WETLAND DELINEATION

Issaquah-Pine Lake Road SE, Sammamish, WA 98029

Parcels 1524069069 & 1524069062

April 8, 2022

Prepared for:

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1.0 INTRODUCTION

The property owners are considering a short plat on tax parcels 1524069062 and 1524069069 located in the city of Sammamish, Washington. This report is intended to assist in the planning and assessment for meeting the requirements of the Sammamish Critical Areas Ordinance (Sammamish Development Code, Chapter 21.03). An initial reconnaissance of the property was conducted on February 5, 2022. The wetland delineation occurred on March 26, 2022. This wetland delineation is subject to agency verification and approval.

1.1 SITE LOCATION

The study area is located on the east side of Issaquah-Pine Lake Road SE, between SE 47th Way and SE 48th Street in the City of Sammamish (**Figure 1**). Parcel 1524069062 is 1.28 acres; parcel 1524069069 is 5.41 acres. The property is mostly undeveloped forest and wetlands. A structure near Issaquah-Pine Lake Road SE has been removed; the foundation is still visible. The parcels adjoin a private park and pond on the north, single family homes on the east, undeveloped forest and wetlands on the south, and Issaquah-Pine Lake Road SE and a retaining wall on the west. Only the northwest wetland boundary was delineated. The remaining wetland boundaries were estimated based on observations during the February 5, 2022 reconnaissance, as well as topography and aerial photo interpretation.

2.0 METHODS

2.1 OFFICE ASSESSMENT

The following documents were reviewed to aid identification and determination of wetlands in the project vicinity:

- King County iMap (website accessed February 2022)
- City of Sammamish Property Tool (website accessed February 2022)
- National Wetlands Inventory Map (USFWS Wetland Mapper Website accessed February 2022)
- U.S. Geological Service (USGS) Topographic Quadrangles
- Washington State Wetland Plant List (Lichvar, revised 2016)
- Soil Survey of King County Area, Washington (NRCS Web Soil Survey, accessed February 2022)
- Washington Department of Fish and Wildlife interactive mapper (accessed February 2022)
- Washington Department of Fish and Wildlife Priority Habitats and Species online mapper (accessed February 2022)
- Aerial photographs publicly available via the internet

2.2 WETLAND DELINEATION

A wetland delineation was made on-site by a Professional Wetland Scientist (PWS) following the standard protocol outlined in the following manuals:

- U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (USACE 1987)
- *USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, Version 2.0* (hereafter referred to as the "2010 *Regional Supplement*"); (USACE 2010)

The 2010 *Regional Supplement* provides technical guidance and procedures specific to the non-arid west. To maintain consistency between the state and federal delineations of wetlands, the Washington State Department of Ecology (Ecology) has repealed WAC 173-22-080 (the state delineation manual), and replaced it with a revision of WAC 173-22-035 that states delineations should be completed according to the currently approved federal manual and supplements (the 2010 *Regional Supplement*). The changes were effective March 14, 2011.

For regulatory purposes, wetlands are distinguished from uplands using hydrology, soil, and vegetative characteristics, or "indicators" as the manuals refer to them. A wetland requires "inundation or soil saturation long enough during the growing season to create an anaerobic condition sufficient to alter chemical and biological activity in the soil, soil microbes, and rooted vegetation" (USACE 1987). This anaerobic condition manifests itself via characteristics, or indicators, present in the soil profile and adaptations in the vegetative community.

The growing season is technically defined as the period when soil temperatures 12 inches below the ground surface (bgs) are greater than 5°C (41°F), according to the 2010 *Regional Supplement*. The 2010 *Regional Supplement* and the Ecology manual also state that the determination of growing season should take into account careful observations of evidence that active plant growth is occurring. This evidence can include new or recent growth such as flowers, new shoots, new leaves, or swollen buds on plants. In the absence of active plant growth observations, the length of the growing season may be approximated by the beginning and ending dates of 28° F temperatures with 50 percent probability as estimated by the Natural Resource Conservation Service (NRCS). The estimated growing season for the study area occurs from **March 9 to November 17** (a total of 253 days) using NRCS WETS data for Snoqualmie Falls, Washington (NRCS 2022b) (approximately 9 miles east). The delineation occurred in the growing season.

Four recorded sample plots (SP-1 to SP-4) were used to investigate the study area (**Appendix A**). The sample plots are located in places that adequately represent the variation in vegetation, soils, and hydrologic regimes within the site. The presence or absence of hydrophytic vegetation, hydric soil, and wetland hydrology indicators were documented for each sample plot to justify the delineated wetland boundaries.

The wetland boundary was marked with pink "Wetland Delineation" flags labelled A-1 to A-20. Sample plots were marked with orange flags. Approximate locations of the sample plots and wetland boundary are shown on **Figure 2** on an aerial photo base. The wetland boundary is being professionally surveyed.

2.3 WETLAND HYDROLOGY

To determine whether a vegetation community meets the wetland hydrology criterion, an area is examined for inundation, soil saturation, shallow groundwater tables, or other dry-season hydrology indicators defined in the 2010 *Regional Supplement*. An area in which soils are inundated or saturated within 12 inches of the soil surface continuously for at least 5 to 12.5 percent of the growing season meets the criterion for wetland hydrology per the 1987 Wetland Delineation Manual and Ecology's manual. The requirement per the 2010 *Regional Supplement* is 14 days of continuous saturation or inundation.

Seasonal changes in water levels and the effect of recent precipitation events must be considered when evaluating an area's hydrology, particularly outside of the growing season or during the dry summer months. Wetland hydrology can be determined during the summer months by documenting the presence of one primary indicator (such as watermarks on vegetation, drift deposits, sediment deposits, surface-scoured areas, algal mats, and oxidized root channels) or two secondary indicators (such as water-stained leaves, drainage patterns, geomorphic position, shallow aquitard, or FAC-Neutral Test).

2.4 HYDRIC SOIL

Soil pits were dug at sample plot centers to 18 inches or more bgs. Soil color and other characteristics were used to distinguish hydric versus non-hydric soils. The Munsell Soil Color Chart (X-Rite 2009), the *Soil Survey of King County Area Washington* (NRCS 2022a), the 2010 *Regional Supplement*, and the *Field Indicators of Hydric Soils in the United States*, version 8.0 (NRCS 2016) aided in the determinations.

2.5 HYDROPHYTIC VEGETATION

Sample plot centers were situated so that the plots best represented the vegetation present within the wetland or upland near the plot location. Plant species and their percent cover were recorded for each vegetative stratum generally using a 30-foot radius for trees, a 15-foot radius for shrubs, and a 5 foot radius for herbaceous plants and woody vines. Each species' wetland indicator status was recorded based on its listing in the Wetland Plant List (Lichvar et al. 2016). The plot's hydrophytic vegetation status was calculated per the delineation manual methods to determine whether a sample plot met the wetland vegetation criteria.

