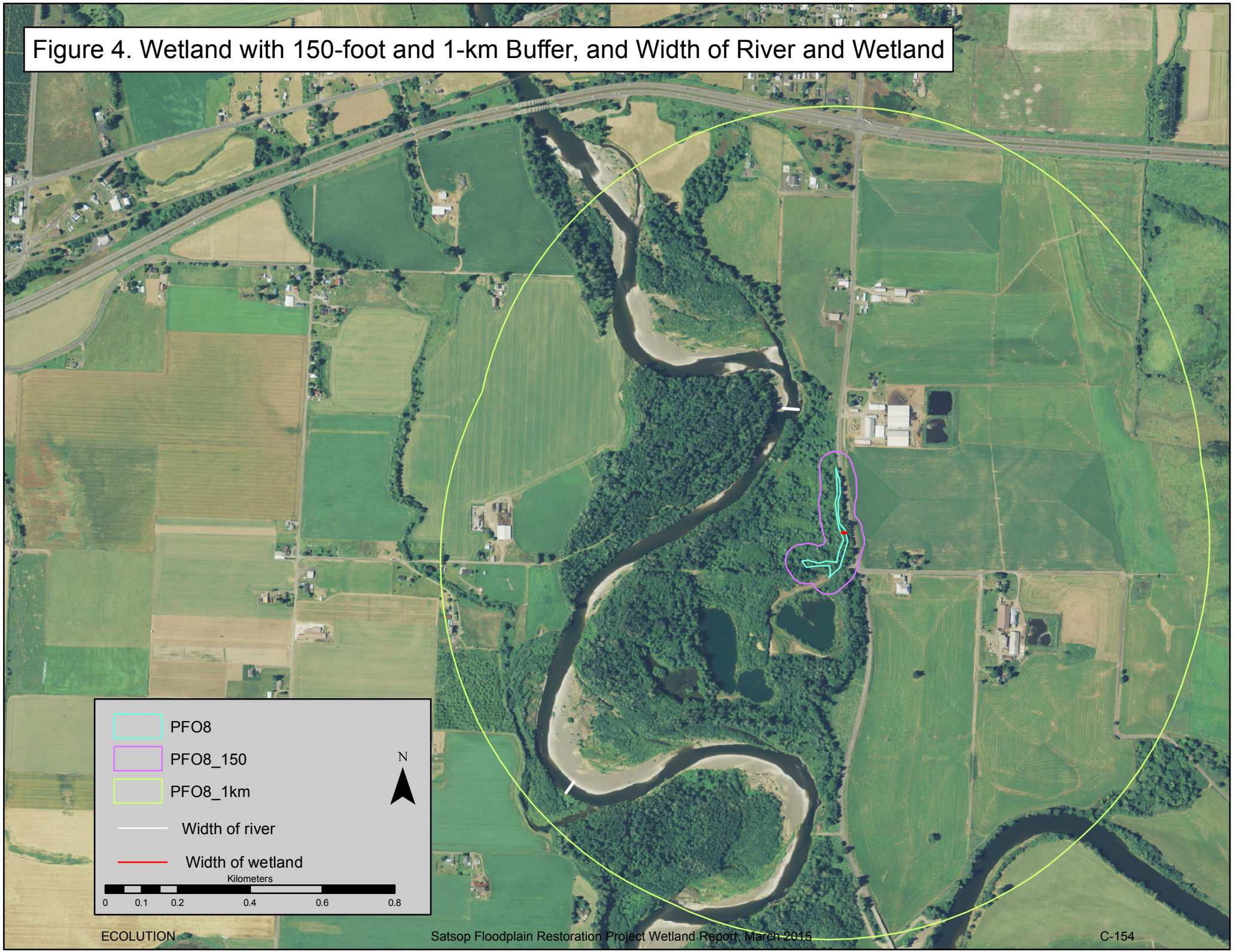



Figure 5. Plant Cover of Trees, Shrubs, and Herbaceous Cover
Ungrazed Emergent
Forest and Shrub
N
Feet
0 35 70 140 210 280
ECOLUTION
Satsop Floodplain Restoration Project Wetland Report, March 2015
C-155

