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CITY OF MONROE



## Chain Lake Road CRITICAL AREAS STUDY

*Prepared for:*

**Michael Suschik**  
September 3, 2019



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# Chain Lake Road CRITICAL AREAS STUDY

Prepared for:

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September 3, 2019

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# TABLE OF CONTENTS

1.0	INTRODUCTION .....	1
2.0	METHODS .....	1
2.1	Desktop Analysis .....	1
2.2	Wetlands .....	3
3.0	RESULTS .....	3
3.1	General Site Description .....	3
3.2	Test Plots .....	4
3.3	Wetlands .....	7
4.0	REGULATORY IMPLICATIONS .....	8
5.0	PROPOSED DEVELOPMENT .....	10
6.0	REASONABLE USE CRITERIA .....	10
7.0	IMPACT ASSESSMENT AND MITIGATION .....	11
8.0	REFERENCES .....	14

## TABLES

Table 1.	Wetland Summary .....	8
Table 2.	Bank Functions Relevant to Lost Functions .....	12

## FIGURES

Figure 1.	Project Area .....	2
Figure 2.	Test Plots and Wetland Boundary .....	5
Figure 3.	Wetland Buffer .....	9
Figure 4.	Proposed Development Footprint and Wetland Buffer Impacts .....	13

## APPENDICES

- Appendix A - GIS Database Search Results
- Appendix B - Delineation Methods
- Appendix C - Wetland Delineation Data Forms
- Appendix D - Wetland Rating Forms
- Appendix E - Site Photographs

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## 1.0 INTRODUCTION

On January 22, 2018, Confluence Environmental Company (Confluence) conducted a site visit at the property just west of 13304 Chain Lake Road, Monroe, Washington (tax parcel 28073100200200) (Figure 1). The purpose of the site visit was to determine the presence and extent of critical areas on and adjacent to the property. The effort focused on wetlands. Critical areas such as erosion hazard areas, steep slopes, and landslide hazard areas were not evaluated in this study. This report discusses the results of the site visit, the proposed development of the property, proposed mitigation, and a request for reasonable use, as allowed under Monroe Municipal Code (MMC).

The site is currently undeveloped and consists of mainly lawn and reed canarygrass (*Phalaris arundinacea*). The neighboring parcels to the east and west are both single-family residential properties.

## 2.0 METHODS

Confluence conducted a wetland delineation on the property. This section describes the methods used to identify the presence or absence of wetlands and delineate the wetland boundary.

### 2.1 Desktop Analysis

Confluence evaluated the parcel for the presence of critical areas using available GIS databases. The following databases were reviewed:

- City of Monroe (City of Monroe 2008),
- Snohomish County (Snohomish County 2018),
- National Wetland Inventory (NWI) (USFWS 1981),
- Soil Survey (USDA NRCS 2018a),
- SalmonScape (WDFW 2018a),
- Priority Habitat and Species (WDFW 2018b),
- Department of Natural Resources Water Type GIS (DNR 2018).

Results of the GIS database searches are in Appendix A.

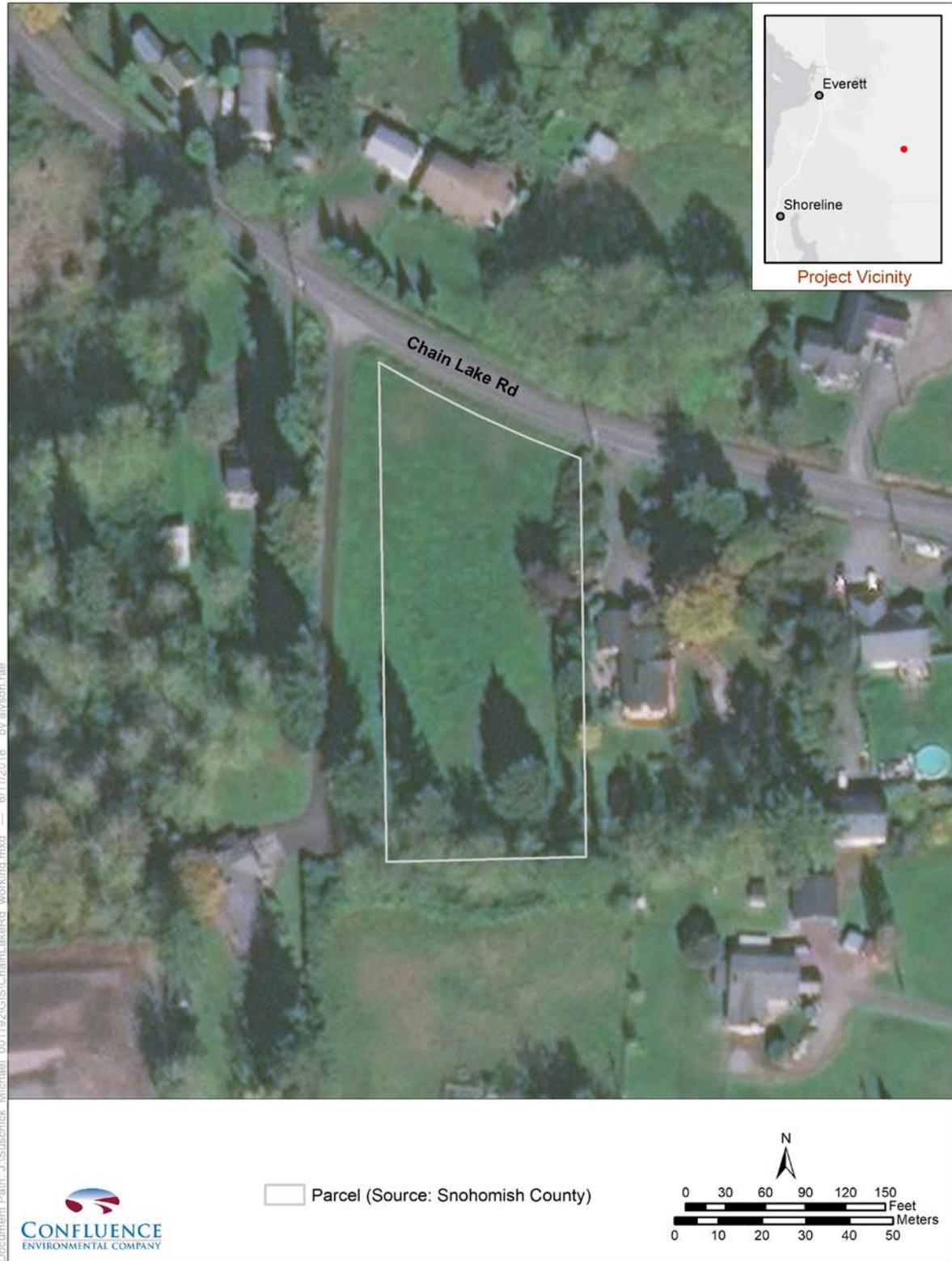


Figure 1. Project Area

## 2.2 Wetlands

### 2.2.1 *Wetland Identification and Delineation*

Confluence used the methods described by the U.S. Army Corps of Engineers (Corps) in the *Corps of Engineers Wetland Delineation Manual* (Corps 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Regional Supplement; Corps 2010) to delineate wetland boundaries. The Corps usually requires that the following three characteristics be present for an area to be identified as a wetland: (1) hydrophytic vegetation, (2) hydric soil, and (3) wetland hydrology. Each criterion has a number of indicators by which it can be determined to satisfy the standard. The indicators were established so that if an area was wetland, sufficient indicators would be observed at any time of the year, including the driest months. Since “normal circumstances,” as defined by the Corps (1987), exist on the site, all three criteria must be present for an area to be determined a wetland. A more detailed description of delineation methodology is in Appendix B. Wetland delineation data forms are in Appendix C.

For wetland located offsite, Confluence modified the methods described by the Corps (Corps 1987, 2010) The modified method identifies the presence or absence of visual wetland indicators. If hydrophytic vegetation was dominant and visual indicators of wetland hydrology were observed, then hydric soils were assumed to be present.

The PLANTS Database (USDA NRCS 2018b) was used for scientific names and the 2016 National Wetland Plant List (Lichvar et al. 2016) was used to determine the wetland indicator status of plants.

### 2.2.2 *Wetland Rating*

Confluence determined wetland ratings using the Washington State Wetland Rating System for Western Washington (Hruby 2014) to assess the resource value of the wetlands identified on the site. This rating system is based on the wetland functions and values, sensitivity to disturbance, rarity, and irreplaceability. Wetland rating forms are in Appendix D.

Confluence also determined the wetland rating using MMC 18.02.230, as recommended by City planners during a meeting on April 1, 2019.

## 3.0 RESULTS

### 3.1 General Site Description

Available GIS databases were searched for the documented presence of wetlands, hydric soils, streams, lakes, or species listed under the Endangered Species Act as threatened or endangered (“listed species”). Results of the GIS databases searched are in Appendix A. In summary, a

wetland inventory number was assigned to the site according to a City of Monroe critical areas and buffers map (City of Monroe 2008). No other critical areas were mapped on or near the project site according to searched databases.

The site is a 1.15-acre, undeveloped property covered in reed canarygrass and lawn. A small circular area of ponded water was present in the central portion of the property at the time of the site visit. The property has a slight slope to the east but is relatively flat.

Photographs of the site are in Appendix E.

### 3.2 Test Plots

During the site visit, 8 test plots were established in both uplands and wetlands. Test plots are shown in Figure 2. The locations of the test plots were based on the presence of visual wetland indicators, such as wetland vegetation or evidence of standing water, or were chosen to represent vegetative communities on the property. Test plot summaries are detailed below. Appendix B provides explanation of technical terms.

Test Plot 1 (TP-1) was located in the central portion of the property, in an area dominated by wetland vegetation and near an area of ponded water. Dominant vegetation in TP-1 included reed canarygrass and creeping buttercup (*Ranunculus repens*). Vegetation within TP-1 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-3 inches) was a dark brown (10YR 3/3) silty loam with gravel. Soil in the second layer (3-8 inches) was a grayish brown (10YR 4/2) loam with 15 percent yellowish brown (10YR 5/6) redox concentrations in the matrix. Soil in the third layer (8-12 inches) was a black (10YR 2/1) silty loam with gravel and charcoal. Soil in the fourth layer (12-15 inches) was a dark yellowish brown (10YR 3/4) silty loam with gravel and 5 percent brown (7.5YR 4/4) redox concentrations in the matrix. Soils met the Depleted Matrix (F3) hydric soil indicator; therefore, the hydric soil criterion was met. Two primary indicators – High Water Table (A2) and Saturation (A3) – were observed. The presence of at least one primary or two secondary indicators meets the wetland hydrology criterion. Since TP-1 met all three criteria, the area represented by TP-1 is a wetland, identified as Wetland A.

TP-2 was located in the central portion of the property, just west of TP-1 in an area of creeping buttercup, reed canarygrass, soft rush (*Juncus effusus*), and lawn. Vegetation within TP-2 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-3 inches) was a dark brown (10YR 3/3) silty loam. Soil in the second layer (3-10 inches) was a dark grayish brown (10YR 4/2) loam with 15 percent yellowish brown (10YR 5/6) redox concentrations in the matrix. Soils met the Depleted Matrix (F3) hydric soil indicator; therefore, the hydric soil criterion was met. No primary or secondary wetland hydrology indicators were observed; thus, the wetland hydrology criterion was not met. Since TP-2 did not meet all three criteria, the area represented by TP-2 is not a wetland. TP-2 represents the transition zone



Figure 2. Test Plots and Wetland Boundary

between upland and Wetland A and the western boundary of the wetland.

TP-3 was located north of TP-2 in an area dominated by reed canarygrass and creeping buttercup. Vegetation within TP-3 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-6 inches) was a brown (10YR 4/3) loam with gravel and charcoal. Soil in the second layer (6-10 inches) was a grayish brown (2.5Y 5/2) sandy loam and gravel with 20 percent strong brown (7.5YR 4/6) redox concentrations in the matrix and pore linings. Soil in the third layer (10-15 inches) was a very dark brown (10YR 2/2) loam. Soil in the fourth layer (15-17 inches) was a grayish brown (2.5Y 5/2) sandy loam and gravel with 20 percent strong brown (7.5YR 4/6) redox concentrations in the matrix. Soils met the Depleted Matrix (F3) hydric soil indicator; therefore, the hydric soil criterion was met. No primary or secondary wetland hydrology indicators were observed; thus, the wetland hydrology criterion was not met. Since TP-3 did not meet all three criteria, the area represented by TP-3 is transition zone. TP-3 represents upland on the western edge of Wetland A.

TP-4 was located in the central portion of the property, north of TP-1. Dominant vegetation consisted of reed canarygrass and American purple vetch (*Vicia americana*). Vegetation within TP-4 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-4 inches) was a dark brown (10YR 3/3) silty loam with gravel. Soil in the second layer (4-11 inches) was a dark grayish brown (10YR 4/2) loam and gravel with 15 percent yellowish brown (10YR 5/6) redox concentrations in the matrix. Soil in the third layer (11-17 inches) was a black (10YR 2/1) silty loam with charcoal. Soils met the Depleted Matrix (F3) hydric soil indicator; therefore, the hydric soil criterion was met. Two primary indicators – High Water Table (A2) and Saturation (A3) – were observed. The presence of at least one primary or two secondary indicators meets the wetland hydrology criterion. Since TP-4 met all three criteria, the area represented by TP-4 is included in Wetland A.

TP-5 was located in the eastern portion of the property, in an area dominated by creeping buttercup and lawn (assumed to be facultative). Vegetation within TP-5 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-8 inches) was a very dark grayish brown (10YR 3/2) silty loam with gravel. Soil in the second layer (8-15 inches) was a brown (10YR 4/3) silty loam and gravel with 1 percent strong brown (7.5YR 4/6) and 2 percent dark reddish brown (5YR 3/4) redox concentrations in the matrix. The soils did not meet any hydric soil indicator; therefore, the hydric soil criterion was not met. Two primary indicators – High Water Table (A2) and Saturation (A3) – were observed. The presence of at least one primary or two secondary indicators meets the wetland hydrology criterion. Since TP-5 did not meet all three criteria, the area represented by TP-5 is upland.

TP-6 was located southeast of the area of ponded water. Dominant vegetation consisted of creeping buttercup, lawn, and vetch. Vegetation within TP-6 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-3 inches) was a very

dark brown (10YR 2/2) loam with gravel. Soil in the second layer (3-16 inches) was a dark yellowish brown (10YR 4/4) silty loam and gravel with 2 percent dark reddish brown (5YR 3/4) redox concentrations in the matrix. The soils did not meet any hydric soil indicator; therefore, the hydric soil criterion was not met. Two primary indicators – High Water Table (A2) and Saturation (A3) – were observed. The presence of at least one primary or two secondary indicators meets the wetland hydrology criterion. Since TP-6 did not meet all three criteria, the area represented by TP-6 is upland.

TP-7 was located in the northern portion of the property in an area dominated by lawn, creeping buttercup, and velvet grass (*Holcus lanatus*). Vegetation within TP-7 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-4 inches) was a dark brown (10YR 3/3) loam. Soil in the second layer (4-15 inches) was a brown (10YR 4/3) loam. The soils did not meet any hydric soil indicator; therefore, the hydric soil criterion was not met. Two primary indicators – High Water Table (A2) and Saturation (A3) – were observed. The presence of at least one primary or two secondary indicators meets the wetland hydrology criterion. Since TP-7 did not meet all three criteria, the area represented by TP-7 is upland in the northern portion of the property.