2.6 WETLAND RATING, CLASSIFICATION AND FUNCTIONS ASSESSMENT

Wetlands were classified using both the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) and the hydrogeomorphic (HGM) classification. A wetland rating was completed for each wetland using the *Washington State Wetland Rating*

System for Western Washington Revised (Ecology Rating System) (Hruby 2014). Ecology recognizes four categories of wetlands based on their sensitivity to disturbance, rarity, the functions they provide, and difficulty of replacement. Rating forms are located in **Appendix B**. A wetland scientist visited the wetland and determined wetland classes and categories using field observations and resources utilized during the preliminary data review process. A qualitative functions assessment was also conducted for the wetlands based on the Ecology Wetland Ratings. Hydrology, water quality, and habitat functions were evaluated based on the scores on the rating forms and the scoring criteria listed in **Table 1.** The breakdown into low, medium, and high functional categories is based on guidance provided in Ecology's *Wetland Mitigation in Washington State Part 1* (Ecology et al. 2006).

Table 1. Wetland Functions Assessment Criteria

	Criteria[1]		
Wetland Functions	**Low Score**	**Moderate Score**	**High Score**
Water Quality Functions	3-5	6-7	8-9
Hydrology Functions	3-5	6-7	8-9
Habitat Functions	3-5	6-7	8-9

[1]Low, medium and high breakdown based on Ecology guidance in the *Wetland Mitigation in Washington State Part 1* (Ecology et. al 2006), modified for the 2014 version of the rating system.

3.0 RESULTS

3.1 SITE DESCRIPTION

The study area occurs on a glacial drift plain and glacially modified foothills (up to 15 percent slopes) at elevations of approximately 365 to 380 feet. The wetland is in a large depression that has been partially impounded by 238th Way SE and beaver dams.

3.2 CLIMATE AND WATER

Climatic conditions for the study area vicinity are characterized by 62 inches of average annual rainfall, 40°F average winter air temperature, 62°F average summer air temperature, and typically about 185 frost-free days per year (NRCS 2022b). As with most of western Washington, the highest monthly precipitation occurs between October 1 and March 31, with April through September rainfall accounting for only about 28 percent of annual precipitation.

Antecedent precipitation compared to the normal range during the 90 days prior to the field visit is shown in Appendix C. Climatic/hydrologic conditions on the site were determined to be typical for the time of year.

Standing water was present throughout the wetland, augmented by active beaver dams. Upland plots were dry to at least 18 inches.

3.3 SOIL TYPES

According to the *Soil Survey of the King County Area Washington* (NRCS Web Soil Survey 2022a), two soil map units are mapped for the study area:

- (AgD) Alderwood gravelly sandy loam, 15 to 30 percent slopes. Alderwood is not a listed hydric soil. However, hydric soil inclusions in depressions and drainageways may make up approximately 5 percent of a map unit.

  Alderwood gravelly sandy loam consists of deep, moderately well drained soils formed in glacial drift and outwash over dense glaciomarine deposits. They occur on glacial drift plains. Typically they have an ash-influenced gravelly sandy loam surface layer that is 12 inches thick. The subsoil is very gravelly sandy loam. The substratum begins at 24 to 40 inches below the surface and is typically dense and/or cemented very gravelly sandy loam. Permeability of this layer is very low to moderately low. Water perches on this layer during the wet season, creating a seasonal high water table that is 18 to 37 inches below the surface.

  The non-hydric soils in the study area appear to be similar to the Alderwood soil. Hydric soil inclusions are deep, poorly drained soils with a depleted matrix below a dark surface layer.

- (SK) Seattle muck. This is a hydric soil.

  Seattle muck consists of deep, very poorly drained soils formed in herbaceous and woody deposits in depressions in glacial till plains. Typically, they have black or very dark brown, highly decomposed muck layers to 35 inches or more. Some layers are up to 25 percent wood fragments.

3.4 UPLAND VEGETATION COMMUNITIES

Dominant tree species in the forested uplands include western redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), big leaf maple (*Acer macrophylum*), red alder (*Alnus rubra*), bitter cherry (*Prunus emarginata*) and Sitka spruce (*Picea sitchensis*). Common shrubs include Indian plum (*Oemleria cerasiformis*), Himalayan blackberry (*Rubus armeniacus*), Oregon grape (*Mahonia nervosa*), salmonberry (*Rubus spectabilis*), trailing blackberry (*Rubus ursinus*), vine maple (*Acer circinatum*), red huckleberry (*Vaccinium parvifolium*), red elderberry (*Sambucus racemosa*), and salal (*Gaultheria shallon*). Herbaceous species in the understory include sword fern (*Polystichum munitum*) (others were not visible due to the time of year).

3.5 WETLAND INVENTORIES

The National Wetland Inventory (USFWS 2022), the King County wetland inventory (King County iMap 2022), and the City of Sammamish property tool all show a large wetland occupying the depression within the study area. The wetland is shown to extend from 238th Way SE on the north, to 240th Avenue SE on the south. Per the NWI mapping, it is over 15 acres and

contains forested, scrub-shrub and open water habitats. The King County inventory indicates that the wetland is rated as Category II.

3.6 WETLAND DELINEATION

Sample plots and check plots were observed in water-receiving locations on the landscape, such as toe slope positions and depressions. Wetland Determination Data forms are provided in **Appendix A**. Wetland Rating Forms are in **Appendix B**. Site photos are in **Appendix D**. Approximate wetland boundaries and sample plot locations are indicated on **Figure 2**. A professional survey of the wetland boundary will be provided separately. One wetland was observed, labeled Wetland A for purposes of this report.

Wetland A is a seasonally to permanently inundated depression that receives surface runoff from the surrounding slopes and stormwater flow (culvert under Issaquah-Pine Lake Road SE). The north end of the wetland (offsite) has been excavated to create a pond. Active beaver dams also function to increase water storage in the wetland. At high water, flow enters a culvert under 238th Way SE and discharges into a large emergent wetland on the north side of the road. Wetland A forms the headwaters of an unnamed tributary to Laughing Jacobs Creek (approximately 1 mile downstream). Laughing Jacobs Creek flows into Lake Sammamish.

The wetland extends offsite to the north, south and east. Total wetland area is estimated at approximately 15 acres. Wetland area on the two parcels within the study area is estimated at approximately 4.9 acres. Most of the upland area is concentrated on parcel #1524069062, and the northwest corner of parcel #1524069069. The wetland boundary was only delineated in this area.

Wetland A classifies as a palustrine forested, seasonally flooded wetland (PFOC), with smaller areas of scrub-shrub (SS) and emergent (EM) vegetation, and a permanently ponded area at its north end. The pond is estimated to provide up to three feet of storage during wet periods.

Dominant trees in the wetland include Pacific willow (*Salix lucida*), red alder, western redcedar, and Sitka spruce. Dominant shrubs in the understory and in the scrub-shrub vegetation includes Sitka willow (*Salix sitchensis*), red-osier dogwood (*Cornus alba*), black twinberry (*Lonicera involucrata*), and salmonberry. Dominant herbaceous species include water parsley (*Oenanthe sarmentosa*), creeping buttercup (*Ranunculus repens*), skunk cabbage (*Lysichitun americanum*), mannagrass (*Glyceria* species), and lady fern (*Athyrium cyclosorum*).

Wetland soils had a muck or mucky modified texture (SP-3), with the exception of areas more recently inundated due to beaver dams (SP-1).

