CONFLUENCE
ENVIRONMENTAL COMPANY

# 7511 92nd Avenue SE
# CRITICAL AREAS STUDY AND MITIGATION PLAN

*Prepared for:*

**Mr. Dexter Lai**
May 15, 2019

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# 7511 92nd Avenue SE
# CRITICAL AREAS STUDY AND MITIGATION PLAN

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May 15, 2019

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# 1.0 INTRODUCTION

On March 1 and March 15, 2019, Confluence Environmental Company (Confluence) conducted site visits at 7511 92nd Avenue SE (tax parcel 2579500190) (Figure 1). The purpose of the site visits was to determine the presence and extent of critical areas on and adjacent to the property. The effort focused on wetlands and streams. 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 visits.

The study parcel is located on Mercer Island, which is within Lake Washington, and is therefore subject to the City of Mercer Island (City) jurisdiction. The site is located within Water Resource Inventory Area 8 for the Cedar-Sammamish Watershed. The study parcel and surrounding parcels are currently zoned Residential (R-9.6) and developed with single-family residences.

Although the majority of the critical area delineations occurred on the study parcel, the 3 adjacent parcels to the north and northwest (tax parcel numbers 8566100140, 8566100150, and 2579500188) were also assessed where stream and wetland features overlapped the parcel boundaries. Permission to access these parcels was given per the property owners and/or the project applicant.

The development project that has triggered this critical area review will occur on parcel 2579500188 (the project parcel).


**Figure 1. Project Parcel, Study Parcel, and Vicinity Map**

# 2.0 METHODS

Confluence conducted both a wetland delineation and an ordinary high water mark (OHWM) delineation on the property. This section describes the methods used to identify the presence or absence of wetlands and delineate the OHWM.

## 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 Mercer Island GIS (City of Mercer Island 2019),
- King County iMap (King County 2019),
- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) (USFWS 1981),
- National Resources Conservation Service (NRCS) Soil Survey (NRCS 2019a),
- Washington Department of Fish and Wildlife (WDFW) SalmonScape (WDFW 2019a),
- WDFW Priority Habitat and Species (WDFW 2019b), and
- Washington Department of Natural Resources (DNR) Forest Practices Application Mapping Tool (DNR 2019).

Results of the GIS database searches are in Appendix A.

## 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 3 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 3 criteria must be present for an area to be determined a wetland. Wetland delineation data forms are in Appendix B.

The wetland boundary was determined by changes in vegetation, hydrology, and hydric soil indicators and topographic differences that indicated the shift from wetland to upland. The perimeter of the wetland was delineated with the strategic hanging of flags. The locations of the

wetland flags were recorded using a differential GPS with sub-meter accuracy and by a licensed surveyor.

The PLANTS Database (NRCS 2019b) 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 2004) 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 C.

## 2.3 Ordinary High Water Mark Delineation

The Washington State Code defines the OHWM as "on all lakes, streams, and tidal water is that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department" (RCW 90.58.030).

Washington State Department of Ecology (Ecology) has published a guide (Anderson et al. 2016) to interpret the code and provide guidance for field OHWM determinations. Confluence used this guidance to determine the OHWM of an unnamed stream in the vicinity of the property.

Confluence identified discrete locations on the right (south) and left (north) bank of the stream to delineate the OHWM. Locations were chosen based on presence of field indicators of OHWM identified in Anderson et al. (2016) and shape of the channel. The location of the OHWMs were marked with pin flags within the development area and all OHWM locations within the study area were recorded using a differential GPS with sub-meter accuracy and by a licensed surveyor.

# 3.0 RESULTS

This section describes the results of the critical areas study.

## 3.1 General Site Description

The study parcel (no. 2579500190) is approximately 24,035 square feet (SF) in size and contains a 4,130 SF single-family residence and driveway. The parcel contains landscaped vegetation, including small patches of lawn and ornamental vegetation. The northern parcel line is dominated by native big leaf maple (*Acer macrophyllum*) and invasive Himalayan blackberry (*Rubus armeniacus*). The northern and northwestern parcel boundaries are steep slopes, and the adjacent parcels along the northwestern parcel boundaries are also dominated by Himalayan blackberry. The steep slope area appears to be an old landscape scar, exposing soils that at one time were deeper than surface soils.