TP-8 was located in the eastern portion of the property, in an area dominated by lawn, creeping buttercup, reed canarygrass, and velvet grass. Vegetation within TP-8 passed the Dominance Test and therefore meets the wetland vegetation criterion. Soil in the top layer (0-5 inches) was a black (10YR 2/1) silty loam with gravel. Soil in the second layer (5-9 inches) was a dark brown (10YR 3/3) silty loam with gravel. Soil in the third layer (9-16 inches) consisted of two matrix colors with 50 percent black (10YR 2/1) and 50 percent dark brown (10YR 3/3) silty loam with charcoal. The soils did not meet any hydric soil indicator; therefore, the hydric soil criterion was not met. Two primary indicators – High Water Table (A2) and Saturation (A3) – were observed. The presence of at least one primary or two secondary indicators meets the wetland hydrology criterion. Since TP-8 did not meet all three criteria, the area represented by TP-8 is upland in the eastern portion of the property.

### 3.3 Wetlands

TP-1 and TP-4 represented areas that met all three wetland criteria on the property. Wetlands identified and delineated on-site as well as wetlands identified in GIS databases within 200 feet are described in detail below, summarized in Table 1, and shown in Figure 2.

**Table 1. Wetland Summary**

Wetland Name	Cowardin Classification <sup>1</sup>	Size	Ecology Wetland Rating					Monroe Rating <sup>2</sup>
			Water Quality	Hydrologic	Habitat	Total	Category	
<b>Wetland A</b>	Emergent	7,059 sq ft	7	5	4	17	III	III

NR – not rated

<sup>1</sup> FGDC 2013<sup>2</sup> Per MMC 18.02.230

Wetland A is located in the central portion of the property (Figure 2) and is 7,059 square feet in size. TP-1 and TP-4, described above, represent Wetland A. According to the Cowardin classification (FGDC 2013), Wetland A is a palustrine emergent wetland. Wetland A is dominated by reed canarygrass, creeping buttercup, and vetch. The boundary of Wetland A was determined by a vegetation shift from reed canarygrass to lawn, a minor topographic break, and change in soils. Soil probes were used throughout the property to assess soils and determine presence of hydrology to delineate the wetland boundary between test plot locations. Wetland A appeared to continue off-site to the east into the lawn of the adjacent single-family residential property. According to the 2014 Wetland Rating System (Hruby 2014), Wetland A was rated as a Category III wetland, with a water quality score of 6, hydrology score of 5, and habitat score of 4. According to MMC 18.02.230, Category III wetlands include wetlands that are hydrologically isolated, less than or equal to 1 acre in size, have only one wetland class (i.e., Cowardin classification), and are dominated (greater than 80% areal cover) by a single nonnative plant species (monotypic vegetation). Based on this definition, Wetland A meets the definition of Category III wetlands under MCC 18.02.230

#### 4.0 REGULATORY IMPLICATIONS

According to MMC 20.05.080.D, the following standard buffers apply:

- Wetland A is a Category III wetland and has a standard buffer of 80 feet.

Figure 3 shows the wetlands and their standard buffers. Development within these buffers or within the critical areas themselves requires compliance with MMC.



-  Parcel (Source: Snohomish County)
-  Revised Wetland Boundary
-  Wetland Buffer (80 ft)

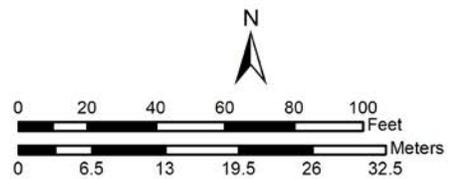


Figure 3. Wetland Buffer

## 5.0 PROPOSED DEVELOPMENT

The proposed development includes a single-family residence, and associated infrastructure, such as driveway and septic system. Figure 4 shows the development impact area for the proposed project. With the proposed layout, impacts to the wetland have been avoided. The driveway and house have been situated as far from the wetland boundary as possible.

However, since a majority of the property is encumbered by the wetland and its 80-foot buffer, impacts to wetland buffer cannot be avoided. Within the property, the 80-foot wetland buffer encompasses 33,459 square feet. Since the majority of the property is encumbered by critical areas, the application of MCC 22.80 would deny all reasonable use to the property. Therefore, development of the property with a single-family residence must use the Reasonable Use Exception, as allowed under MCC 22.80.50(C)2.

## 6.0 REASONABLE USE CRITERIA

According to MMC 22.80.50(C)2, development of the property may be allowed if consistent with the general purpose of MMC 22.80 and the public interest; provided that the hearing examiner, after a public hearing, finds the extent consistent with the constitutional rights of the applicant. The following are the criteria stipulated in MMC 22.80.50(C)2 followed by how the project complies with the criteria:

- a. This chapter would otherwise deny all reasonable use of the property.

Due to the shape of the parcel and the location of the wetland and associated buffer, the site is almost completely encumbered by critical areas. Compliance with MMC 22 would deny reasonable use of the property.

- b. There is no other reasonable use consistent with the underlying zoning of the property that has less impact on the critical area and/or critical area buffer.

The underlying zoning is R4. Based on an R4 zoning, 4 single-family residences could be built on the property. The proposed development of 1 single-family residence has less impact on the critical area and/or critical area buffer.

- c. The proposed development does not pose an unreasonable threat to the public health, safety, or welfare on or off the property.

The development of a single-family residence is consistent with the adjacent land use and does not pose an unreasonable threat to the public health, safety, or welfare on or off the property.

- d. Any alteration is the minimal necessary to allow for reasonable use of the property.

Impacts to the wetland have been avoided. Impacts to the wetland buffer have been avoided to the maximum extent by placing the septic drainfield and a majority of the driveway located off-site, outside of the 80-foot standard buffer. Therefore, the proposed development is the minimum necessary to allow for reasonable use of the property.

- e. The inability of the applicant to derive reasonable use of the property is not the result of the actions by the applicant after the effective date of the ordinance codified on this chapter or predecessor.

The inability of the applicant to derive reasonable use of the property is not the result of the actions by the applicant after the effective date of the ordinance codified on this chapter or predecessor. The property is vacant land and no action (e.g., clearing or grading) has occurred on the property, other than mowing, which has been occurring on the property for numerous years.

- f. The applicant may only apply for a reasonable use exception under this subsection if the applicant has also applied for a variance pursuant to MCC 22.66.

A variance will be applied for as part of the submittal package.

## 7.0 IMPACT ASSESSMENT AND MITIGATION

Wetland and buffer impacts were avoided by creating two easements with the adjacent property owner. One easement is for the septic drainfield and the other easement is for a shared driveway. By locating both the septic drainfield and driveway off-site, these features avoid impacts to the wetland and wetland buffer.

The City of Monroe has plans to improve Chain Lake Road; therefore, buffer averaging will not extend to the edge of the property (within 6 feet of the existing road right-of-way). If buffer averaging was implemented, the only location to increase the buffer is in the northern portion of the property, adjacent to Chain Lake Road, where road improvements would occur. Increasing the buffer to the edge of the road right-of-way would pose an additional hardship to the City of Monroe because then the City of Monroe would be responsible for mitigating impacts to the expanded wetland buffer when they improve Chain Lake Road.

Since buffer impacts cannot be avoided or mitigated for on-site, the purchase of mitigation bank credits is proposed. The project proposes to use either the Snohomish Basin Mitigation Bank or the Skykomish Habitat Bank. The property is located within the service area of both banks, and both banks provide the functions lost by the fill of the wetlands. Functions provided by the bank were determined based on information from the mitigation banking instruments (Habitat Bank 2005, Skykomish 2006). Table 2 summarizes the functions provided by both mitigation banks relevant to the functions lost by buffer impacts. The functions provided by the mitigation banks are the same as the wetland buffer functions being lost by the proposed development.

Table 2. Bank Functions Relevant to Lost Functions

Bank	Sediment Trapping	Wildlife/Fish Habitat
Snohomish Basin Bank	✓	✓
Skykomish Habitat Bank	✓	✓

For direct impacts to wetland buffers, the mitigation ratio proposed for the purchase of credits is 1:1 and is the mitigation ratio agreed to for buffers by the Mitigation Banking Instruments (Habitat Bank 2005, Skykomish 2006). Approximately 18,000 square feet of wetland buffer would be impacted; therefore, 18,000 square feet of buffer credits would be purchased. Credits will be purchased after permits are issued and before occupancy is allowed.

In addition to purchasing wetland buffer credits, the proposed project would also implement the following impact minimization measures listed in MMC Table 20.05.080.2:

- Lights will be directed away from the wetland;
- Grading around the house will prevent channelized flow from lawns that would otherwise directly enter the buffer;
- Runoff from impervious surfaces and new lawns will be infiltrated and dispersed into buffer; and
- Best management practices will be used to control dust during construction.

Figure 4 depicts the development footprint.



Figure 4. Proposed Development Footprint and Wetland Buffer Impacts

## 8.0 REFERENCES

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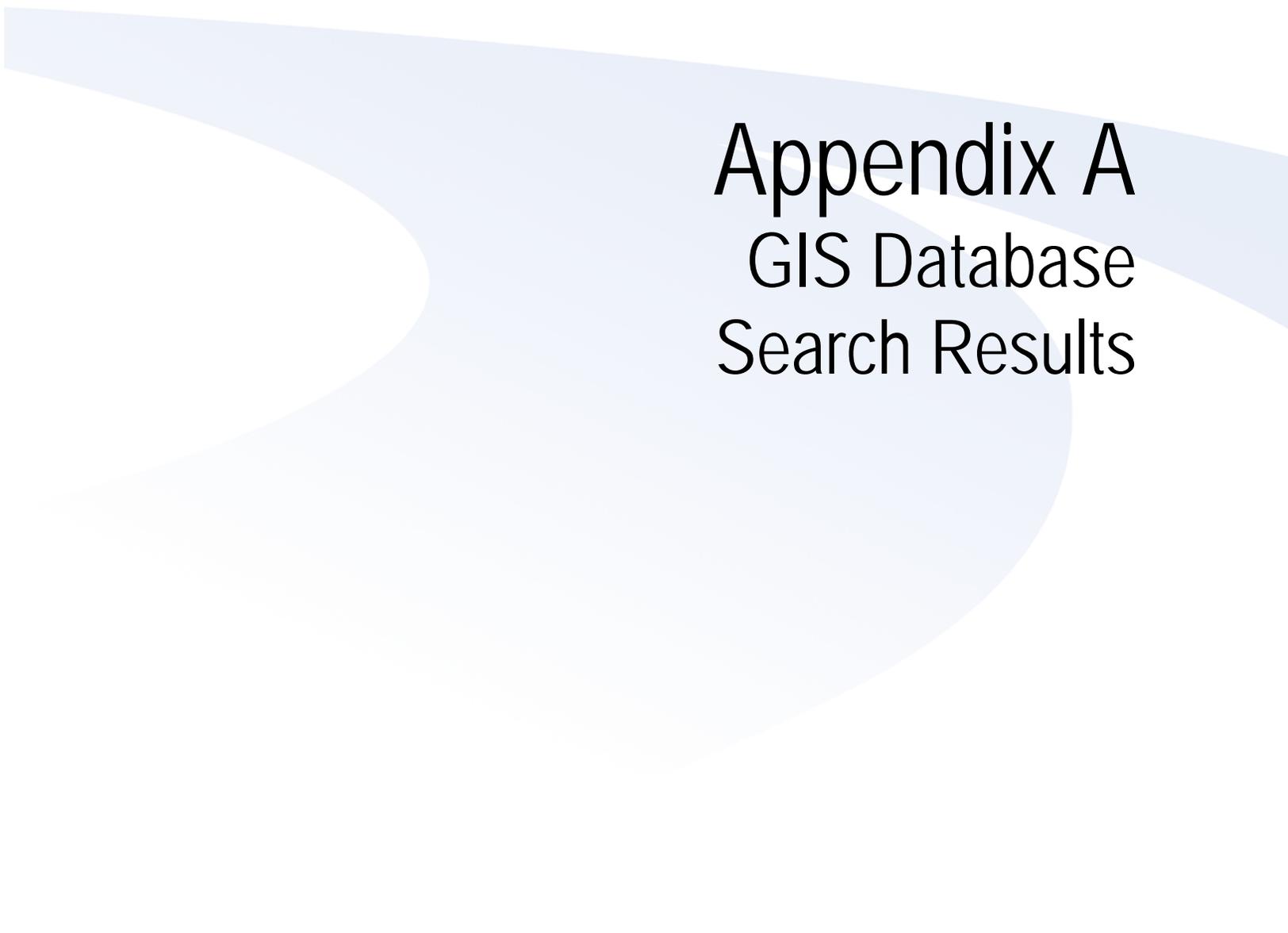
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# Appendix A

## GIS Database Search Results

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# City of Monroe



## Critical Areas and Buffers

### STREAMS

- Type 1
- Type 3
- Type 3u\*
- Type 4
- Type 5
- Unclassified Stream
- Stream Inventory No.

\*Unless determined an artificial waterway

### BOUNDARIES

- Urban Growth Area
- Monroe City Limits
- Shoreline Boundary

### WETLANDS

- Cat I
- Cat II
- Cat III
- Cat IV
- Unclassified Wetlands
- Wetland Inventory No.

### STEEP SLOPES

- 40% or > slope

### BUFFERS\*

- Combined Critical Areas Buffers

\*Type 4 stream buffer shown as 150 ft on each side of the channel. Type 4 streams, beyond a quarter mile of a stream with salmonids, have a buffer of 75 ft on each side of the channel. See MMC 20.05 for specific buffers.