Wetland A rates as a Category II wetland based on its functional score of 22 points. It rates high overall for water quality functions. Site potential is high due to the high proportion of the wetland that is both seasonally inundated and vegetated. Landscape potential is moderate since the wetland receives stormwater discharges. Value of the function to society is high since the wetland discharges to impaired waters downstream.

Wetland A also rates high overall for hydrologic functions. Site potential is high due to the depth of ponding and nature of the basin. Landscape potential is high since the wetland receives

stormwater discharges, and the contributing basin is highly developed. Value of the function to society is high since there is potential for flooding downstream.

Wetland A rates low overall for habitat functions. Site potential is high due to the diversity and interspersion of vegetation classes, hydroperiods, plant species and special habitat features (downed wood, snags, etc.). Landscape potential is low due to lack of accessible habitat and the extent of high intensity land uses near the site. Value of the function to society is low since there are no priority habitats nearby.

Per the Sammamish Development Code (21.03.020.Y.1.b), Wetland A has a standard buffer width of 100 feet. The Code allows for buffer averaging and/or buffer reduction on a case by case basis. Where approved, buffer averaging allows for up to 50 percent reduction of the buffer. Buffer reduction may be used when the buffer impacts are compensated for through mitigation. Various means of compensation are listed in the Code. Where approved, buffers may be reduced by up to 50 percent.

4.0 REFERENCES

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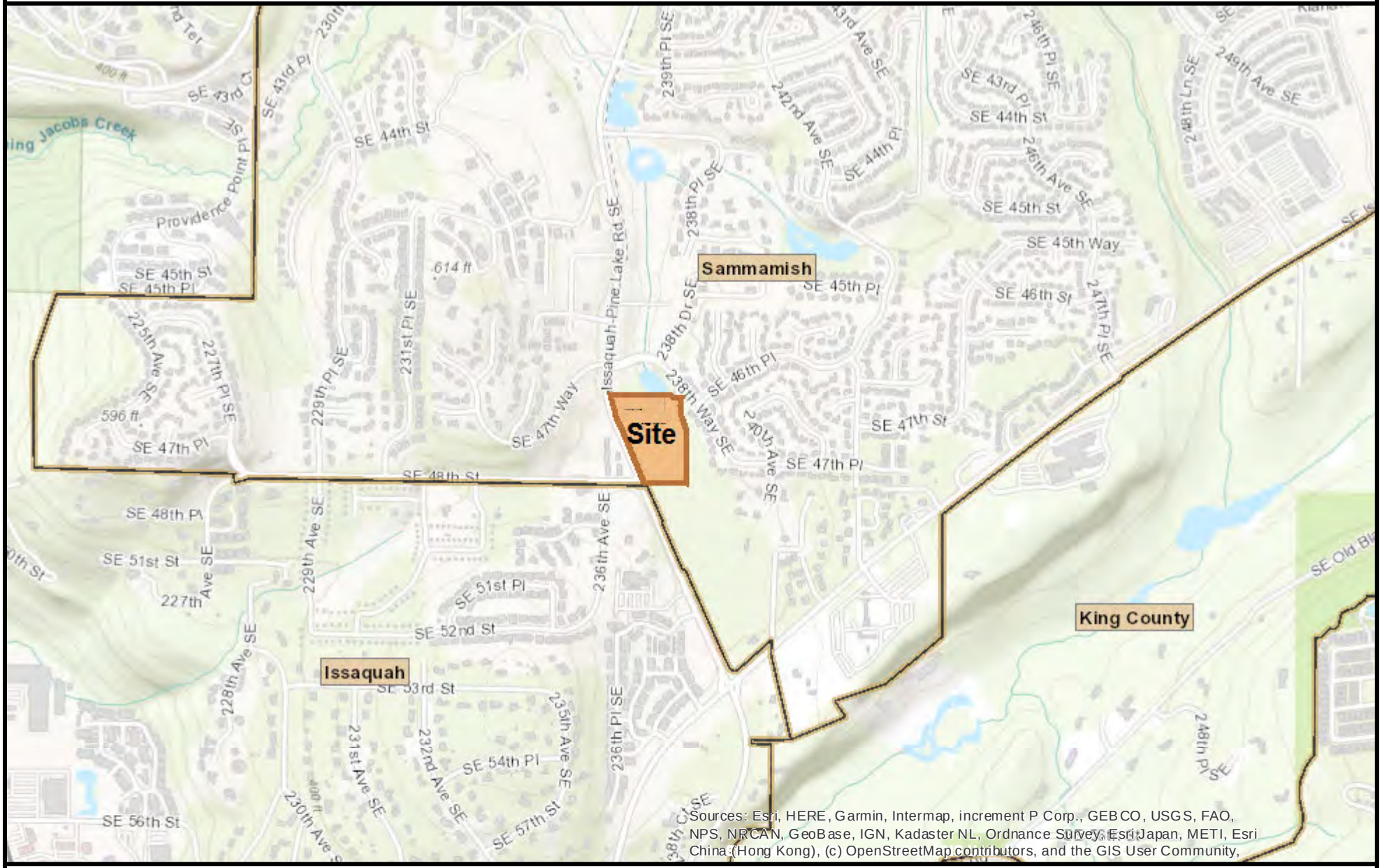
FIGURES

Figure 1: Vicinity Map



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N

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Figure 2: Approximate Wetland Boundaries

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Date: 4/3/2022 Paul Hamidi

APPENDIX A

Wetland Determination Data Sheets

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

Project/Site: Issaquah-Pine Lake Road City/County: Sammamish Sampling Date: 3-26-22
Applicant/Owner: Didonato State: WA Sampling Point: SP-1
Investigator(s): Hamidi Section, Township, Range:
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Seattle Muck NWI classification: PFO/EMC
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 X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No
Is the Sampled Area within a Wetland? Yes X No

Remarks:
West flag A-5
Photos 489-492

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30)			
1. Picea sitchensis	40	Y	FAC
2.			
3.			
4.			
	40 = Total Cover		
Sapling/Shrub Stratum (Plot size: 15)			
1. Cornus alba	10		FACW
2. Rubus armeniacus	20	Y	FAC
3.			
4.			
5.			
	30 = Total Cover		
Herb Stratum (Plot size: 5)			
1. Oenanthe sarmentosa	70	Y	OBL
2. Ranunculus repens	30	Y	FAC
3. Carex leptopoda	2		FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	52 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____

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

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: SP-A1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/1.5	100					L	
10-18	2.5Y 4/2	95	10YR 4/3	5	C	M	CL	20% gr.

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

beaver dam has raised water level
obligate Plants + Ponding

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 3" on plot

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

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

Wetland Hydrology Present? Yes X 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: Issaquah-Pine Lake Road City/County: Sammamish Sampling Date: 3-26-22

Applicant/Owner: Redmond State: WA Sampling Point: SP-2

Investigator(s): Hamidi Section, Township, Range:

Landform (hillslope, terrace, etc.): glacial drift plain Local relief (concave, convex, none): Convex Slope (%): 5

Subregion (LRR): A Lat: Long: Datum:

Soil Map Unit Name: Seattle Muck NWI classification: Upland

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

Remarks:
Photos 493-496 near flag A-5

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea sitchensis	30	Y	FAC
2. Thuja plicata	40	Y	FAC
3.			
4.			
	70	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus armeniacus	30	Y	FAC
2. Vaccinium parvifolium	5		FACU
3. Rubus spectabilis	20	Y	FAC
4.			
5.			
	55	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Polystichum munitum	15	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
		= Total Cover	

Woody Vine Stratum (Plot size: 15')			
1. Rubus ursinus	20	Y	FACU
2.			
	20	= Total Cover	

% Bare Ground in Herb Stratum Moss

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2-0	—						Duff	
0-6	10yR 3/2	100	—				SiL	
6-10	10yR 3/2	100	—				L	20% gr. 20% cobbles
10-18	10yR 4/3	100	—				L	30% cobbles 10% gr.