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, there is a watercourse located on and adjacent to the study parcel. The City of Mercer Island GIS has identified an unnamed Type 2 stream that flows across the northern portion of the study parcel (City of Mercer Island 2019). This unnamed stream converges with a second unnamed tributary at the southeastern portion of the parcel before flowing off-site (City of Mercer Island 2019). No wetland or stream critical areas are mapped on the study parcel by the County's GIS portal (King County 2019), the National Wetland Inventory (USFWS 2019), or the Forest Practices Application Mapping Tool for water types (DNR 2019). No salmonids or other priority species are listed as occurring in or near the unnamed stream (WDFW 2019a, b).

The majority of soils mapped on the site include Kitsap silt loam with a very small portion of Alderwood gravelly sandy loam (NRCS 2019a). Kitsap silt loam is a moderately well-drained soil with 15% to 30% slopes at the study parcel. Alderwood gravelly sandy loam occurs only at the northwest corner of the study parcel. This soil is also moderately well drained.

Photographs of the site are in Appendix D.

## 3.2 Test Plots

During the site visit, 3 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 the wetland determination data sheets recorded in the field.

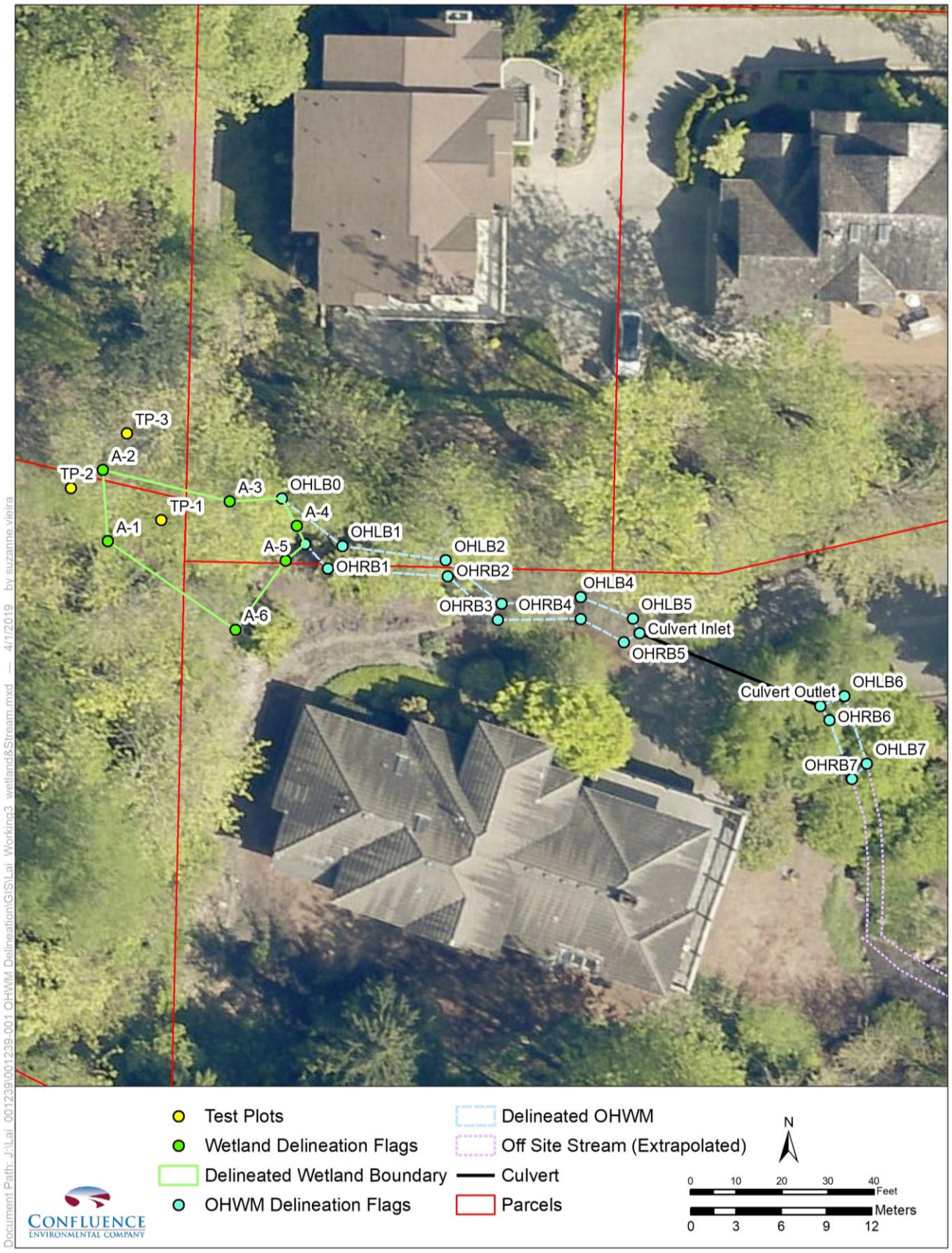


**Figure 2. Location of Test Plots and Critical Area Boundaries**

Test Plot 1 (TP-1) was located at the northeastern corner of parcel no. 8566100140 at the base of the steep slope in an area dominated by invasive Himalayan blackberry. 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 brown (7.5YR 4/2) silty clay loam with no redox features. The second layer (3-12 inches) contained grayish brown (10YR 5/2) silty clay loam with 40% yellowish brown (10YR 5/6) redox concentrations in the matrix. The soils therefore met the hydric soil indicator for depleted matrix (F3) and the hydric soil criterion was met. The primary wetland hydrology indicators of saturation (A3) and oxidized rhizospheres along living roots (C3) were observed; therefore, the wetland hydrology criterion was met. Since TP-1 met all 3 criteria, the area represented by TP-1 is a wetland identified as Wetland A.