### Notes:

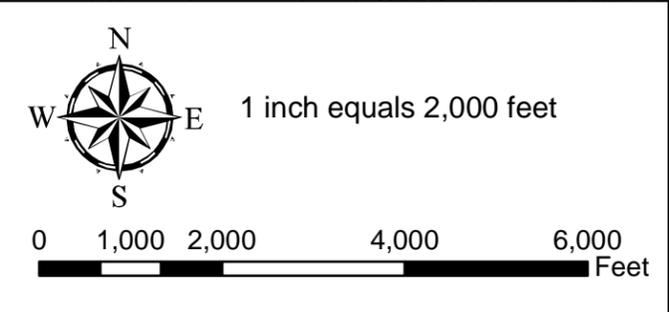
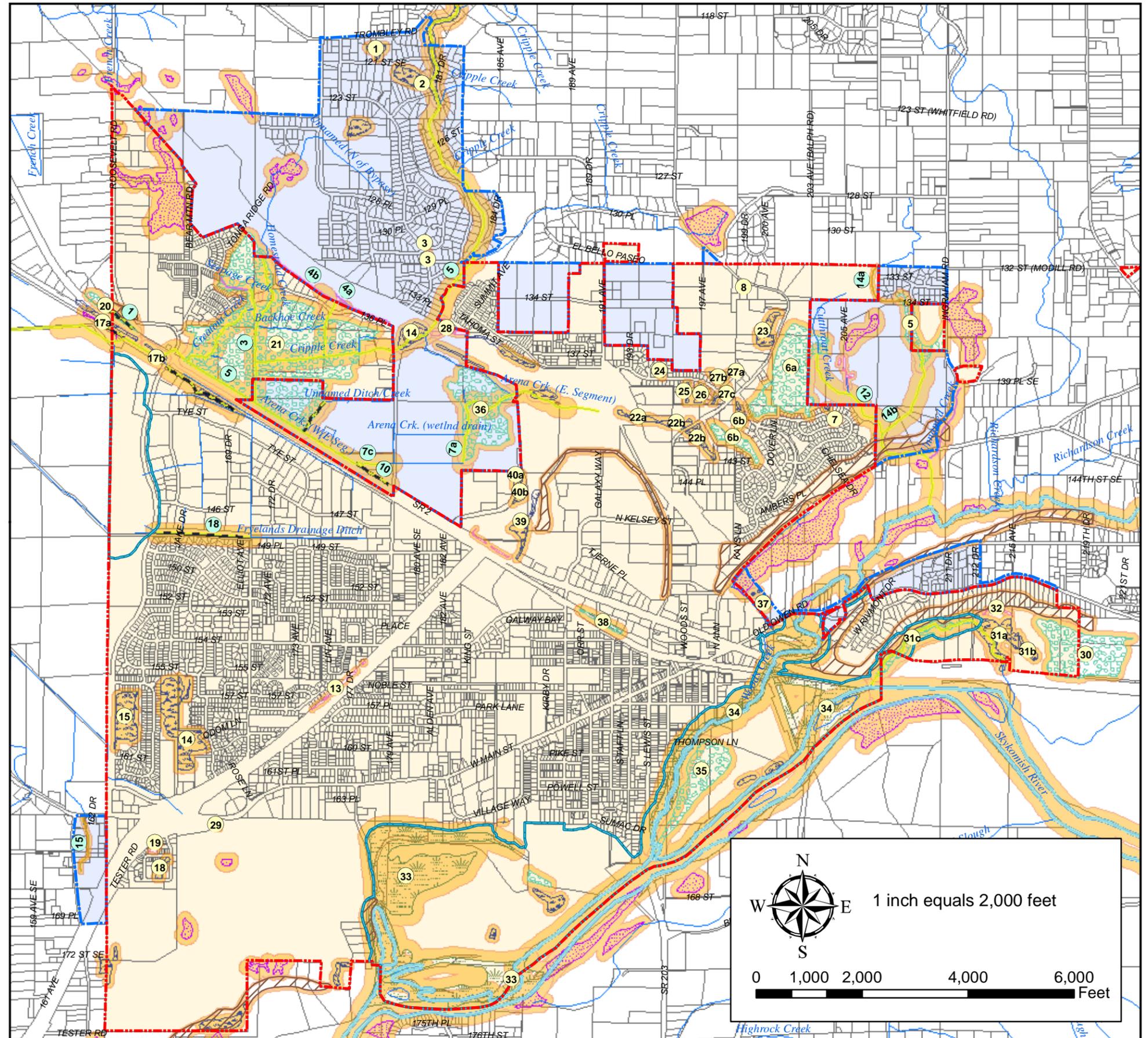
- 1) The locations depicted are approximate boundaries for critical areas within the city limits. This map provides only approximate boundaries of known features and is not a substitute for more detailed maps and/or studies to identify the exact locations of known features or additional critical area features not illustrated on the map.
- 2) The points where streams change classification are approximate and subject to confirmation and refinement.
- 3) Classifications are subject to refinement based upon on additional or updated fish use and seasonality of water flow information.



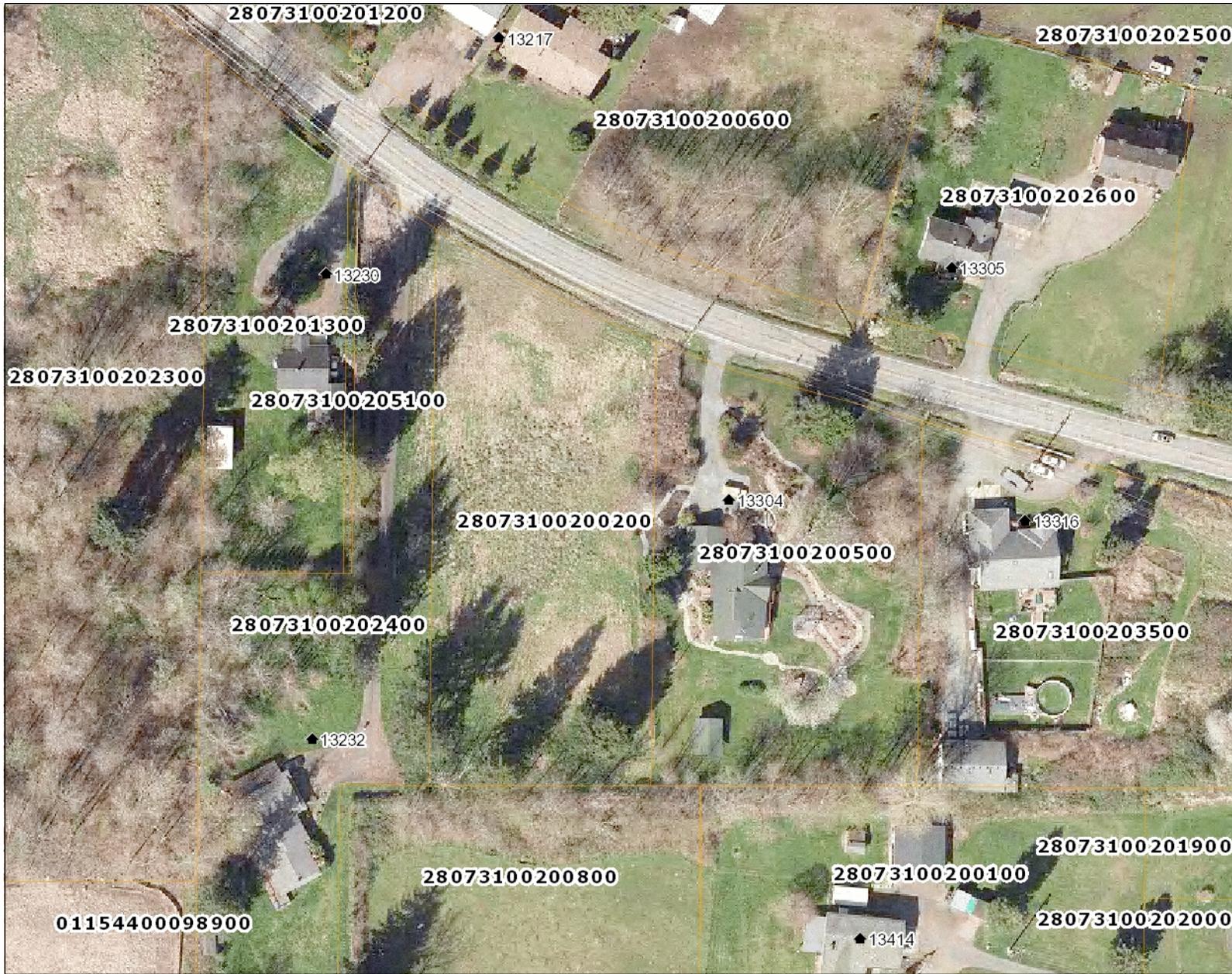
Map data shown is the property of the sources listed below. Inaccuracies may exist, and the City of Monroe implies no warranties or guarantees regarding any aspect of data depiction. This map is not an actual survey of individually noted critical areas. Streams have been categorized using the water typing system defined in Monroe Municipal Code Chapter 20.05 (equivalent to WAC 222-16-031). Wetlands were classified using the Washington Department of Ecology's Washington State Wetland Rating system for Western Washington. Wetland size, shape and location are approximate based on a reconnaissance level evaluation. The City of Monroe and the Urban Growth Area may contain additional critical areas not identified on this map. Therefore this map is to be used for reference purposes only.

Source: City of Monroe GIS, 2008;  
The Watershed Company;  
Snohomish County GIS, 2007

Project: Monroe Critical Area Buffers 11x17  
Location: Y:\GIS\Departments\CD\Critical Areas\Monroe critical area buffer 2008 (12-04-08) 11x17.mxd  
Revised: 12-04-08  
Author: R. Wright



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### Legend

- Parcel ID
- Address Points
- Critical Area Site Plans
- Snohomish County Tax Parcels
- Hydric Soils
- National Wetland Inventory
  - No Data
  - Estuarine and Marine Deepwater
  - Estuarine and Marine Wetland
  - Freshwater Emergent Wetland
  - Freshwater Forested/Shrub Wetland
  - Freshwater Pond
  - Lake
  - Other
  - Riverine
- Snohomish County Wetland Inventory
- Tulip Wetlands
  - Tulip Wetland Class 1
  - Tulip Wetland Class 2
  - Tulip Wetland Class 3
- Planning Development and Services Wetland Inventory

1: 1,200



0.0 0 0.02 0.0 Miles

Projection: NAD\_1983\_StatePlane\_Washington\_North\_FIPS\_4601\_Feet  
Planning and Development Services, Snohomish County

All maps, data, and information set forth herein ("Data"), are for illustrative purposes only and are not to be considered an official citation to, or representation of, the Snohomish County Code. Amendments and updates to the Data, together with other applicable County Code provisions, may apply which are not depicted herein. Snohomish County makes no representation or warranty concerning the content, accuracy, currency, completeness or quality of the Data contained herein and expressly disclaims any warranty of merchantability or fitness for any particular purpose. All persons accessing or otherwise using this Data assume all responsibility for use thereof and agree to hold Snohomish County harmless from and against any damages, loss, claim or liability arising out of any error, defect or omission contained within said Data. Washington State Law, Ch. 42.56 RCW, prohibits state and local agencies from providing access to lists of individuals intended for use for commercial purposes and, thus, no commercial use may be made of any Data comprising lists of individuals contained herein.

### Notes

This map was automatically generated using Geocortex Essentials.



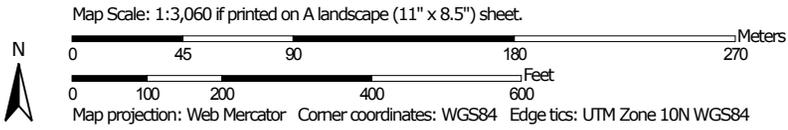
January 24, 2018

**Wetlands**

-  Estuarine and Marine Deepwater
-  Estuarine and Marine Wetland
-  Freshwater Emergent Wetland
-  Freshwater Forested/Shrub Wetland
-  Freshwater Pond
-  Lake
-  Other
-  Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

Soil Map—Snohomish County Area, Washington



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

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

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

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

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

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

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

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

Soil Survey Area: Snohomish County Area, Washington

Survey Area Data: Version 17, Nov 22, 2017

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

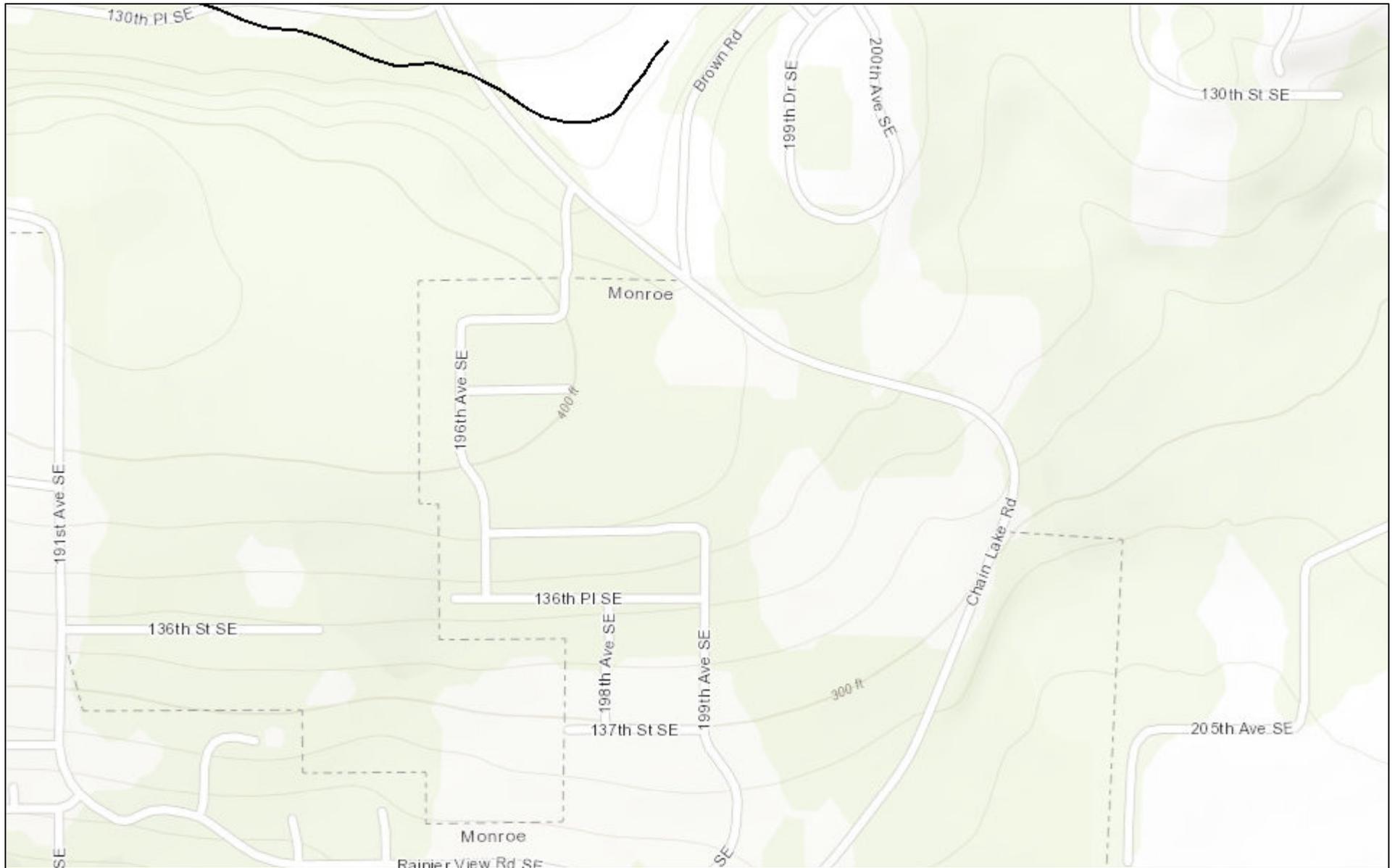
Date(s) aerial images were photographed: Mar 29, 2016—Oct 10, 2016

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

## Map Unit Legend

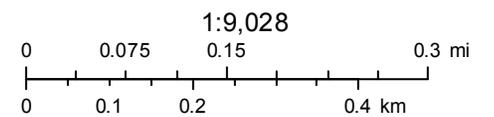
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Alderwood gravelly sandy loam, 15 to 30 percent slopes	0.4	0.9%
72	Tokul gravelly medial loam, 0 to 8 percent slopes	19.7	48.6%
73	Tokul gravelly medial loam, 8 to 15 percent slopes	20.4	50.5%
<b>Totals for Area of Interest</b>		<b>40.4</b>	<b>100.0%</b>

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January 24, 2018

— All SalmonScape Species



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey,



# WASHINGTON DEPARTMENT OF FISH AND WILDLIFE PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPublic  
REPORT DATE: 01/22/2018 2.57

Query ID: P180122145659

Common Name	Site Name	Priority Area	Accuracy	Federal Status	Sensitive Data	Source Entity
Scientific Name	Source Dataset	Occurrence Type		State Status	Resolution	Geometry Type
Notes	Source Record	More Information (URL)		PHS Listing Status		
	Source Date	Mgmt Recommendations				
Freshwater Emergent	N/A	Aquatic Habitat	NA	N/A	N	US Fish and Wildlife Service
	NWIIWetlands	Aquatic habitat		N/A	AS MAPPED	Polygons
		<a href="http://www.ecy.wa">http://www.ecy.wa</a>		PHS Listed		
Freshwater Emergent	N/A	Aquatic Habitat	NA	N/A	N	US Fish and Wildlife Service
	NWIIWetlands	Aquatic habitat		N/A	AS MAPPED	Polygons
		<a href="http://www.ecy.wa">http://www.ecy.wa</a>		PHS Listed		
Freshwater Emergent	N/A	Aquatic Habitat	NA	N/A	N	US Fish and Wildlife Service
	NWIIWetlands	Aquatic habitat		N/A	AS MAPPED	Polygons
		<a href="http://www.ecy.wa">http://www.ecy.wa</a>		PHS Listed		

DISCLAIMER. This report includes information that the Washington Department of Fish and Wildlife (WDFW) maintains in a central computer database. It is not an attempt to provide you with an official agency response as to the impacts of your project on fish and wildlife. This information only documents the location of fish and wildlife resources to the best of our knowledge. It is not a complete inventory and it is important to note that fish and wildlife resources may occur in areas not currently known to WDFW biologists, or in areas for which comprehensive surveys have not been conducted. Site specific surveys are frequently necessary to rule out the presence of priority resources. Locations of fish and wildlife resources are subject to variation caused by disturbance, changes in season and weather, and other factors. WDFW does not recommend using reports more than six months old.