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

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

Project/Site: Issaquah-Pine Lake Road City/County: Sammamish Sampling Date: 3-26-22
Applicant/Owner: DeDonato State: WA Sampling Point: SP-3
Investigator(s): Hamid Section, Township, Range:
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Seattle MUCK NWI classification: PSSC
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 X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:
Photos 197-501 Near Flag A-11

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	20	Y	FAC
2.			
3.			
4.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1.			FACW
2. Rubus spectabilis	10		FAC
3. Lonicera involucrata	30	Y	FAC
4. Cornus alba	30	Y	FACW
5.			
	70 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Ranunculus repens	15	Y	FAC
2. Lysichiton americanum	5		OBL
3. Oenanthe sarmentosa	5		OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	25 = Total Cover		

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 30

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					mod leg Loam	
6-10	10YR 3/1	100					Loam	20% gx.
10-18	2.5Y 5/2	97	2.5Y 5/4	3	C	M	CL	20% gx

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6

Wetland Hydrology Present? Yes X 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: Issaquah-Pine Lake Road City/County: Sammamish Sampling Date: 3-26-22
Applicant/Owner: Dedonato State: WA Sampling Point: SP-4
Investigator(s): Hamidi Section, Township, Range:
Landform (hillslope, terrace, etc.): slope Local relief (concave, convex, none): convex Slope (%): 5
Subregion (LRR): A Lat: Long: Datum:
Soil Map Unit Name: Seattle muck NWI classification: upland
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 X No ____	Is the Sampled Area within a Wetland? Yes X No ____
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
photos 502-506 near flag A-11

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	50	Y	FAC
2.			
3.			
4.			
	50 = Total Cover		

Sapling/Shrub Stratum (Plot size: 15')			
1. Rubus armeniacus	20	Y	FAC
2. Oemleria cerasiformis	10		FACU
3. Sambucus racemosa	15		FACU
4. Rubus spectabilis	20	Y	FAC
5.			
	65 = Total Cover		

Herb Stratum (Plot size: 5')			
1. Polystichum munitum	30	Y	FACU
2. ~~Oemleria Cerasiformis~~			~~FACU~~
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	= Total Cover		

Woody Vine Stratum (Plot size: 15')			
1. Rubus ursinus	10	Y	FACU
2.			
	10 = Total Cover		

% Bare Ground in Herb Stratum moss

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A =

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2-0	—							
0-7	10YR 3/2	100	—				L	
7-18	10YR 3.5/2	100	—				L	20% gr.

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

APPENDIX B

Wetland Rating Forms

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A - Issaquah-Pine Lake RD Date of site visit: 2-5-22

Rated by Paul Hamidi Trained by Ecology? X Yes ___ No Date of training 2015

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

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

Source of base aerial photo/map Google Earth, King CO, IMAP

OVERALL WETLAND CATEGORY II (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

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

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

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

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	(H) M L	(H) M L	(H) M L	
Landscape Potential	H (M) L	(H) M L	H M (L)	
Value	(H) M L	(H) M L	H M (L)	TOTAL
Score Based on Ratings	8	9	5	22

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	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	X

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	A
Hydroperiods	D 1.4, H 1.2	B
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	B
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	A
Map of the contributing basin	D 4.3, D 5.3	C
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	D
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	E
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	F

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

Wetland name or number A

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

D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
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	4
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > $^1/_{10}$ of area points = 1 Wetland has persistent, ungrazed plants < $^1/_{10}$ of area points = 0	3
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area that is ponded for at least 2 months. See description in manual.* Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	4
Total for D 1 Add the points in the boxes above	13

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

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

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

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

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

Wetland name or number A

DEPRESSIONAL AND FLATS WETLANDS

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

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

D 4.1. Characteristics of surface water outflows from the wetland:		2
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	
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.*		5
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	
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.*		5
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	
Total for D 4 — Add the points in the boxes above		12

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

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

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

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

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

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

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

Wetland name or number A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

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

If the unit has a Forested class, check if:

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

4

H 1.2. Hydroperiods

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

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

3

H 1.3. Richness of plant species

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

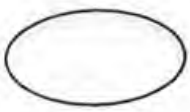
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

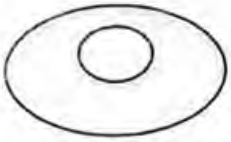
2

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

3

Wetland name or number A

H 1.5. Special habitat features:	
Check the habitat features that are present in the wetland. *The number of checks is the number of points.*	
X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).	
X Standing snags (dbh > 4 in) within the wetland	
___ Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)	
X Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)*	5
X At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)*	
X Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	
Total for H 1 — Add the points in the boxes above	17

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*).	
Calculate: % undisturbed habitat 1 + [(% moderate and low intensity land uses)/2] 0 = 1 %	
If total accessible habitat is:	
> 1/3 (33.3%) of 1 km Polygon — points = 3	0
20-33% of 1 km Polygon — points = 2	
10-19% of 1 km Polygon — points = 1	
< 10% of 1 km Polygon — points = 0	
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.	
Calculate: % undisturbed habitat 15 + [(% moderate and low intensity land uses)/2] 5 = 20 %	
Undisturbed habitat > 50% of Polygon — points = 3	1
Undisturbed habitat 10-50% and in 1-3 patches — points = 2	
Undisturbed habitat 10-50% and > 3 patches — points = 1	
Undisturbed habitat < 10% of 1 km Polygon — points = 0	
H 2.3. Land use intensity in 1 km Polygon: If	
> 50% of 1 km Polygon is high intensity land use — points = (- 2)	-2
≤ 50% of 1 km Polygon is high intensity — points = 0	
Total for H 2 — Add the points in the boxes above	-1

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

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

Rating of Value If score is: ___ **2 = H** ___ **1 = M** X **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. NONE