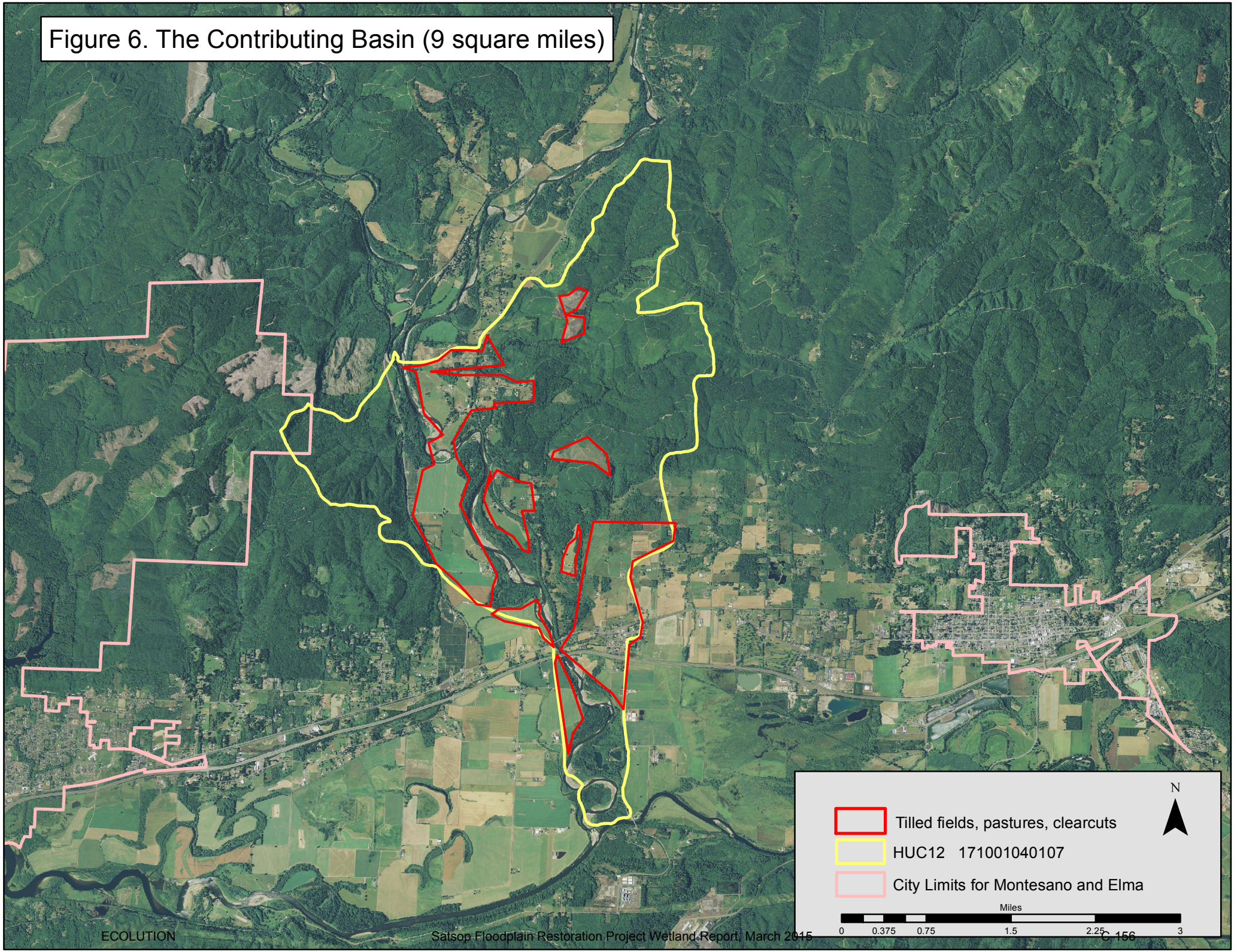


Figure 6. The Contributing Basin (9 square miles)
Tilled fields, pastures, clearcuts
HUC12 171001040107
City Limits for Montesano and Elma
N
Miles
0
0.375
0.75
1.5
2.25
3

Figure 7. 303(d) listed waters in the vicinity of the project. The project area is outlined by a pink box. The project is upstream of a 303(d) listed segment of the Chehalis River.