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Data Active (7) Legend

Statewide Parcels 2016  
Parcel - County

Water Bodies  
Water Bodies

- Flats/Gravel Bars
- Ice
- Man Made Features
- Open Water
- Wet Area

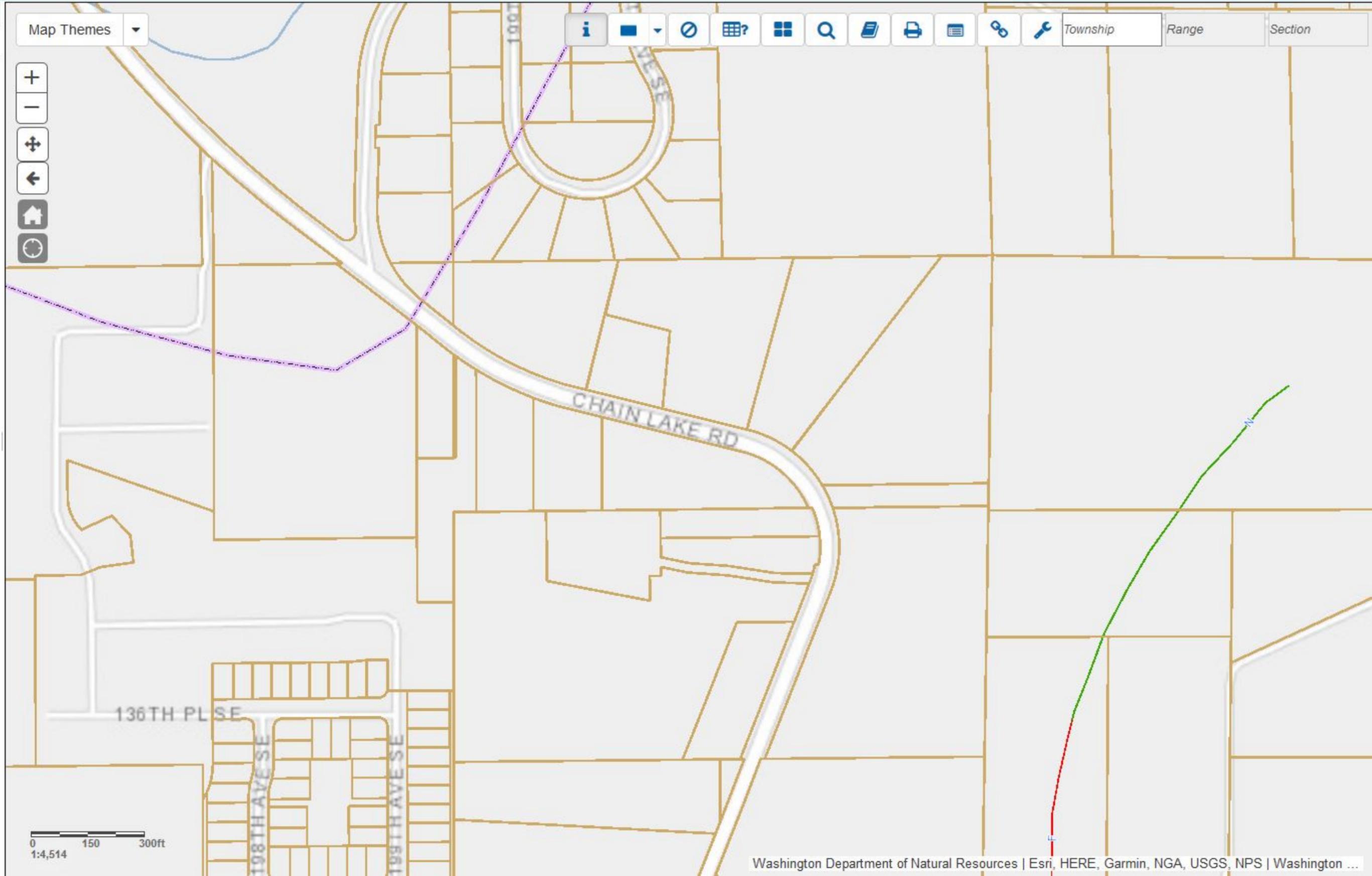
Streams  
Streams

- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

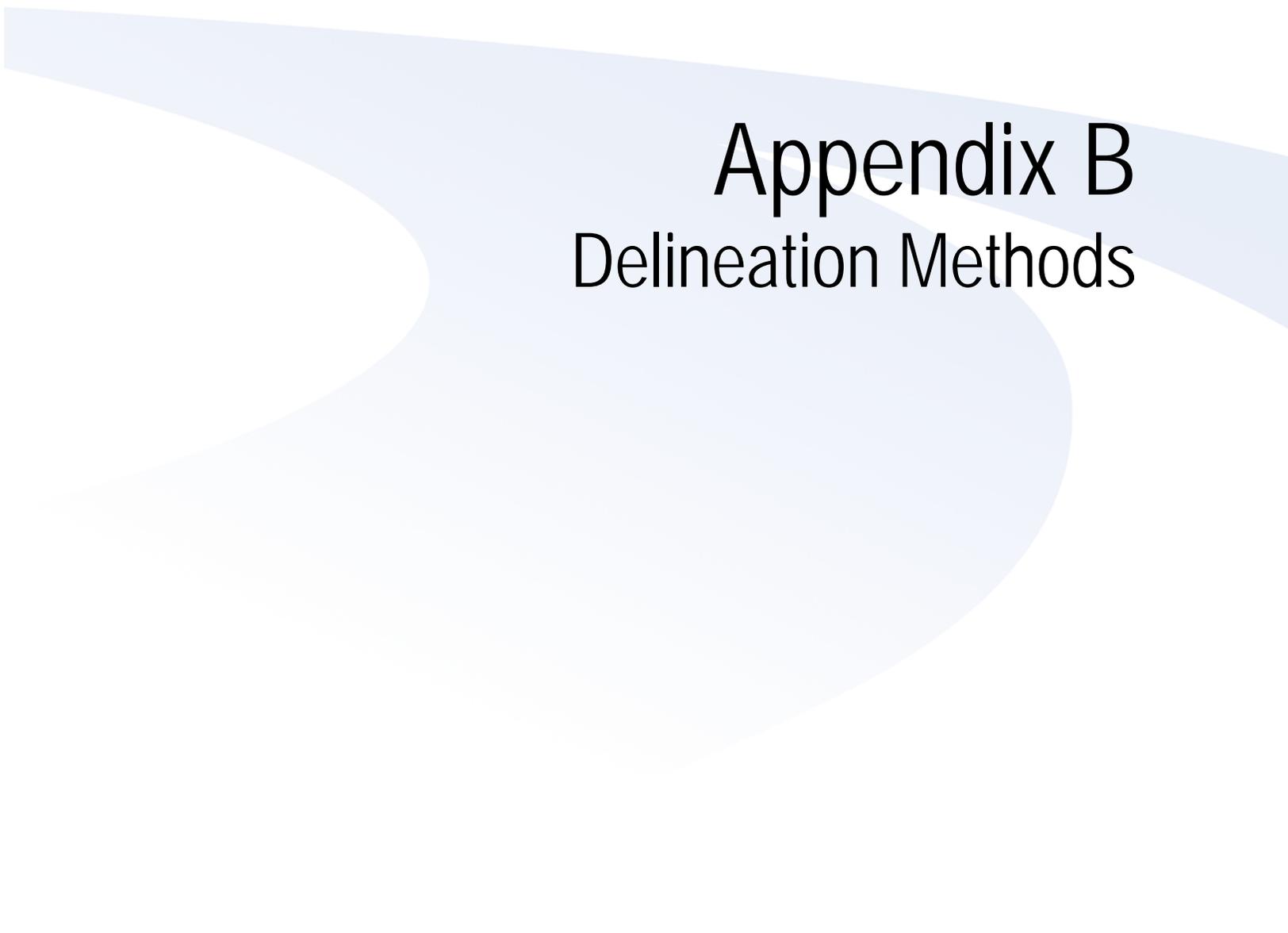
WRIA  
WRIA

WUA  
WUA

Townships  
Townships



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# Appendix B

## Delineation Methods

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# CONFLUENCE ENVIRONMENTAL COMPANY WETLAND DELINEATION METHODS

Prepared by:

Confluence Environmental Company  
2018

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## TABLE OF CONTENTS

<b>1.0 WETLANDS</b> .....	<b>1</b>
1.1 Methods Used to Determine Wetlands .....	1
1.2 Wetland Criteria .....	2
1.2.1 Hydrophytic Vegetation .....	2
1.2.2 Hydric Soils .....	3
1.2.3 Hydrology .....	4
<b>2.0 REFERENCES</b> .....	<b>4</b>

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This report describes the methods used to determine the presence or absence of critical areas in a project area.

## 1.0 WETLANDS

### 1.1 Methods Used to Determine Wetlands

Confluence delineates the boundaries of wetlands using the “Routine Determinations for Areas Less Than 5 Acres in Size” method described by the U.S. Army Corps of Engineers (Corps) in the *Corps of Engineers Wetlands Delineation Manual* (Delineation Manual; Corps 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps 2010) (Regional Supplement). The Regional Supplement was part of a nationwide effort to address regional wetland characteristics and improve the accuracy and efficiency of wetland-delineation procedures. The Regional Supplement uses the best available science to address regional differences in climate, geology, soils, hydrology, and plant and animal communities that cannot be addressed in a single national document, such as the Delineation Manual. The Regional Supplement was designed for use with the 1987 Delineation Manual and all subsequent versions. Where differences in the two documents occur, the Regional Supplement takes precedence over the 1987 Delineation Manual (Corps 2010). The Regional Supplement was developed to clarify the indicators of hydrophytic vegetation, hydric soils, and wetland hydrology found in the region (these indicators are discussed in detail in the section below). It is important to note that areas that may have been determined as a wetland under the 1987 Delineation Manual may not be determined as wetland under the Regional Supplement, and vice versa.

Confluence uses the PLANTS Database (USDA NRCS 2018) for scientific names and the 2016 National Wetland Plant List (Lichvar 2016) to determine the wetland indicator status of plants. Wetlands are classified using the Cowardin Classification System (Cowardin et al. 1979). Confluence determines the wetland rating using Washington State Department of Ecology’s Wetland Rating System for Western Washington (Hruby 2014). The National Wetland Inventory is also researched to determine if wetlands have previously been identified on the property (USFWS 2018).

The locations of test plots, soil cores, and wetland edges on a project property are recorded using a differential Global Positioning System with sub-meter accuracy. Delineated and surveyed wetland boundaries are subject to verification and approval by jurisdictional agencies.

## 1.2 Wetland Criteria

There is specific technical language that applies to the study of wetlands. This section briefly explains the language Confluence uses in its wetland delineation reports.

The identification of wetlands is based on three criteria: hydrophytic vegetation, hydric soils, and hydrology; each criterion has a number of indicators by which it can be determined to satisfy the standard. The Corps, which is the federal authority on the regulation of wetlands, has developed the guidance and the Data Sheet that are the standards used in all wetland determinations. The information presented below is based on their Wetland Delineation Manual (Corps 1987) and Regional Supplement (Corps 2010).

In order to characterize a wetland, data are collected from representative test plots. The delineator chooses areas both within and outside of a potential wetland that are representative of particular vegetative, topographic, and hydrologic features in the vicinity. Those areas then become test plots where particular data (see sections below) about vegetation, soils, and hydrology are collected to determine whether wetland characteristics are present. Plots that meet all three wetland criteria are wetland plots; plots that do not meet the three wetland criteria are upland plots. The test plots (along with topographic and vegetative shifts) then inform the wetland boundaries, with wetland plots being within the wetlands and upland plots being outside of the wetlands.

### 1.2.1 *Hydrophytic Vegetation*

Vegetation is often the first visual cue that an area is a wetland. Similarly, vegetation often also signals the shift from wetland to non-wetland. The question regarding plants to be answered when performing a wetland delineation is: “Is the vegetation hydrophytic?” That is, is the vegetation of the variety that is adapted to live in wetter-than-average conditions? To determine the answer, there are a few resources and steps to follow. First, the indicator status for each plant present in the test plot is determined from the National Wetland Plant List (Lichvar 2016). The indicator status is a continuum from almost exclusively occurring in wetlands (obligate wetland plants, or OBL) to almost exclusively never found in wetlands (obligate upland plants, or UPL). The middle ground between those two extremes is known as a facultative plant (or FAC), which is found equally in wetland and upland environments. The FAC category has two further gradations: facultative upland plants (FACU), which are plants that are usually found in uplands, and facultative wetland plants (FACW), which are plants that are usually found in wetlands.

After the status of each plant species in the test plot has been determined, the hydrophytic vegetation indicator can be applied. The application of the indicators is performed sequentially, and once one is “passed,” the box for hydrophytic vegetation is “checked,” and the process continues to the next criterion. The first hydrophytic vegetation indicator is the “Rapid Test,” which means with a quick visual survey, all the plants in the test plot are either OBL or FACW.

The second test is the “Dominance Test.” For the Dominance Test, the total number of dominant species in the test plot is divided by the number of species that are OBL, FACW, or FAC. The resulting percentage must be greater than 50 to pass this test. The third test is the “Prevalence Index.” The Prevalence Index is a weighted average of the absolute cover of all the plant species present in the plot, regardless of dominance. There are also two other, less common, indicators: morphological adaptations (e.g., buttressed trunks), or non-vascular plant species (e.g., sphagnum moss).

### 1.2.2 *Hydric Soils*

The soils tell the story about the presence of water over time. The National Technical Committee defines a hydric soil as: “...a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part.” (USDA 1994) The question to be answered here is: “Has water been present long enough and recently enough to form hydric soils?” In order to examine the soil characteristics, a test pit must be dug, usually to about 18 inches. A sliver of soil from the test pit is extracted with a shovel (i.e., the soil profile) to examine the layers. The thickness, color, texture, redox features, and any other interesting information about each layer is observed and recorded. Those features are described more fully in the bullets below.