Figure A: Cowardin Classes & 150' Buffer

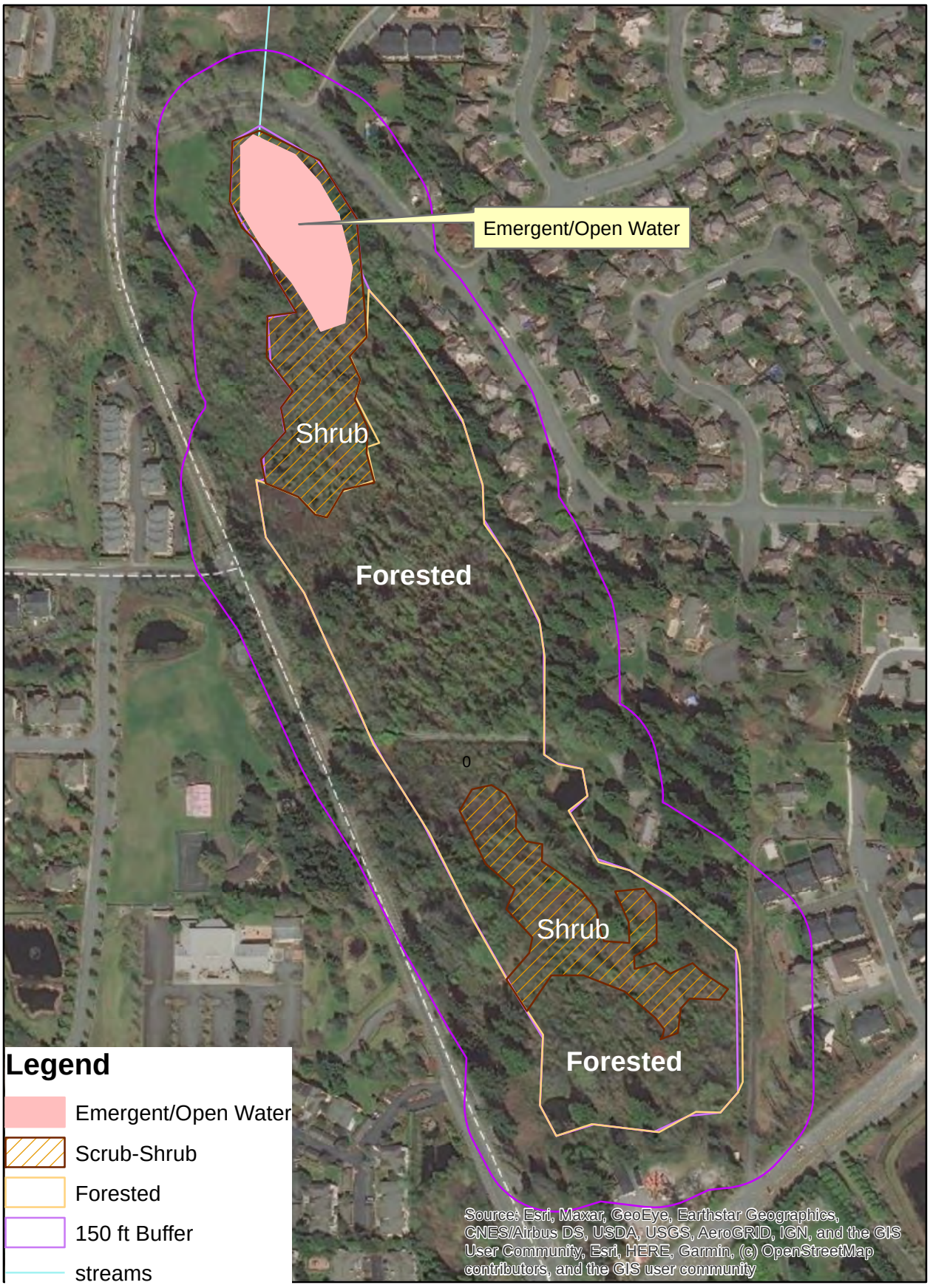


Figure B: Hydroperiods