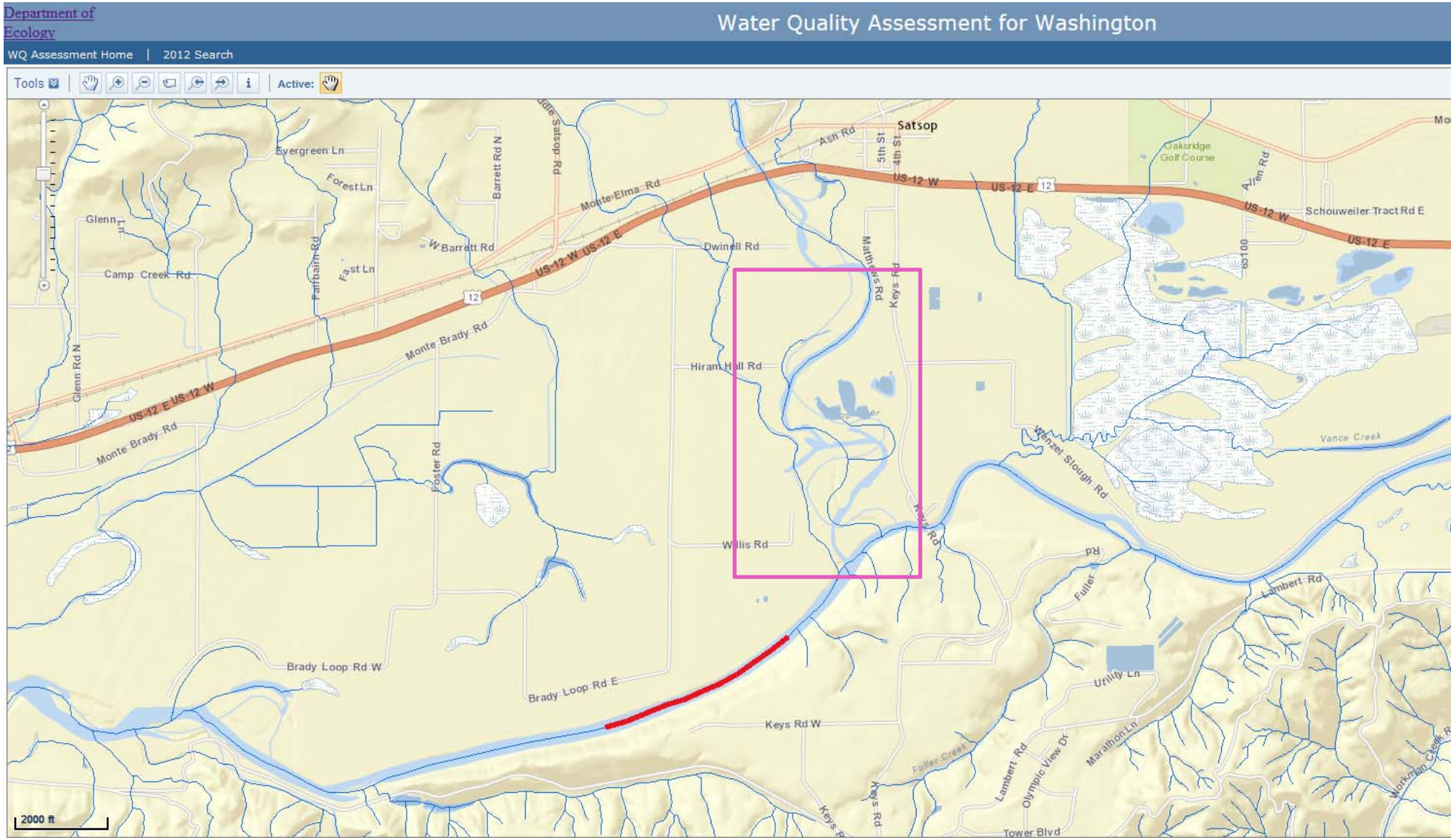
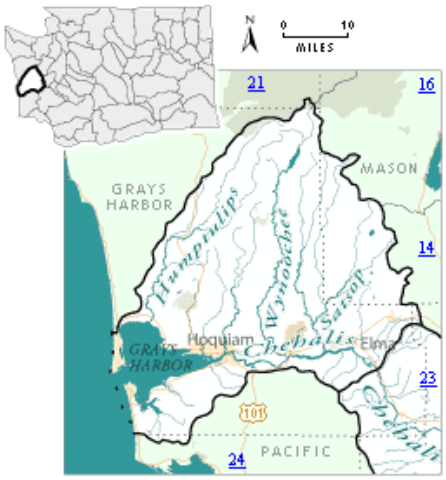