- **Thickness.** Layers are measured to the nearest inch. Usually, each soil profile has at least two layers.
- **Color.** Color is determined by comparison to a color chart. The industry standard is the Munsell Soil-Color Chart, which assigns each color a designation for hue, value, and chroma (e.g., 10YR 3/2, where 10YR=hue, 3=value, and 2=chroma).
- **Texture.** The precision of texture description for the purpose of wetland delineation is at a general scale. The Washington State University texture chart (Cogger 2010) is often used, but the delineator just needs to determine if the soil is sandy or loamy/clayey.
- **Redox Features.** The most common redox features are concentrations or depletions of iron in the soil matrix. Concentrations occur as red or yellow deposits, and depletions occur as grayish deposits.

When the soil profile is fully described, it can be determined if any of the layers meet a hydric soil indicator. Hydric soil indicators help to identify hydric soils. The presence of any indicator signifies a hydric soil, although a soil may be hydric and not meet any indicators. There are 19 hydric soil indicators in our region, 1 of which were observed at the site (Corps 2010). Additional hydric soil terminology definitions are in the sidebar.

- **F3 – Depleted Matrix.** A soil layer that has a depleted matrix with 60 percent or more chroma of  $\leq 2$ , with a thickness of either:
  - 2 inches, if entirely within the upper 6 inches of soil surface, or
  - 6 inches, starting within 10 inches of soil surface.

### 1.2.3 Hydrology

Wetland hydrology is the broadest criterion and has to do with signs of saturation and inundation in the test plot. While hydrophytic vegetation and hydric soils are the result of hydrology, they remain even during the dry season, whereas hydrology can be less apparent or absent during the dry season. The hydrology indicators are broad enough to encompass characteristics that may be present even during the dry season. Hydrology indicators are in four groups:

- Group A is based on direct observation of surface or ground water;
- Group B consists of evidence that the site is subject to inundation;
- Group C consists of other evidence that soil is or was saturated; and
- Group D consists of landscape, vegetation, and soil characteristics indicating contemporary wet conditions.

The indicators are further divided into two categories: primary and secondary. A test plot must have either one primary or two secondary indicators to pass the hydrology criterion. Primary and secondary indicators observed during this delineation are recorded on the wetland delineation data forms in Appendix C.

## 2.0 REFERENCES

Cogger, C.G. 2010. Estimating soil texture flowchart. Washington State University Puyallup Research Center, Puyallup.

### More Hydric Soils Definitions (adapted from Corps 2010)

*Matrix:* the dominant soil volume in a given soil layer

*Depleted Matrix:* the volume of a soil horizon in which soil processes have removed or transformed iron, creating colors of low chroma and high value, specifically:

- Value  $\geq 5$ , chroma = 1, with or without redox features
- Value  $\geq 6$ , chroma = 1 or 2, with or without redox features
- Value of 4 or 5, chroma = 2,  $\geq 2\%$  distinct or prominent redox features
- Value of 4, chroma = 1,  $\geq 2\%$  distinct or prominent redox features

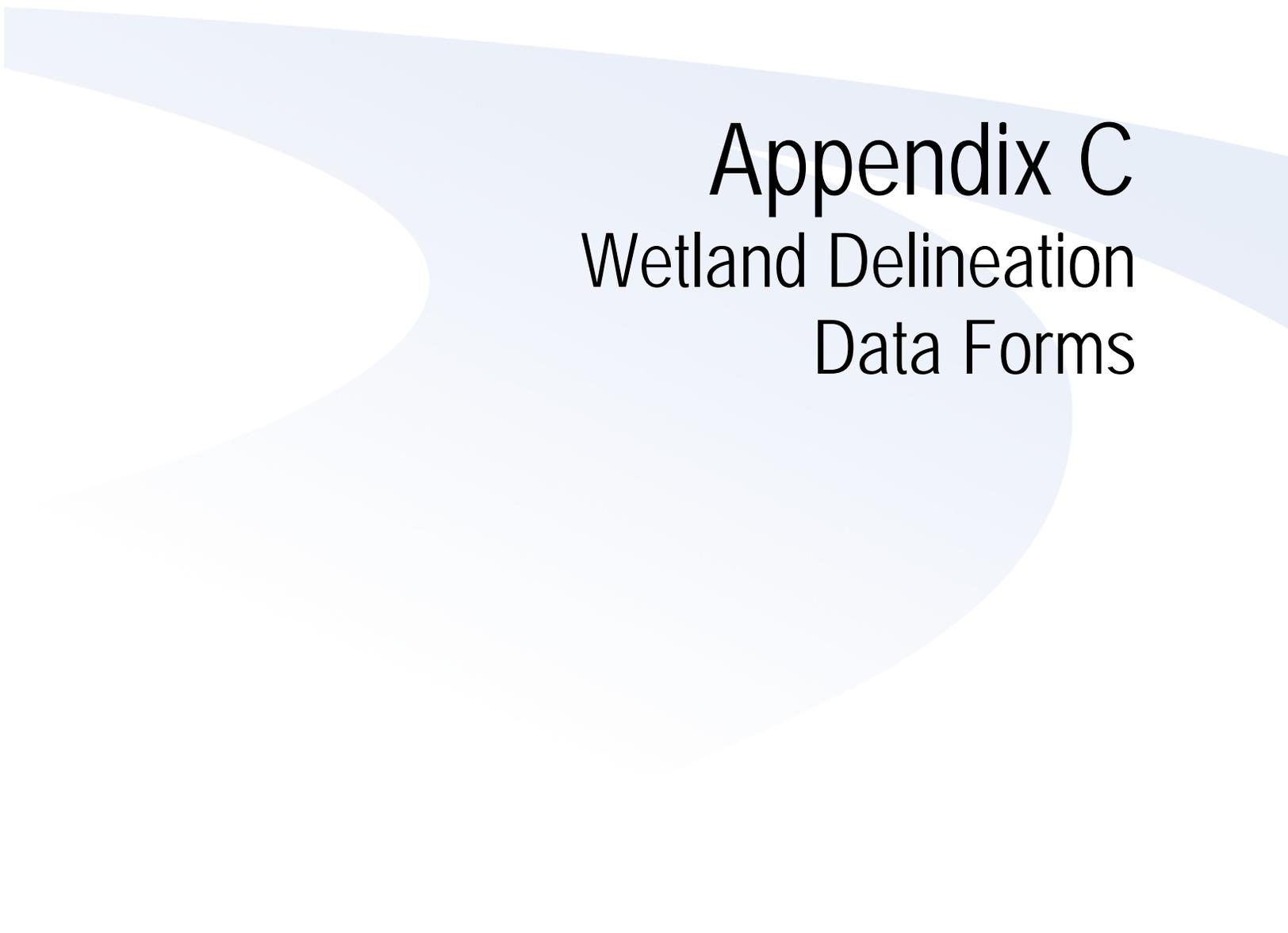
*Distinct:* readily seen, but contrasting\* moderately with comparison color

*Prominent:* readily seen and contrasting\* greatly with comparison color

\*See Corps 2010, Table A1, page 130 for full key on contrast determinations.

- Corps (U.S. Army Corps of Engineers). 1987. Corps of Engineers Wetlands Delineation Manual. Corps Environmental Laboratory, Waterways Experiment Station, Technical Report Y-87-1, Vicksburg, Mississippi.
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- USDA NRCS. 2018b. The PLANTS database. USDA NRCS National Plant Data Team, Greensboro, North Carolina. Available at: <http://plants.usda.gov> (accessed on January 26, 2018).
- USDA (U.S. Department of Agriculture) Soil Conservation Service. 1994. Changes in hydric soils of the United States. *Federal Register* 59(133): 35680-35681, July 13, 1994.
- USFWS (U.S. Fish and Wildlife Service). 2018. National Wetlands Inventory. U.S. Fish and Wildlife Service, Branch of Geospatial Mapping and Technical Support, Arlington, VA. URL: <http://www.fws.gov/wetlands/Wetlands-Mapper.html> (accessed January 26, 2018).

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# Appendix C

## Wetland Delineation Data Forms

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

Project/Site: Chainlk Rd City/County: Monroe/Sonoma Sampling Date: 01/22/18  
 Applicant/Owner: Michael Suschick State: WA Sampling Point: TP-01  
 Investigator(s): KAM/AER Section, Township, Range: S37 T28N W R07E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOXU gravelly medial loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____ Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Remarks: <u>very poor lighting making soils appear darker/duller</u>	

**VEGETATION – Use scientific names of plants.**

Stratum	Plot size	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet
<u>Tree Stratum</u>	<u>(Plot size: 10')</u>				Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
1. _____					Total Number of Dominant Species Across All Strata: <u>2</u> (B)
2. _____					Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
3. _____					<b>Prevalence Index worksheet:</b> 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 = _____
4. _____					
Sapling/Shrub Stratum (Plot size: <u>10'</u> ) <u>0</u> = Total Cover					
1. _____					
2. _____					
Herb Stratum (Plot size: <u>10'</u> ) <u>0</u> = Total Cover					
1. <u>reed canarygrass</u>		<u>100</u>	<u>X</u>	<u>FACW</u>	
2. <u>creeping buttercup</u>		<u>75</u>	<u>X</u>	<u>FACW</u>	
3. <u>SOFT RUSH</u>		<u>10</u>		<u>FACW</u>	
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
Woody Vine Stratum (Plot size: <u>101</u> ) <u>185</u> = Total Cover					
1. _____					
2. _____					
% Bare Ground in Herb Stratum <u>0</u> <u>0</u> = Total Cover					
Remarks: _____					
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____					

**SOIL**

Sampling Point: TP-01

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/3	100					Silty loam w/ gravel	
3-8	10YR 4/2	85	10YR 5/6	15	C	M	loam	
8-12	10YR 2/1	100					Silty loam w/ gravel & charcoal	
12-15	10YR 3/4	95	7.5YR 4/4	5	C	M	Silty loam w/ gravel	

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

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

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): 8"

Saturation Present? Yes  No  Depth (inches): 0

(includes capillary fringe)

Wetland Hydrology Present? Yes  No

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

Remarks:

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

Project/Site: Chain UK Rd City/County: Monroe/Shoehomks Sampling Date: 01/22/18  
 Applicant/Owner: Michael Suschick State: WA Sampling Point: TP-2  
 Investigator(s): KAM/AER Section, Township, Range: 831 T28NW R07E  
 Landform (hillslope, terrace, etc.): \_\_\_\_\_ Local relief (concave, convex, none): none Slope (%): 3%  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOKM gravelly medial loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____	<b>Is the Sampled Area within a Wetland?</b>	Yes _____	No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No _____			
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>			
Remarks:					

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
				<u>0</u> = Total Cover
Sapling/Shrub Stratum (Plot size: <u>10'</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
				<u>0</u> = Total Cover
Herb Stratum (Plot size: <u>10'</u> )				
1. <u>PCA</u>	<u>25</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
2. <u>Credens buttercup</u>	<u>40</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Soft rush</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	
4. <u>lawn (unid grass)</u>	<u>10</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
				<u>145</u> = Total Cover
Woody Vine Stratum (Plot size: <u>10'</u> )				
1. _____				
2. _____				
				<u>0</u> = Total Cover
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

**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:**

\_\_\_ 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

\_\_\_ 3 - Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_ 5 - Wetland Non-Vascular Plants<sup>1</sup>

\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

**Hydrophytic Vegetation Present?** Yes  No \_\_\_\_\_

**SOIL**

Sampling Point: TP-2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/3	100					silt loam	
3-10	10YR 4/2	85	10YR 5/6	15	C	M	loam	
10-15	10YR 2/1	100					silt loam w/c charcoal	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)		
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)		
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)		
<b>Restrictive Layer (if present):</b>			<b>Hydric Soil Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Type: _____	Depth (inches): _____		

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

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

**Field Observations:**

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): <u>13"</u>	
(includes capillary fringe)		

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

Remarks:

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

Project/Site: Chain Lk Rd City/County: monroe/Snohomish Sampling Date: 01/22/18  
 Applicant/Owner: Michael Suschick State: WA Sampling Point: TP-3  
 Investigator(s): APR/KAM Section, Township, Range: S31 T28N W R06E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOKU gravelly medial loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes  No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No _____	
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>	
Remarks:			

### VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)
2. _____	_____	_____	_____	Total Number of Dominant Species Across All Strata: <u>2</u> (B)
3. _____	_____	_____	_____	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____	_____	_____	_____	<b>Prevalence Index worksheet:</b> 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 = _____
Sapling/Shrub Stratum (Plot size: <u>10'</u> ) 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ _____ = Total Cover				
Herb Stratum (Plot size: <u>10'</u> ) 1. <u>YCA</u> <u>80</u> <input checked="" type="checkbox"/> <u>FACW</u> 2. <u>Creeping buttercup</u> <u>50</u> <input checked="" type="checkbox"/> <u>FAC</u> 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____ 11. _____ _____ = Total Cover				
Woody Vine Stratum (Plot size: <u>10'</u> ) 1. _____ 2. _____ _____ = Total Cover				<b>Hydrophytic Vegetation Indicators:</b> ___ 1 - Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 <sup>1</sup> ___ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants <sup>1</sup> ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>
% Bare Ground in Herb Stratum <u>0</u> _____ = Total Cover				
Remarks:				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____



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

Project/Site: Chain Lk Rd City/County: Monroe/Snohomish Sampling Date: 01/22/18  
 Applicant/Owner: Michael Juschick State: WA Sampling Point: TP-4  
 Investigator(s): YAM/AFR Section, Township, Range: S31 T2B NW 207E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOKUL gravelly medial loam NWI classification: \_\_\_\_\_

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

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____	<b>Is the Sampled Area within a Wetland?</b>	Yes <input checked="" type="checkbox"/>	No _____
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No _____			
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No _____			
Remarks:					

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	<b>Dominance Test worksheet:</b>	
1. _____				Number of Dominant Species That Are OBL, FACW, or FAC:	<u>2</u> (A)
2. _____				Total Number of Dominant Species Across All Strata:	<u>2</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC:	<u>100</u> (A/B)
4. _____				<b>Prevalence Index worksheet:</b>	
	<u>0</u>		= Total Cover	Total % Cover of:	Multiply by:
<b>Sapling/Shrub Stratum (Plot size: <u>10'</u>)</b>				OBL species	x 1 = _____
1. _____				FACW species	x 2 = _____
2. _____				FAC species	x 3 = _____
3. _____				FACU species	x 4 = _____
4. _____				UPL species	x 5 = _____
5. _____				Column Totals:	(A) _____ (B) _____
<b>Herb Stratum (Plot size: <u>10'</u>)</b>				Prevalence Index = B/A = _____	
1. <u>vcg</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b>	
2. <u>vefch</u>	<u>80</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	___ 1 - Rapid Test for Hydrophytic Vegetation	
3. _____				<input checked="" type="checkbox"/> 2 - Dominance Test is >50%	
4. _____				___ 3 - Prevalence Index is ≤3.0 <sup>1</sup>	
5. _____				___ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)	
6. _____				___ 5 - Wetland Non-Vascular Plants <sup>1</sup>	
7. _____				___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
8. _____				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
9. _____					
10. _____					
11. _____					
<b>Woody Vine Stratum (Plot size: <u>10'</u>)</b>				<b>Hydrophytic Vegetation Present?</b>	
1. _____				Yes <input checked="" type="checkbox"/>	No _____
2. _____					
<b>% Bare Ground in Herb Stratum <u>0</u></b>					
Remarks:					