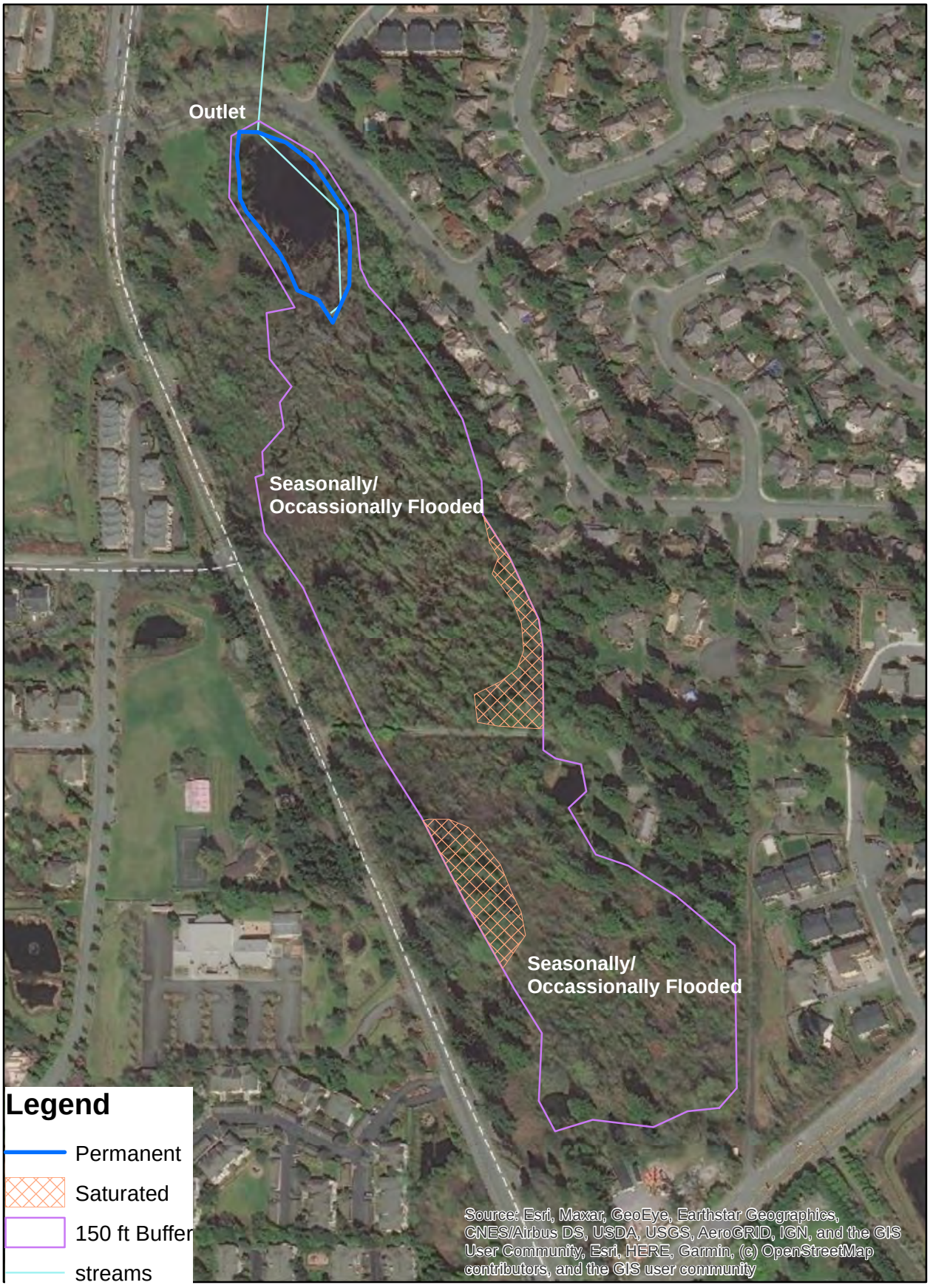


Figure C: Contributing Basin

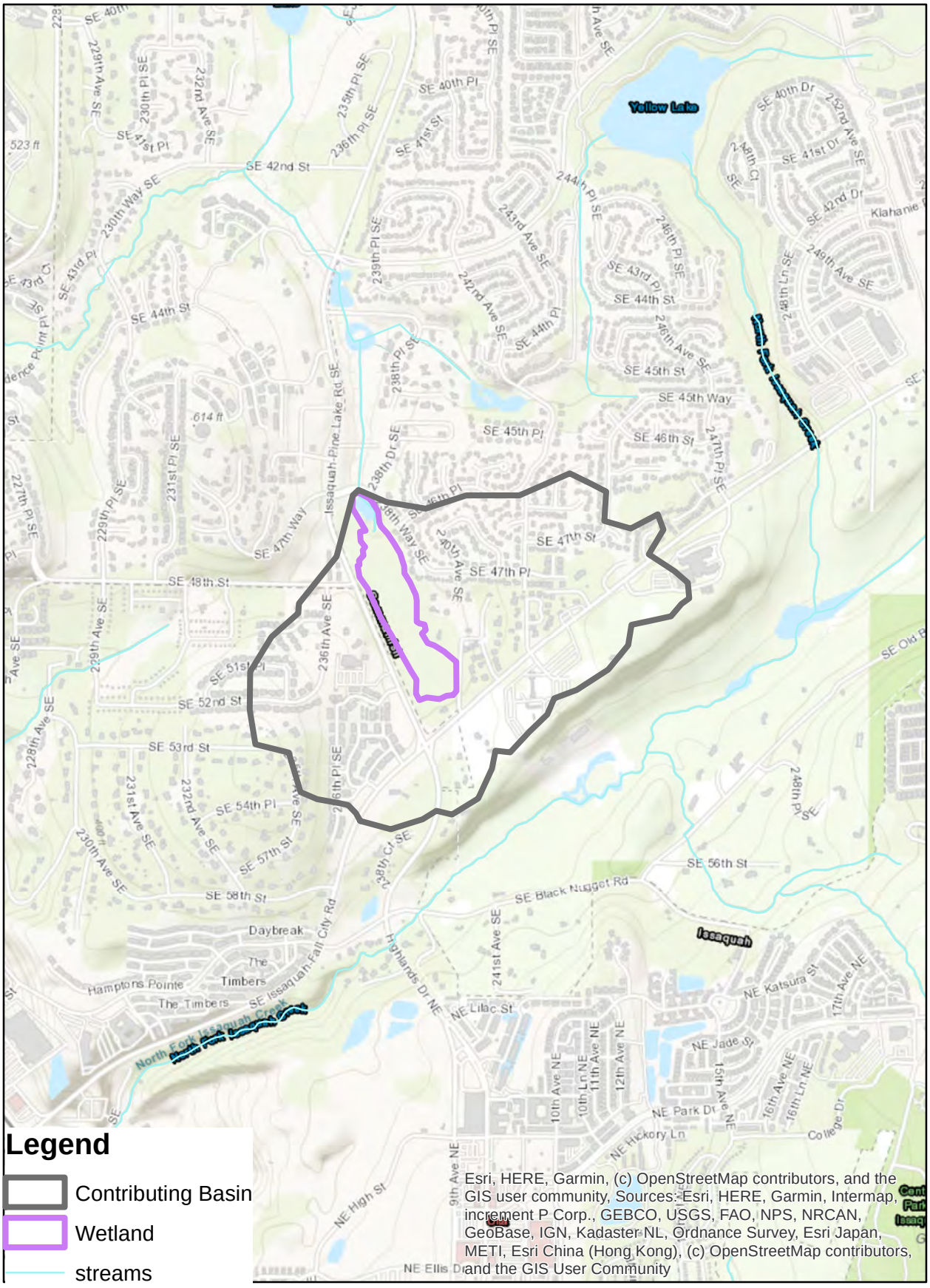