TP-2 was located along the northeastern property line of parcel no. 8566100140, slightly to the west of TP-1. TP-2 occurs on the steep slope in the center of the Himalayan blackberry thicket. Vegetation within TP-2 passed the Dominance Test and therefore meets the wetland vegetation criterion. However, it is important to note that there was only 1 species present, Himalayan blackberry, which is an invasive species that thrives in disturbed wetland and upland areas. Soil in the top layer (0-10 inches) was a grayish brown (10YR 5/2) silty clay loam with 15% yellowish brown (10YR 5/6) redox concentrations in the matrix. The soils therefore met the hydric soil indicator for depleted matrix (F3) and the hydric soil criterion was met. No primary or secondary wetland hydrology indicators were observed; thus, the wetland hydrology criterion was not met. The presence of hydric soils without hydrology indicators on the landslide scar indicates that the hydric soil indicators are relic. Since TP-2 did not meet the wetland hydrology criteria and because the vegetation was marginal, this test plot is considered upland and represents a transition zone on the up-slope side of the wetland.

TP-3 was located at the southeastern portion of parcel no. 8566100150 within a Himalayan blackberry thicket on the side of a steep slope. This test plot occurs to the north of TP-1 and TP-2. Vegetation within TP-3 did not pass the Dominance Test or the Prevalence Index due to the presence of big leaf maple, and therefore TP-3 did not meet wetland vegetation criterion. Soil in the top layer (0-12 inches) was a dark grayish brown (10YR 4/2) loam with gravel and without redox concentrations. The soils did not meet any hydric soil indicator, and therefore the hydric soil criterion was not met. No primary or secondary wetland hydrology indicators were observed, and so the wetland hydrology criterion was not met. Since TP-3 did not meet any of the wetland criteria, the area represented by TP-3 is not a wetland. TP-3 represents the transitional zone to the north of the wetland.

## 3.3 Wetlands

TP-1 represented the area that met all 3 wetland criteria on the property. The on-site wetland is described in detail below, summarized in Table 1, and shown in Figure 2. There were no other wetlands identified in GIS databases within 300 feet of the study parcel.

**Table 1. Wetland Summary**

| Wetland Name | Cowardin Classification[1] | Size | Wetland Rating | | | | |
|---|---|---|---|---|---|---|---|
| | | | Hydrologic | Water Quality | Habitat | Total | Category |
| **Wetland A** | PSS3D | 856 SF | 6 | 4 | 3 | 13 | IV |