Figure 8. Screen Capture of TMDLs for WRIA 22, Lower Chehalis River, which includes the Satsop River

# Water Quality Improvement Projects (TMDLs)

Water Quality Improvement > Water Quality Improvement Projects by WRIA > WRIA 22: Lower Chehalis

## WRIA 22: Lower Chehalis




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

For general information about water quality improvement projects in the Chehalis River basin please visit www.ecy.wa.gov/programs/wq/tmdl/ChehalisIndex.html.

**Counties**

- Grays Harbor
- Mason
- Pacific

| Waterbody Name | Pollutant(s) | Status** | TMDL Lead |
|---|---|---|---|
| Grays Harbor | Dioxin<br>Fecal Coliform | Approved | Dustin Bilhimer<br>360-407-6726 |
| Humptulips River | Temperature | Approved | Dustin Bilhimer<br>360-407-6726 |
| Simpson Timberlands<br>Tributaries:<br>• Rabbit Creek<br>• Wildcat Creek | Temperature | Approved | Charles Toal<br>360-407-6297 |
| Wildcat Creek | Ammonia-N<br>BOD (5-Day)<br>Chlorine<br>Fecal Coliform | Approved | Charles Toal<br>360-407-6297 |

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

**For more information about WRIA 22:**

- Waterbodies in WRIA 22 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 22

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Last updated April 2014

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# Appendix D

## Keys Road Flood Protection Project Area
## Photographs, August 21, 2019

Natural Systems Design

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**Appendix D – Keys Road Flood Protection – Wetland Critical Area Report, August 21, 2019 Photos**

**Photo 1. Higher elevation upland, sample plot 1, adjacent to northern extent of Wetland PFO8.**

**Photo 2. Sample plot 2, at northern end of narrow tip of Wetland PFO8.**


**Photo 3. Dense Japanese knotweed in upland west of Wetland PFO8.**

**Photo 4. Sample plot 4, upland forest with dense snowberry, blackberry, knotweed understory to west of Wetland PFO8**

**Photo 5. Grazed field at north end of RM 1.5 portion of the study area; upland forest and blackberry/knotweed patches in background.**

**Photo 6. Area of sample plot 5 in grazed upland pasture swale.**

**Photo 7. Sample plot 15 in grazed upland pasture swale at RM 1.5 portion of study area**

**Photo 8. Edge of disturbed upland depression near sample plot 6.**

**Photo 9. Less disturbed upland terrace at sample plot 7; shrubby thicket dominated by red-osier dogwood and snowberry with sandy soils.**

**Photo 10. View downstream of eroded left bank of Satsop River at RM 1.5 with forested upland in background.**

**Photo 11. View upstream of eroded left bank at RM 1.5.**

**Photo 12. Sample plot 8 near south end of Wetland PFO6, alder and willow along dense reed canarygrass depression; appears Satsop River contribute surface water to southern end of wetland at high flows.**

**Photo 13. Upland forested area adjacent to eastern side of Wetland PFO6.**

**Photo 14. Outer edge of depression that forms NSD delineated northern lobe of Wetland PFO2; just north of sample plot 10.**

**Photo 15. Upland forested area at sample plot 11, adjacent to eastern side of NSD delineated northern lobe of Wetland PFO2**

**Photo 16. Northern edge of NSD delineated northern lobe of Wetland PFO2 along edge of topographic swale.**

**Photo 17. Western end of NSD delineated northern lobe of Wetland PFO2, facing east into wetland depression; appears Satsop River contribute surface water to wetland at high flows.**

**Photo 18. Sample plot 12 in reed canarygrass upland north of NSD delineated northern lobe of Wetland PFO2**

**Photo 19. Sample plot 13 bright soils in reed canarygrass area south of Port's well.**

**Photo 20. Sample plot 14 bright soils in forested willow area south of Port's well.**