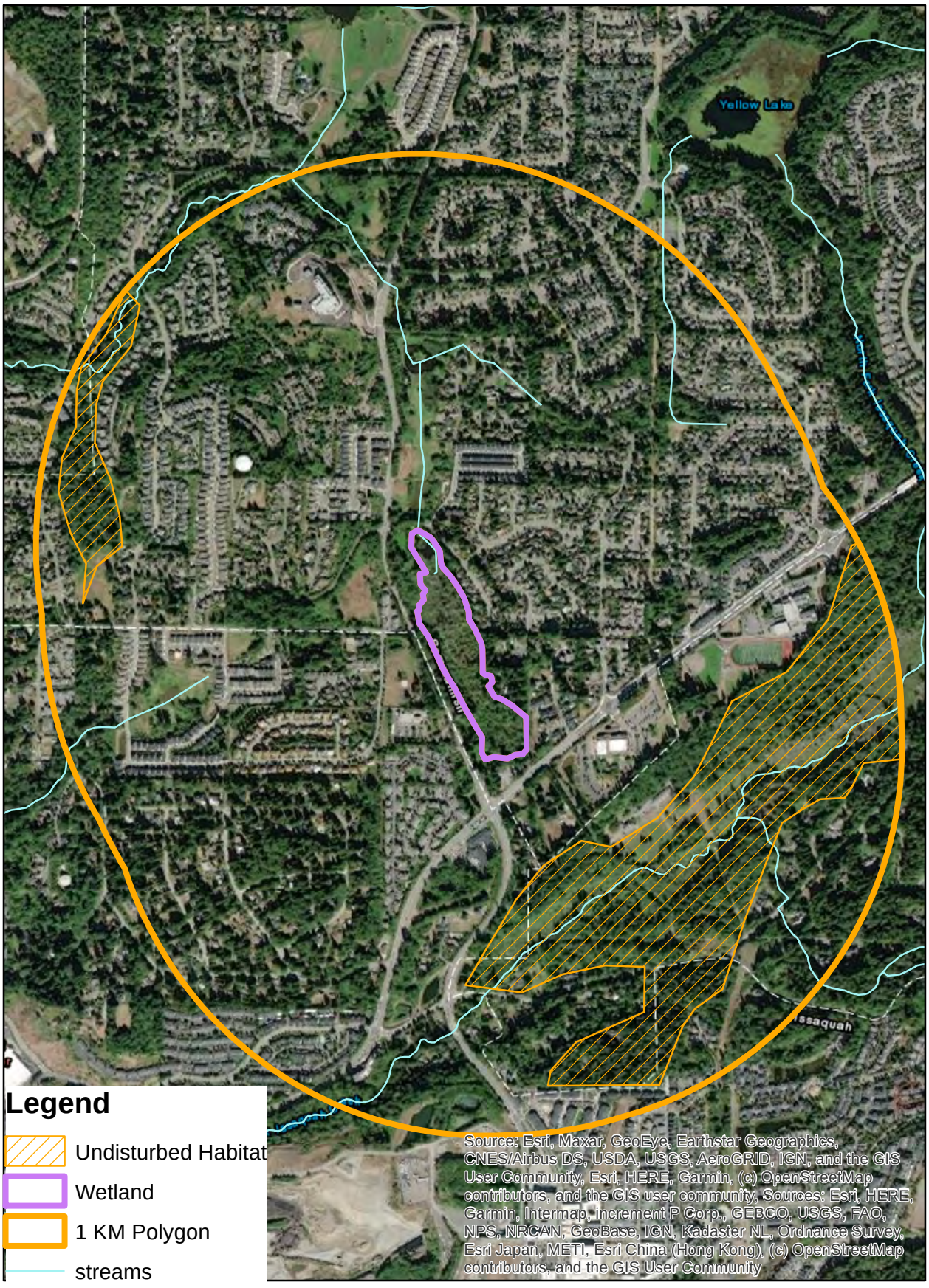
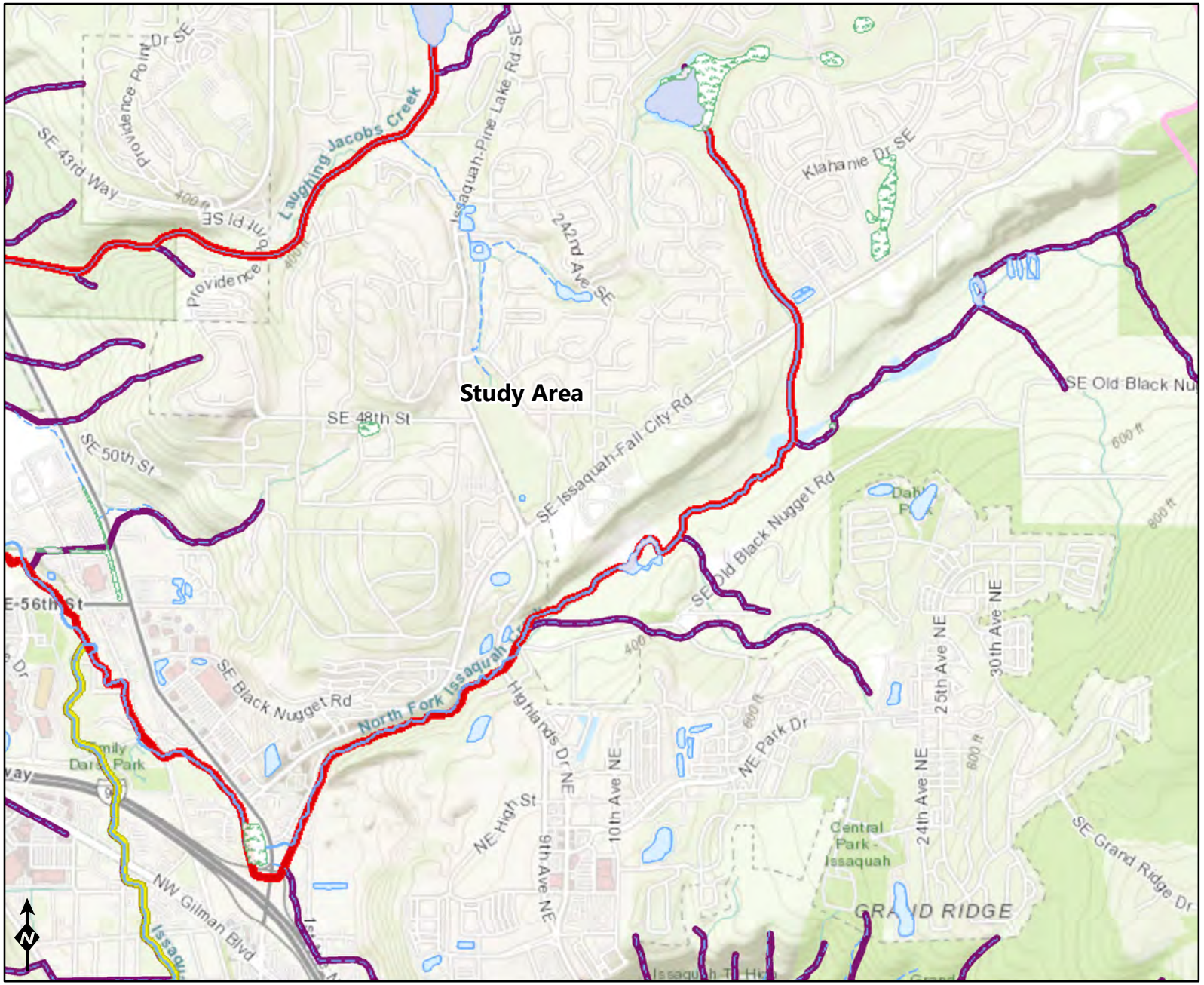