[1] FGDC 2013

### *3.3.1 Wetland A*

Wetland A is located on the steep slope area at the property corners of 8566100140, 8566100150, 2579500188, and 2579500190 (see Figure 2). TP-1, described above, represents Wetland A. According to the Cowardin classification system (FGDC 2013), Wetland A is a palustrine scrub-shrub wetland. Wetland A is dominated by Himalayan blackberry. As Wetland A is a slope wetland, it occurs within a distinct topographic steep slope area. The upper, western portion of the wetland begins approximately 15 feet east of the shoulder of the slope, and the northern and southern boundaries of the wetland are contained by 2 terraces that rise up on either side of the wetland. The toe of the wetland occurs at another topographic break where the ground levels out, and the unnamed stream channel begins (see Figure 2). Although there was no standing water on the slope wetland, the distinct topography, soil saturation, and vegetative shifts to non-hydrophytic vegetations (e.g., sword fern [*Polystichum munitum*] and big leaf maple) were used to determine the wetland boundary. According to the 2004 Wetland Rating System (Hruby 2004), Wetland A was rated as a Category IV wetland, with a hydrology score of 6, water quality score of 4, and habitat score of 3.

### *3.3.2 Off-Site Wetlands*

Although Wetland A extends partially off-site, the entire wetland was delineated per the permissions granted by the project applicant and landowners. No other known wetlands are mapped within 300 feet of the study site or Wetland A.

## 3.4 Watercourses

An unnamed stream (i.e., watercourse) was identified on the study parcel and the parcel immediately to the north of the study parcel (parcels no. 2579500188 and 2579500190). Although several of the online sources listed in Section 2.1 did not have this unnamed stream mapped, it was identified on the City of Mercer Island GIS Portal (City of Mercer Island 2019). The unnamed stream runs from west to east along the northern boundary of the study parcel, is conveyed through a culvert under the driveway of the study parcel, and turns sharply south (see Figure 2). While only this portion of the unnamed stream was delineated, the stream may then continue to flow south or southeast into a ditch to the east of the study site, before being conveyed into Lake Washington. There are no salmonids or priority fish, wildlife, or habitats listed within or adjacent to the study site (WDFW 2019a, b). The unnamed stream appears to

originate at the toe of the slope of Wetland A, and most likely conveys a spring or seep that also produces the wetland. During the site visit the OHWM was delineated.

Within the study site and adjacent parcel, the channel of the unnamed stream is mostly exposed cobbles and gravels. The stream banks were largely not armored, although some boulders were placed along the culvert inlet and outlet under the driveway to provide structural protection. Black landscaping fabric was also evident on both banks. This fabric may play a part in controlling streambed erosion. The primary indicators used to delineate the OHWM included the top of bank and darker stains on fixed objects such as boulders and landscaping fabric. As the vegetation was largely landscaped along the stream channel, plant species were not used as indicators of OHWM.

This stream is defined as a Type 2 stream according to the City of Mercer Island GIS Portal (City of Mercer Island 2019). A Type 2 stream is described as a watercourse with year-round flow and not used by fish, according to MICC 19.07.070A.2. However, anecdotal evidence provided by the property owner and the Project surveyors indicated that the stream does dry up and ceases to flow in the summer months. Additionally, during the surveyors' site visit to record the location of wetland and OHWM flagging, the surveyors observed a dry streambed. Given the size and level of flow during the March 2019 site visits, this is not a Type 2, perennial stream. As described by the City of Mercer Island in MICC Section 19.07.070A.3., a Type 3 watercourse has intermittent or seasonal flow and is not used by fish. Thus, the unnamed stream meets the MICC definition of a Type 3 stream.

## 4.0 REGULATORY IMPLICATIONS

According to the Mercer Island City Code (MICC), the following standard buffers apply:

- Wetland A is a Category IV wetland; thus, the standard buffer of 35 feet applies to this wetland. However, with buffer enhancement a minimum buffer width of 25 feet can be used.
- The unnamed stream, a Type 3 stream, has a standard buffer of 35 feet. However, with buffer enhancement a minimum buffer width of 25 feet can be used.

Figure 3 shows Wetland A, the unnamed stream, and their buffers including the standard 35-foot buffer (shown in blue) and the reduced 25-foot buffer (shown in green) as they encroach into the project parcel. Development within these buffers or within the critical areas themselves requires compliance with MICC Chapter 19.07, specifically Sections 19.07.070.B.2 and 19.07.080C.2.