**SOIL**

Sampling Point: TP-4

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/3	100					Silt loam w/ gravel	
4-11	10YR 4/2	85	10YR 5/6	15	C M		Loam w/ gravel	
11-17	10YR 2/1	100					Silt loam w/ charcoal	

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

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

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

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): 9"

Saturation Present? Yes  No  Depth (inches): 8"  
(includes capillary fringe)

**Wetland Hydrology Present?** Yes  No

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

Remarks:

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

Project/Site: Chain LK Rd City/County: monroe/snohomish Sampling Date: 01/22/18  
 Applicant/Owner: Michael Suschick State: WA Sampling Point: TP-5  
 Investigator(s): KAM/AER Section, Township, Range: S31 T28N R07E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOKU gravelly medial 10am NWI classification: \_\_\_\_\_  
 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 \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks:			

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____				
2. _____				
3. _____				
4. _____				
				<u>0</u> = Total Cover
Sapling/Shrub Stratum (Plot size: <u>10'</u> )				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
				<u>0</u> = Total Cover
Herb Stratum (Plot size: <u>10'</u> )				
1. <u>lawn</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>Creeping buttercup</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>Soft rush</u>	<u>10</u>		<u>FACW</u>	
4. <u>vetch</u>	<u>15</u>		<u>FAC</u>	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
				<u>185</u> = Total Cover
Woody Vine Stratum (Plot size: <u>10'</u> )				
1. _____				
2. _____				
				<u>0</u> = Total Cover
% Bare Ground in Herb Stratum <u>0</u>				<u>0</u> = Total Cover

**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

2 - Dominance Test is >50%

\_\_\_ 3 - Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_ 5 - Wetland Non-Vascular Plants<sup>1</sup>

\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

<b>Hydrophytic Vegetation Present?</b>	Yes <input checked="" type="checkbox"/> No _____
--	--

Remarks:

**SOIL**

Sampling Point: TP-5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)										
Depth (inches)	Matrix		Redox Features				Texture	Remarks		
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>				
0-8	10YR 3/2	100						Silty loam w/ gravel		
8-15	10YR 4/3	97	7.5YR 2.4/6	1	C	M		Silty loam w/ gravel		
			5YR 3/4	2	C	M				
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.										
<b>Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)</b>					<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>					
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)				<input type="checkbox"/> 2 cm Muck (A10)					
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)				<input type="checkbox"/> Red Parent Material (TF2)					
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)				<input type="checkbox"/> Very Shallow Dark Surface (TF12)					
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)				<input type="checkbox"/> Other (Explain in Remarks)					
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)				<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.					
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)									
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)									
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)									
<b>Restrictive Layer (if present):</b>										
Type: _____					Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/>					
Depth (inches): _____										
Remarks:										

**HYDROLOGY**

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)		
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)		
<b>Field Observations:</b>		
Surface Water Present? Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water Table Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>8"</u>	
Saturation Present? Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>7"</u>	
(includes capillary fringe)		
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____		
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

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

Project/Site: Chain Lk Rd City/County: Monroe/Snohomish Sampling Date: 01/22/18  
 Applicant/Owner: Michael Suschick State: WA Sampling Point: TP-6  
 Investigator(s): KAM/AER Section, Township, Range: S31 T28NW R06E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOXU gravelly medial loam NWI classification: \_\_\_\_\_

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

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No _____	<b>Is the Sampled Area within a Wetland?</b> Yes _____ No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes _____	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes _____	No <input checked="" type="checkbox"/>	
Remarks:			

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>0</u> = Total Cover				
Herb Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>lawn (unid grasses)</u>	<u>100</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
2. <u>creeping buttercup</u>	<u>60</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
3. <u>vetch (Vicia americana)</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>	
4. <u>soft rush</u>	<u>5</u>	_____	<u>FACW</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>185</u> = Total Cover				
Woody Vine Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				
Remarks:				

**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

2 - Dominance Test is >50%

\_\_\_ 3 - Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_ 5 - Wetland Non-Vascular Plants<sup>1</sup>

\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

**Hydrophytic Vegetation Present?** Yes  No \_\_\_\_\_



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

Project/Site: Chain CK Rd City/County: Marion/Snohomish Sampling Date: 01/22/18  
 Applicant/Owner: Michael Snschuck State: WA Sampling Point: TP-7  
 Investigator(s): KAM/AEK Section, Township, Range: S31 T28N W R06E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOXU gravelly medial loam NWI classification: \_\_\_\_\_  
 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 \_\_\_\_\_ 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 <u>X</u> No _____	<b>Is the Sampled Area within a Wetland?</b>	Yes _____ No <u>X</u>
Hydric Soil Present?	Yes _____ No <u>X</u>		
Wetland Hydrology Present?	Yes <u>X</u> No _____		
Remarks:			

**VEGETATION – Use scientific names of plants.**

Tree Stratum (Plot size: <u>10'</u> )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. _____				Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. _____				Total Number of Dominant Species Across All Strata: <u>3</u> (B)
3. _____				Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
4. _____				
Sapling/Shrub Stratum (Plot size: <u>10'</u> ) <u>0</u> = Total Cover				<b>Prevalence Index worksheet:</b> 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 = _____
Herb Stratum (Plot size: <u>10'</u> ) <u>0</u> = Total Cover				<b>Hydrophytic Vegetation Indicators:</b> ___ 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 <sup>1</sup> ___ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ 5 - Wetland Non-Vascular Plants <sup>1</sup> ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>velvet grass</u>	<u>40</u>	<u>X</u>	<u>FAC</u>	
2. <u>unaid grass (lawn)</u>	<u>90</u>	<u>X</u>	<u>FAC</u>	
3. <u>creeping buttercup</u>	<u>20</u>	<u>X</u>	<u>FACW</u>	
4. <u>Rubus (curly docks)</u>	<u>2</u>		<u>FAC</u>	
5. <u>reed canarygrass</u>	<u>10</u>		<u>FACW</u>	
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
Woody Vine Stratum (Plot size: <u>10'</u> ) _____ = Total Cover				<b>Hydrophytic Vegetation Present?</b> Yes <u>X</u> No _____
1. _____				
2. _____				
% Bare Ground in Herb Stratum <u>0</u> = Total Cover				
Remarks:				

**SOIL**

Sampling Point: TP-7

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/3	100					loam	
4-15	10YR 4/3	100					loam	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

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

**Restrictive Layer (if present):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

**Field Observations:**

Surface Water Present?	Yes _____ No <input checked="" type="checkbox"/>	Depth (inches): _____	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No _____
Water Table Present?	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>12"</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No _____	Depth (inches): <u>10"</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			

Remarks:

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

Project/Site: Chan LK Rd City/County: Monroe/Snohomish Sampling Date: 01/22/18  
 Applicant/Owner: Michael Buschick State: WA Sampling Point: TP-8  
 Investigator(s): KAM/AEP Section, Township, Range: S31 T28NW R06E  
 Landform (hillslope, terrace, etc.): none Local relief (concave, convex, none): none Slope (%): \_\_\_\_\_  
 Subregion (LRR): A Lat: \_\_\_\_\_ Long: \_\_\_\_\_ Datum: \_\_\_\_\_  
 Soil Map Unit Name: TOKUI gravelly medial loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No \_\_\_\_\_ (If no, explain in Remarks.)  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes \_\_\_\_\_ No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____ Hydric Soil Present? Yes _____ No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes _____ No <input checked="" type="checkbox"/>
Remarks: _____	

**VEGETATION – Use scientific names of plants.**

Stratum	Plot size	Absolute % Cover	Dominant Species?	Indicator Status		
<b>Tree Stratum</b> (Plot size: <u>10'</u> )						
1.						
2.						
3.						
4.						
		<u>0</u>	= Total Cover			
<b>Sapling/Shrub Stratum</b> (Plot size: <u>10'</u> )						
1.						
2.						
3.						
4.						
5.						
		<u>0</u>	= Total Cover			
<b>Herb Stratum</b> (Plot size: <u>10'</u> )						
1.	<u>Velvet grass</u>	<u>20</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		
2.	<u>wild grass (lawn)</u>	<u>90</u>	<input checked="" type="checkbox"/>	<u>FAC</u>		
3.	<u>wild canarygrass</u>	<u>30</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
4.	<u>soft rush</u>	<u>10</u>		<u>FACW</u>		
5.	<u>creeping buttercup</u>	<u>70</u>	<input checked="" type="checkbox"/>	<u>FACW</u>		
6.						
7.						
8.						
9.						
10.						
11.						
		<u>220</u>	= Total Cover			
<b>Woody Vine Stratum</b> (Plot size: <u>10'</u> )						
1.						
2.						
		<u>0</u>	= Total Cover			
<b>% Bare Ground in Herb Stratum</b>		<u>0</u>				

**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:**

\_\_\_ 1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

\_\_\_ 3 - Prevalence Index is ≤3.0<sup>1</sup>

\_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

\_\_\_ 5 - Wetland Non-Vascular Plants<sup>1</sup>

\_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

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

**Hydrophytic Vegetation Present?** Yes  No \_\_\_\_\_

Remarks: \_\_\_\_\_

**SOIL**

Sampling Point: TP-8

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	10YR 2/1	100					silty loam w/ gravel	
5-9	10YR 3/3	100					silty loam w/ gravel	
9-16	10YR 2/1	50					↓ w/ charcoal	
	10YR 3/3	50						w/ charcoal

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

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

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

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes \_\_\_\_\_ No X

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

**Field Observations:**

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

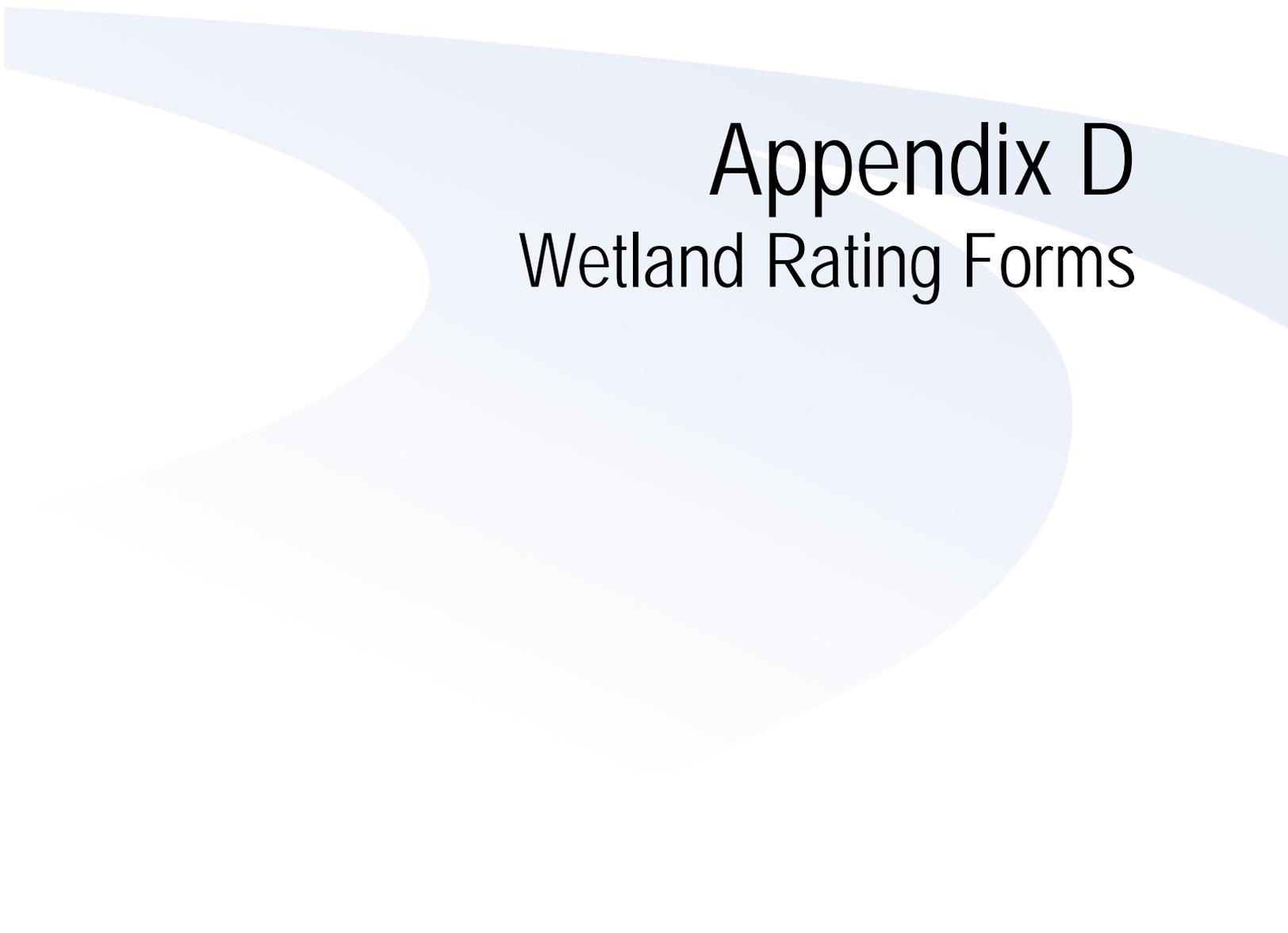
Water Table Present? Yes X No \_\_\_\_\_ Depth (inches): 2"

Saturation Present? (includes capillary fringe) Yes X No \_\_\_\_\_ Depth (inches): 0"

**Wetland Hydrology Present?** Yes X No \_\_\_\_\_

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

Remarks:  
white roots

A light blue abstract graphic element consisting of several overlapping, rounded shapes that create a sense of depth and movement, primarily located in the lower half of the page.

# Appendix D

## Wetland Rating Forms

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for double-sided printing

Wetland name or number A

## RATING SUMMARY – Western Washington

Name of wetland (or ID #): Chain Lake Rd - Wet. A Date of site visit: 1/22/18  
 Rated by Kerrie McArthur Trained by Ecology?  Yes  No Date of training 6/2014  
 HGM Class used for rating Depressional Wetland has multiple HGM classes?  Y  N

**NOTE: Form is not complete without the figures requested (figures can be combined).**  
 Source of base aerial photo/map ESRI 2015

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

### 1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
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)	<b>TOTAL</b>
Score Based on Ratings	7	5	5	17

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

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

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

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

Wetland name or number A

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

### Depressional Wetlands

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

### Riverine Wetlands

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

### Lake Fringe Wetlands

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

### Slope Wetlands

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

## HGM Classification of Wetlands in Western Washington

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

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

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

NO - go to 2

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

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

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

YES - **Freshwater Tidal Fringe**

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

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

NO - go to 3

YES - The wetland class is **Flats**

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

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

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

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

NO - go to 4

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

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

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

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

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

NO - go to 5

YES - The wetland class is **Slope**

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

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

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

The overbank flooding occurs at least once every 2 years.