Figure D: 1 KM Polygon



April 8, 2022

Figure E: 303(d) Listed Waters



Assessed Water/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

Water Quality Standards
- All Standards

Counties
- County boundary

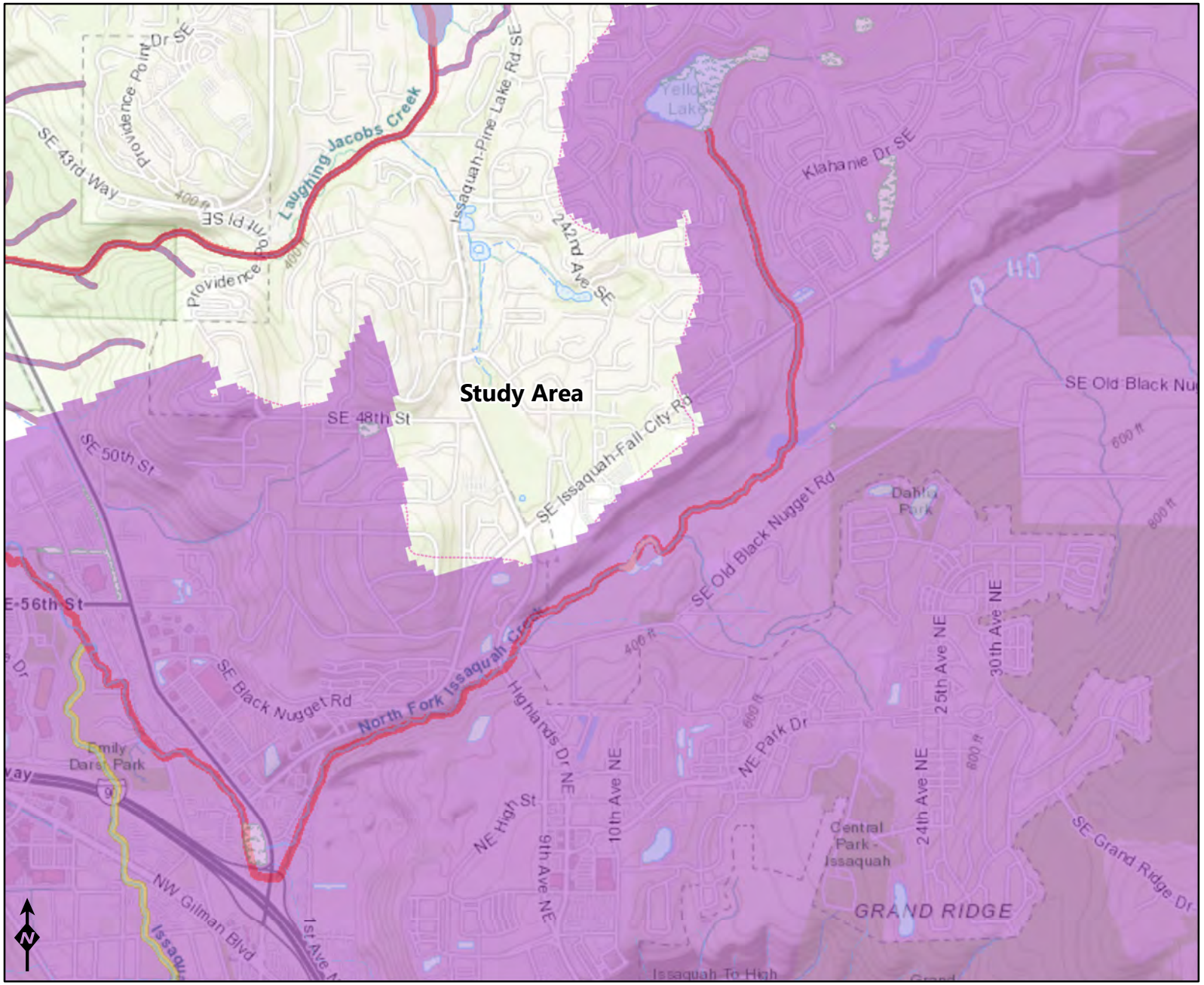
Miles
0 0.25 0.5 1

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and

DEPARTMENT OF ECOLOGY
State of Washington

April 8, 2022

Figure F: Water Quality Improvement Projects



Assessed Water/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

WQ Improvement Projects
- Approved
- In Development

Water Quality Standards
- All Standards

Counties
- County boundary

Miles
0 0.25 0.5 1

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and

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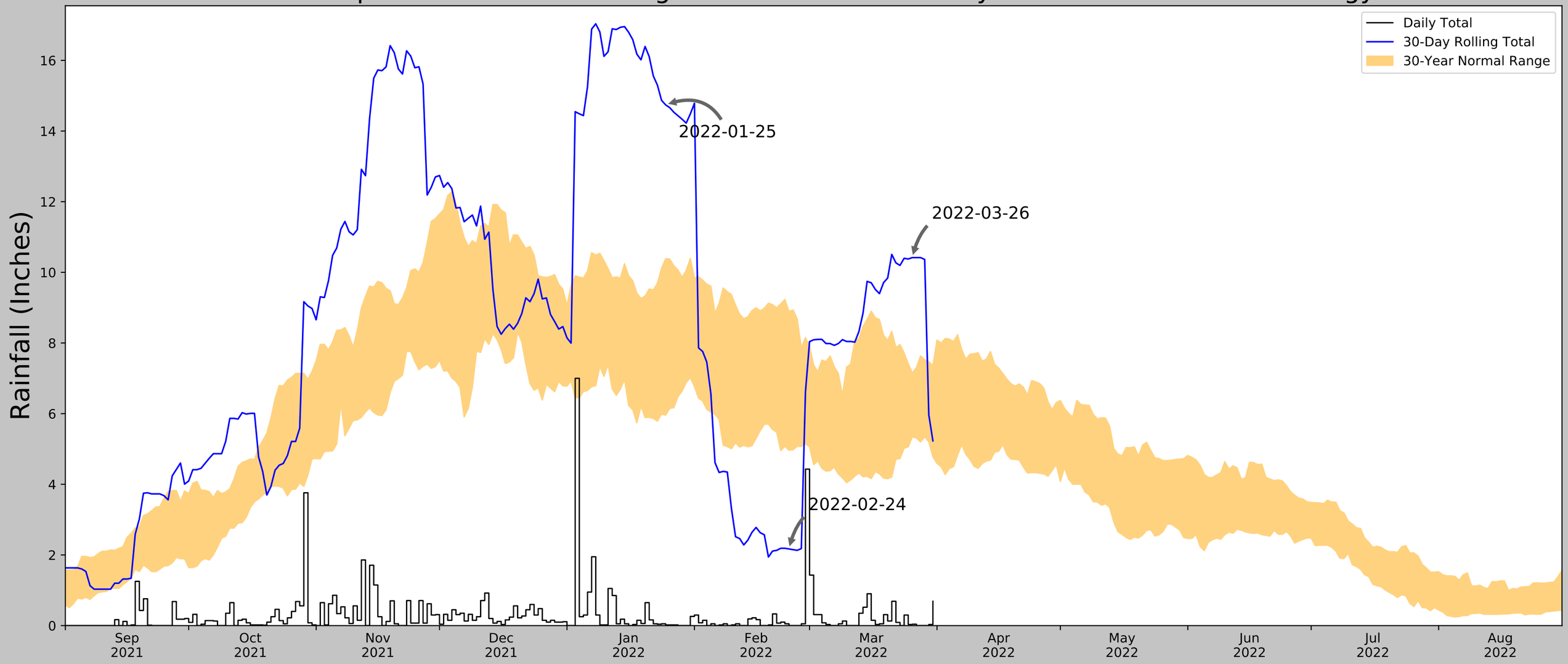
State of Washington

APPENDIX C

Antecedent Precipitation

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



Coordinates	47.560813, -122.024245
Observation Date	2022-03-26
Elevation (ft)	367.06
Drought Index (PDSI)	Mild wetness (2022-02)
WebWIMP H_2O Balance	Wet Season

30 Days Ending	30^{th} %ile (in)	70^{th} %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-03-26	5.342126	7.149213	10.417323	Wet	3	3	9
2022-02-24	4.965354	8.893307	2.169291	Dry	1	2	2
2022-01-25	5.957874	10.386615	14.740158	Wet	3	1	3
Result							Normal Conditions - 14

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
SNOQUALMIE FALLS	47.5414, -121.8361	439.961	8.876	72.901	4.641	9883	87
SNOQUALMIE 2.0 WNW	47.5334, -121.8591	744.095	1.207	304.134	0.91	220	0
SNOQUALMIE 2.9 WNW	47.5375, -121.8756	886.155	1.862	446.194	1.669	424	0
FALL CITY 0.4 SW	47.5637, -121.9014	130.906	3.413	309.055	2.591	348	0
NORTH BEND 2.8 SE	47.4689, -121.745	517.06	6.571	77.099	3.464	338	3
ISSAQUAH 2.6 NNE	47.5648, -122.0114	477.034	8.333	37.073	4.059	1	0
SAMMAMISH 1.7 NNE	47.633, -122.0308	393.045	11.063	46.916	5.497	2	0
LANDSBURG	47.3767, -121.9614	535.105	12.797	95.144	6.976	136	0
SEATTLE TACOMA INTL AP	47.4444, -122.3139	370.079	23.291	69.882	12.109	1	0

APPENDIX D: SITE PHOTOGAPHS

1) Looking southeast at Wetland A (March 26, 2022)

2) Beaver dam near Sample Plot SP-1

3) Looking north near SP-1 at ponded area at north end of Wetland A

4) Typical buffer vegetation around Wetland A

5) Looking east at central portion of Wetland A

6) Looking north at upland area near Issaquah-Pine Lake Road

7) Looking south from 238th Way SE toward pond and forested wetland (February 5, 2022)

8) Looking southeast at Wetland A in southern part of study area (February 5, 2022)