Wetland name or number A

NO - go to 6

YES - The wetland class is **Riverine**

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

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

NO - go to 7

YES - The wetland class is **Depressional**

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

NO - go to 8

YES - The wetland class is **Depressional**

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

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

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	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

**DEPRESSIONAL AND FLATS WETLANDS**  
**Water Quality Functions - Indicators that the site functions to improve water quality**

<b>D 1.0. Does the site have the potential to improve water quality?</b>		
<b>D 1.1. Characteristics of surface water outflows from the wetland:</b>		
Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3		2
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2		
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1		
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1		
<b>D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0</b>		0
<b>D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes):</b>		
Wetland has persistent, ungrazed, plants > 95% of area points = 5		5
Wetland has persistent, ungrazed, plants > 1/2 of area points = 3		
Wetland has persistent, ungrazed plants > 1/10 of area points = 1		
Wetland has persistent, ungrazed plants < 1/10 of area points = 0		
<b>D 1.4. Characteristics of seasonal ponding or inundation:</b>		
<i>This is the area that is ponded for at least 2 months. See description in manual.</i>		
Area seasonally ponded is > 1/2 total area of wetland points = 4		2
Area seasonally ponded is > 1/4 total area of wetland points = 2		
Area seasonally ponded is < 1/4 total area of wetland points = 0		
<b>Total for D 1</b>		<b>9</b>

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

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

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

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

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

Wetland name or number A

<b>DEPRESSIONAL AND FLATS WETLANDS</b>		
<b>Hydrologic Functions - Indicators that the site functions to reduce flooding and stream degradation</b>		
<b>D 4.0. Does the site have the potential to reduce flooding and erosion?</b>		
<b>D 4.1. Characteristics of surface water outflows from the wetland:</b> Wetland is a depression or flat depression with no surface water leaving it (no outlet) points = 4 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet points = 2 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch points = 1 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 0		2
<b>D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.</b> Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7 Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5 Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3 The wetland is a "headwater" wetland points = 3 Wetland is flat but has small depressions on the surface that trap water points = 1 Marks of ponding less than 0.5 ft (6 in) points = 0		3
<b>D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</b> The area of the basin is less than 10 times the area of the unit points = 5 The area of the basin is 10 to 100 times the area of the unit points = 3 The area of the basin is more than 100 times the area of the unit points = 0 Entire wetland is in the Flats class points = 5		0
<b>Total for D 4</b>		5
<b>Rating of Site Potential</b> If score is: <u>12-16 = H</u> <u>6-11 = M</u> <input checked="" type="checkbox"/> <u>0-5 = L</u> <span style="float: right;">Record the rating on the first page</span>		
<b>D 5.0. Does the landscape have the potential to support hydrologic functions of the site?</b>		
<b>D 5.1. Does the wetland receive stormwater discharges?</b> Yes = 1 No = 0		1
<b>D 5.2. Is &gt;10% of the area within 150 ft of the wetland in land uses that generate excess runoff?</b> Yes = 1 No = 0		0
<b>D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at &gt;1 residence/ac, urban, commercial, agriculture, etc.)?</b> Yes = 1 No = 0		1
<b>Total for D 5</b>		2
<b>Rating of Landscape Potential</b> If score is: <u>3 = H</u> <input checked="" type="checkbox"/> <u>1 or 2 = M</u> <u>0 = L</u> <span style="float: right;">Record the rating on the first page</span>		
<b>D 6.0. Are the hydrologic functions provided by the site valuable to society?</b>		
<b>D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.</b> The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): <ul style="list-style-type: none"> <li>• Flooding occurs in a sub-basin that is immediately down-gradient of unit. points = 2</li> <li>• Surface flooding problems are in a sub-basin farther down-gradient. points = 1</li> </ul> Flooding from groundwater is an issue in the sub-basin. points = 1  The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why _____ points = 0  There are no problems with flooding downstream of the wetland. points = 0		1
<b>D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</b> Yes = 2 No = 0		0
<b>Total for D 6</b>		1
<b>Rating of Value</b> If score is: <u>2-4 = H</u> <input checked="" type="checkbox"/> <u>1 = M</u> <u>0 = L</u> <span style="float: right;">Record the rating on the first page</span>		

Wetland name or number A

**These questions apply to wetlands of all HGM classes.**  
**HABITAT FUNCTIONS - Indicators that site functions to provide important habitat**

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

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

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

0

**H 1.2. Hydroperiods**

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

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

/

**H 1.3. Richness of plant species**

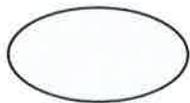
Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup>.  
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*

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

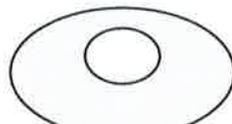
/

**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.*



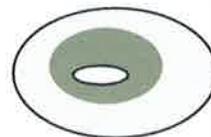
None = 0 points



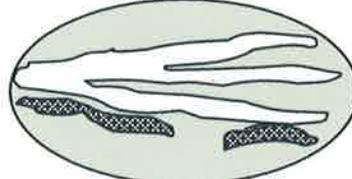
Low = 1 point



Moderate = 2 points



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



0

Wetland name or number A

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

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

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>		
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p><i>Calculate:</i> % undisturbed habitat <u>25</u> + [(% moderate and low intensity land uses)/2] <u>20.5</u> = <u>49.5</u> %</p> <p>If total accessible habitat is:</p> <p>&gt; 1/3 (33.3%) of 1 km Polygon <span style="float: right;">points = 3</span></p> <p>20-33% of 1 km Polygon <span style="float: right;">points = 2</span></p> <p>10-19% of 1 km Polygon <span style="float: right;">points = 1</span></p> <p>&lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>		3
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p><i>Calculate:</i> % undisturbed habitat <u>25</u> + [(% moderate and low intensity land uses)/2] <u>22.5</u> = <u>47.5</u> %</p> <p>Undisturbed habitat &gt; 50% of Polygon <span style="float: right;">points = 3</span></p> <p>Undisturbed habitat 10-50% and in 1-3 patches <span style="float: right;">points = 2</span></p> <p>Undisturbed habitat 10-50% and &gt; 3 patches <span style="float: right;">points = 1</span></p> <p>Undisturbed habitat &lt; 10% of 1 km Polygon <span style="float: right;">points = 0</span></p>		1
<p>H 2.3. Land use intensity in 1 km Polygon: If <u>30%</u></p> <p>&gt; 50% of 1 km Polygon is high intensity land use <span style="float: right;">points = (- 2)</span></p> <p>≤ 50% of 1 km Polygon is high intensity <span style="float: right;">points = 0</span></p>		0
Total for H 2	Add the points in the boxes above	4

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

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

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

Wetland name or number A

## WDFW Priority Habitats

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

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

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

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

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

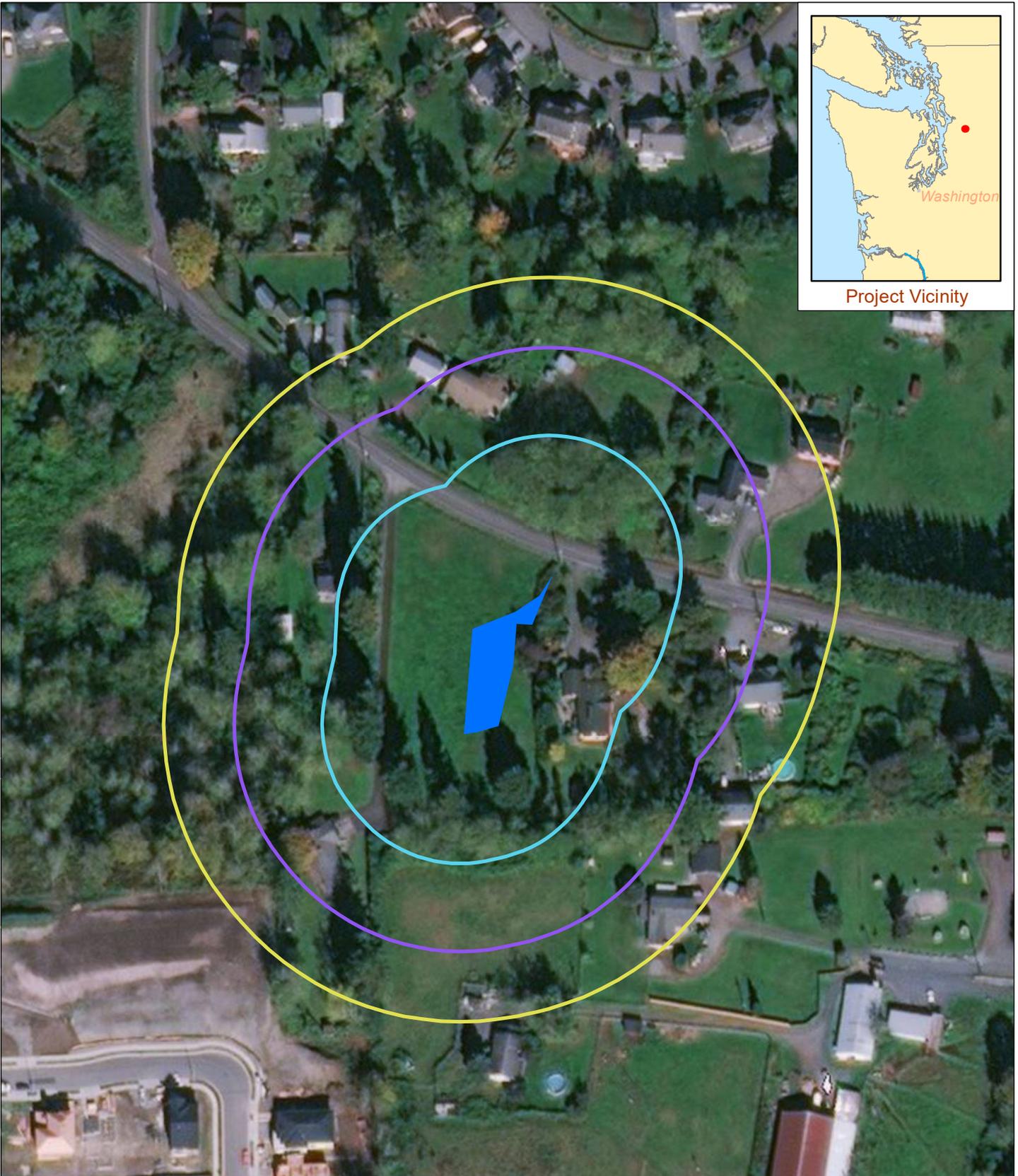
### CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
<b>SC 1.0. Estuarine wetlands</b> Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <p style="text-align: right;">Yes – Go to <b>SC 1.1</b>    No = <b>Not an estuarine wetland</b></p>	
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? <p style="text-align: right;">Yes = <b>Category I</b>    No - Go to <b>SC 1.2</b></p>	<b>Cat. I</b>
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <p style="text-align: right;">Yes = <b>Category I</b>    No = <b>Category II</b></p>	<b>Cat. I</b>  <b>Cat. II</b>
<b>SC 2.0. Wetlands of High Conservation Value (WHCV)</b> SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? <p style="text-align: right;">Yes – Go to <b>SC 2.2</b>    No – Go to <b>SC 2.3</b></p> SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <p style="text-align: right;">Yes = <b>Category I</b>    No = <b>Not a WHCV</b></p> SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? <a href="http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf">http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf</a> <p style="text-align: right;">Yes – <b>Contact WNHP/WDNR and go to SC 2.4</b>    No = <b>Not a WHCV</b></p> 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? <p style="text-align: right;">Yes = <b>Category I</b>    No = <b>Not a WHCV</b></p>	<b>Cat. I</b>
<b>SC 3.0. Bogs</b> Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i> 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? <p style="text-align: right;">Yes – Go to <b>SC 3.3</b>    No – Go to <b>SC 3.2</b></p> 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? <p style="text-align: right;">Yes – Go to <b>SC 3.3</b>    No = <b>Is not a bog</b></p> 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? <p style="text-align: right;">Yes = <b>Is a Category I bog</b>    No – Go to <b>SC 3.4</b></p> <p><b>NOTE:</b> If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.</p> 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? <p style="text-align: right;">Yes = <b>Is a Category I bog</b>    No = <b>Is not a bog</b></p>	<b>Cat. I</b>

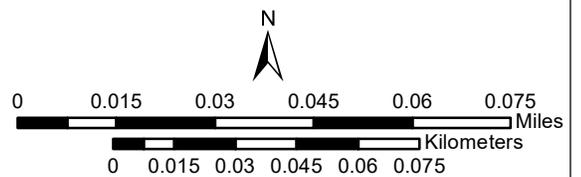


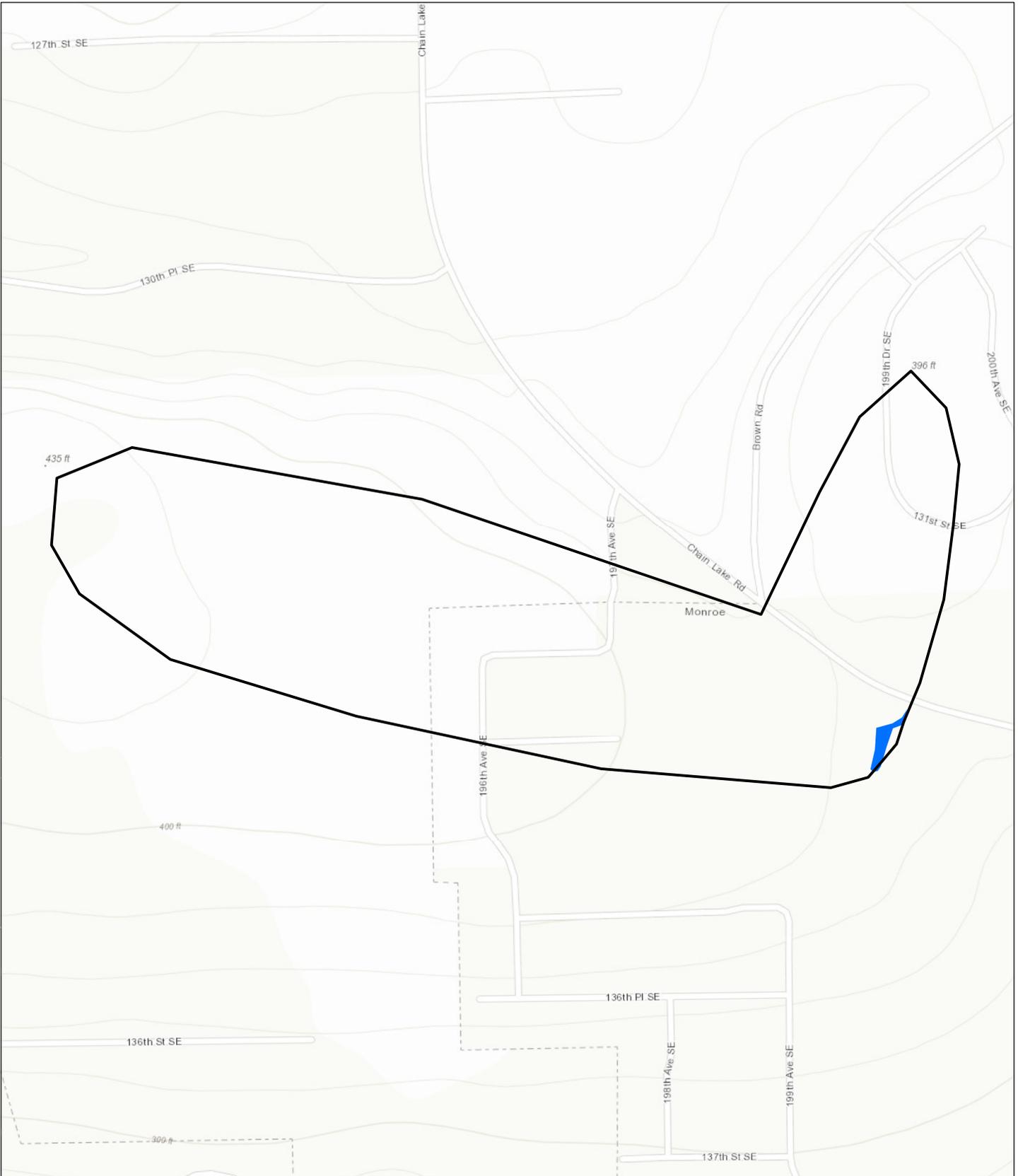
Wetland name or number \_\_\_\_\_

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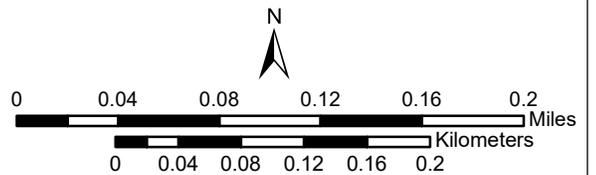


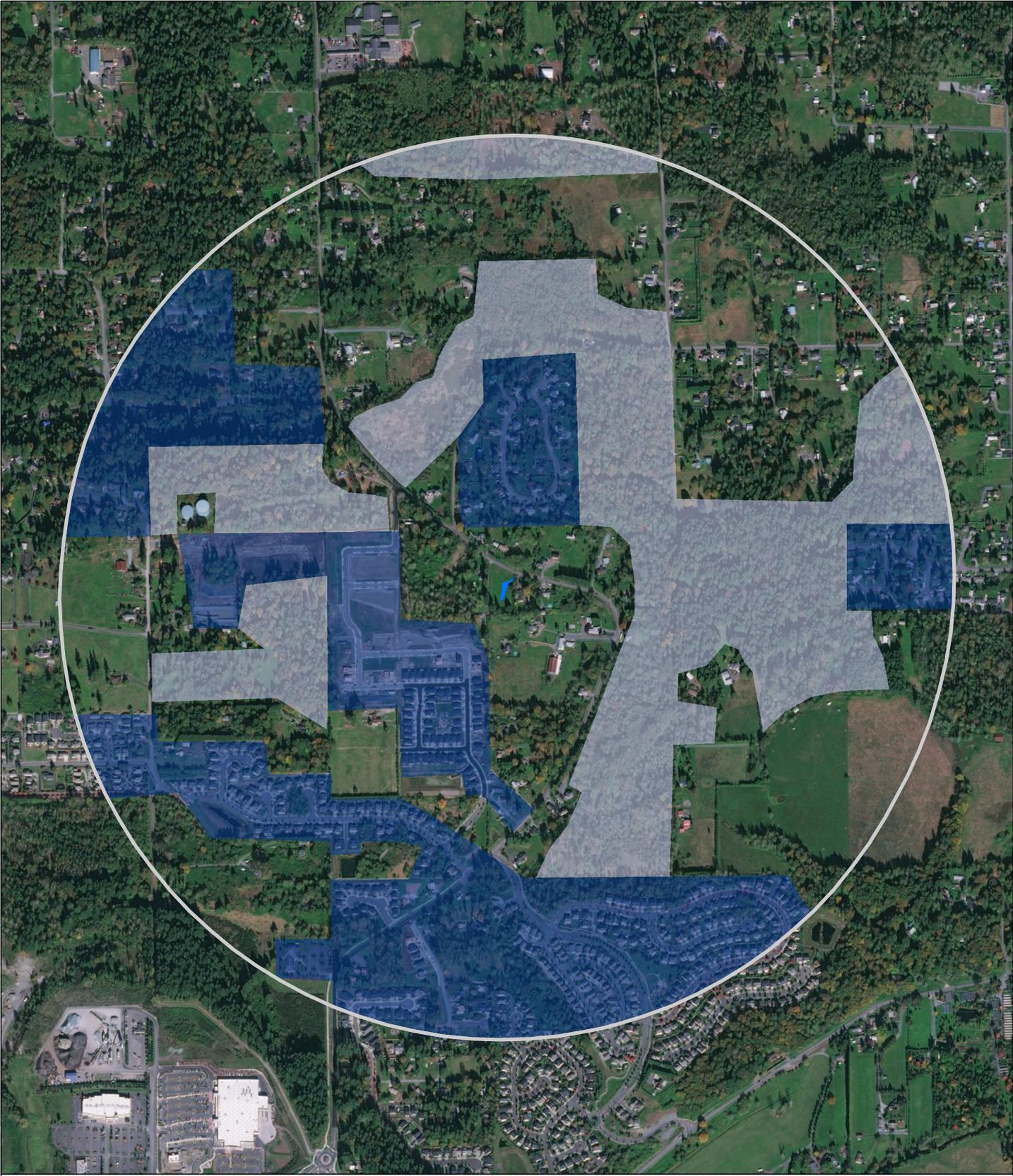
-  Wetland A Boundary
-  330 ft Buffer
-  250 ft Buffer
-  150 ft Buffer



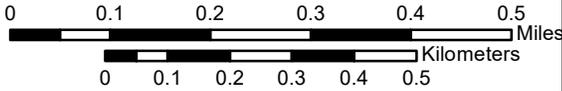


 Wetland A Boundary  
 Contributing Basin





-  Wetland A Boundary
-  1 km Buffer
-  High Intensity Land Use
-  Undisturbed Land Use
-  Low/Moderate Land Use



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Alert

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# Water Quality improvement projects

This page gives an overview of water quality improvement projects — including total maximum daily loads (TMDLs) — in Washington. Projects are listed by county.

Each listing gives general information on waterbody, what pollutants are being dealt with, status of the project, and contact information in case you have questions.

*Note:* This is a partial list of the water quality improvement projects. A full directory will be developed.

## Get more information and data

Links provide more information by taking you to publications related to the project, or to the Water Quality Atlas, or to a project page as appropriate.

If more information is available about a project, it will be hyperlinked to the water body name. Use our [Water Quality Assessment Query Tool](#) to get data about water bodies.

## Read reports on improvement projects

To see water quality improvement reports, see the [Water Cleanup Plans](#) in our publications database.

# I want to...

[Skip to main content](#)

View the current EPA-approved water quality assessment

Explore the status of water bodies in our Water Quality Atlas mapping tool

## Water quality improvement projects

County	Waterbody Name	Pollutant(s)	Status	TMDL Lead (s)
Adams Lincoln Whitman	<a href="#">Palouse</a>	Dissolved oxygen Fecal Coliform PCBs Temperature Toxics	Under development EPA approved Has an implementation plan	<a href="#">Elaine Snouwaert</a> 509-329-3503
Clark	<a href="#">East Fork Lewis River</a>	Fecal Coliform Temperature	Under development	<a href="#">Andrew Kolosseus</a> 360-407-7543
Grays Harbor	<a href="#">North Ocean Beaches</a>		Under development	<a href="#">Donovan Gray</a>

County	Waterbody Name	Pollutant(s)	Status	TMDL Lead (s)
<a href="#">Skip to main content</a>		Shellfish Closure Response  Fecal Coliform Bacteria source investigation study		360-407-6407
King	<a href="#">Sammamish River and Tributaries</a>	Dissolved Oxygen Temperature	Under Development	<a href="#">Joan Nolan</a> 425-649-4425
King	<a href="#">Soos Creek Subbasin Multiparameter</a>	Aquatic Habitat Dissolved Oxygen Temperature	Under Development	<a href="#">Joan Nolan</a> 425-649-4425
King	<a href="#">Soos Creek Subbasin Bacteria</a>	Fecal Coliform	Under Development	<a href="#">Joan Nolan</a> 425-649-4425
Mason	<a href="#">Cranberry, Johns, and Mill Creeks</a>	Temperature	Under development	<a href="#">Betsy Dickes</a> 360-407-6296
Pend Oreille	<a href="#">Little Spokane River</a>	Dissolved Oxygen pH	Under development	<a href="#">Elaine Snouwaert</a>

County	Waterbody Name	Pollutant(s)	Status	TMDL Lead (s)
<a href="#">Skip to main content</a>				
Spokane Stevens				509-329-3503
Pierce	<a href="#">Clover Creek</a>	Dissolved Oxygen Fecal Coliform Temperature	Water Quality Assessment project  Under development	<a href="#">Donovan Gray</a> 360-407-6407
Skagit	<a href="#">Padilla Bay</a>	Fecal coliform	Under development	<a href="#">Danielle DeVoe</a> 425-649-7036
Snohomish	<a href="#">French and Pilchuck Creeks</a>	Dissolved Oxygen Temperature	Under development	<a href="#">Heather Khan</a> 425-649-7003
Spokane	<a href="#">Hangman Creek</a>	Fecal Coliform Temperature Turbidity	Approved Implementation plan sent to EPA	<a href="#">Elaine Snouwaert</a> 509-329-3503
Spokane	<a href="#">Spokane River</a>	Dissolved Oxygen PCB  Toxics		<a href="#">Karin Baldwin</a> 509-329-3601  <a href="#">Adriane Borgias</a>

County	Waterbody Name	Pollutant(s)	Status	TMDL Lead (s)
<a href="#">Skip to main content</a>				
				509-329-3515
Thurston	<a href="#">Deschutes River and tributaries</a>	Dissolved Oxygen Fecal Coliform pH Sediment Temperature	Submitted to EPA for approval	<a href="#">Leanne Weiss</a> 360-407-0243
Thurston	<a href="#">Deschutes Watershed: Budd Inlet</a>	Dissolved Oxygen Phosphorus	Under development	<a href="#">Leanne Weiss</a> 360-407-0243
Thurston	<a href="#">Henderson Inlet</a>	Dissolved Oxygen Fecal Coliform pH Temperature	EPA approved Has an implementation plan	<a href="#">Donovan Gray</a> 360-407-6407
Whatcom	<a href="#">Lake Whatcom Watershed Multiparameter</a>	Dissolved Oxygen Fecal Coliform Phosphorus	EPA approved	<a href="#">Steve Hood</a> 360-715-5211
Yakima	<a href="#">Mid-Yakima Basin</a>	Bacteria	Under development	<a href="#">Greg Bohn</a> 509-454-4174
Yakima		Toxics		

County	Waterbody Name	Pollutant(s)	Status	TMDL Lead (s)
<a href="#">Skip to main content</a>	<a href="#">Yakima River Basin</a>		Under development	<a href="#">Jane Creech</a> 509-454-7860

## Related links

- [Water Quality Atlas](#)
- [Water Quality Assessment Tracking System](#)

## Contact information

Diane Dent

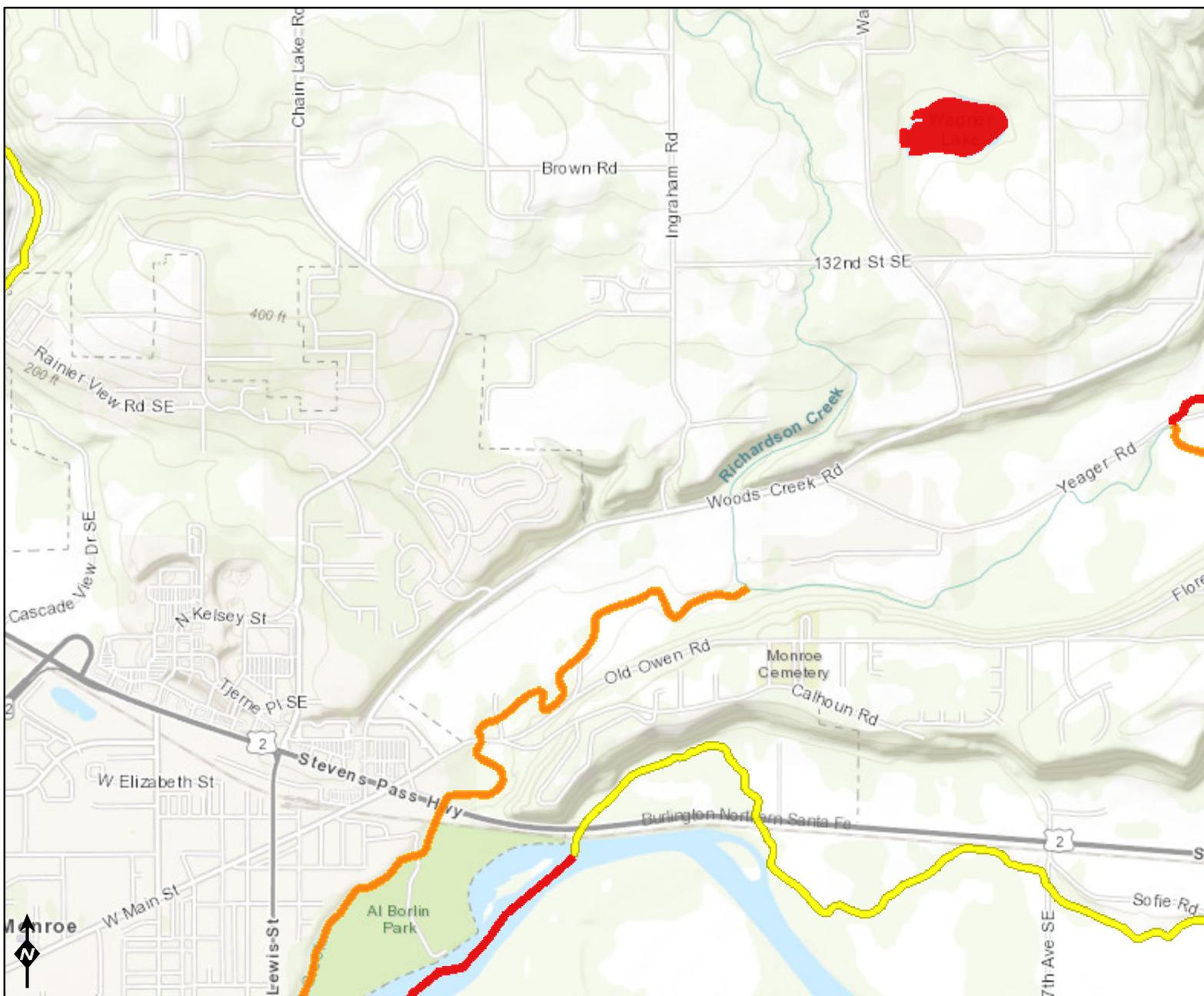
Water Quality Program

[diane.dent@ecy.wa.gov](mailto:diane.dent@ecy.wa.gov)

360-407-6616

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# Water Quality Atlas Map



## Assessed Waters/Sediment

### Water

- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

### Sediment

- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

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A light blue abstract graphic element consisting of several overlapping, rounded shapes that create a sense of depth and movement, primarily located in the lower half of the page.

# Appendix E

## Site Photographs

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Photo 1 — Water ponding in central portion of property.



Photo 2 — View north from TP-1 of Wetland A.



Photo 3 — View east from TP-2 of Wetland A.



Photo 4 — Upland area in northern portion of property.



Photo 5 — Transition from southern wetland boundary to upland.



Photo 6 — Wetland A continues off-site to the east.



Photo 7 — Soils at TP-1.



Photo 8 — Soils at TP-2.



Photo 9 — Soils at TP-3.



Photo 10 — Soils at TP-4.



Photo 11 — Soils at TP-5.



Photo 12 — Soils at TP-6.



Photo 13 — Soils at TP-7.



Photo 14 — Soils at TP-8.

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