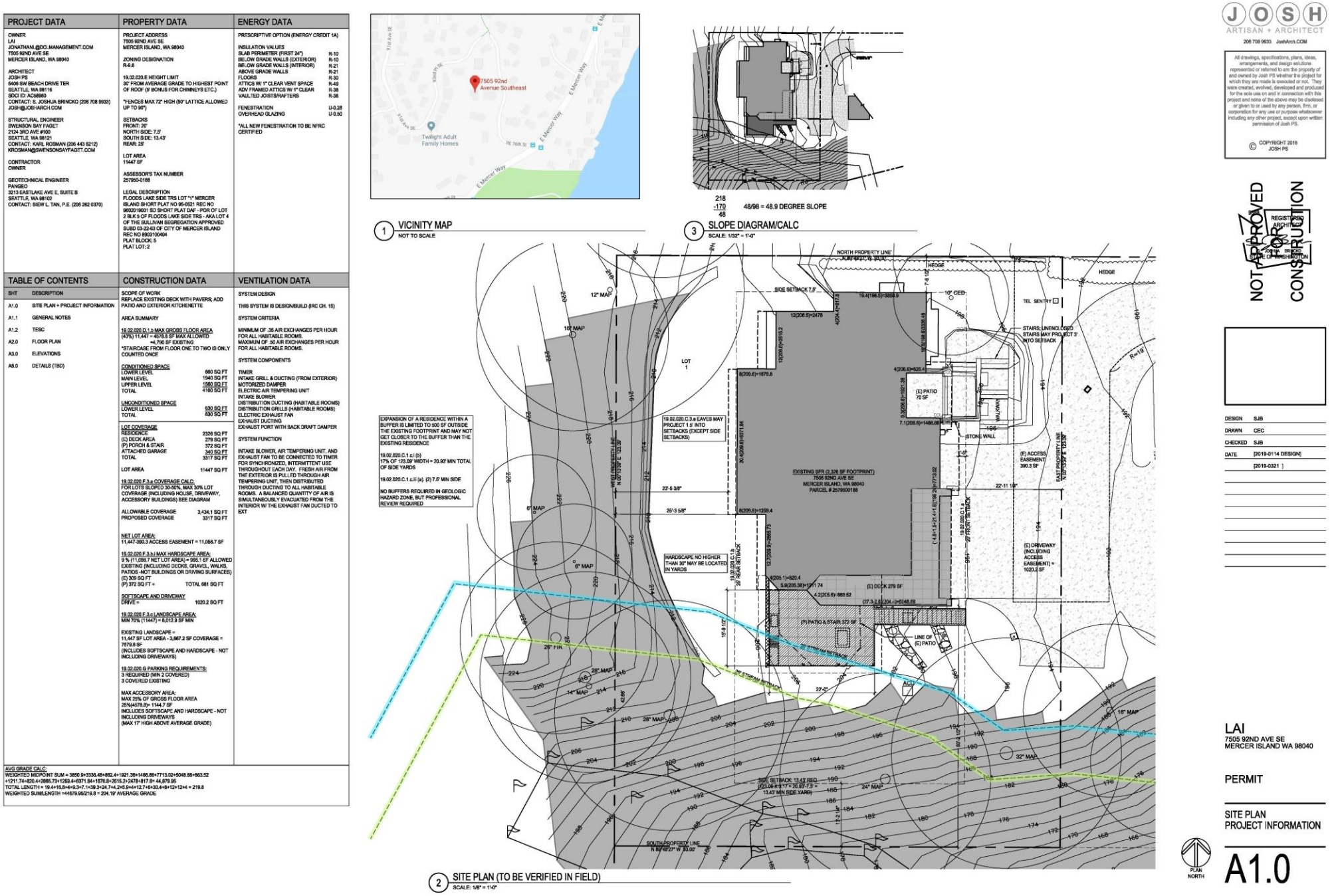


**Figure 3. Critical Area Boundaries and Standard Buffers**

## 5.0 PROPOSED DEVELOPMENT

The proposed project includes the construction of a patio and staircase on the southern face of the existing single-family house and deck, including 372 SF of new construction. Figure 3 shows the existing structures and proposed construction in relation to the wetland and stream critical areas. Figure 3 also shows the standard 35-foot buffer and reduced 25-foot buffer. Due to the location of the on-site critical areas, the proposed development would encroach into the standard 35-foot buffer.

## 6.0 IMPACTS TO CRITICAL AREAS

The proposed development would not directly impact either Wetland A or the unnamed stream. However, the footprint of the proposed patio does expand into the standard 35-foot buffer, and therefore permanent impacts to the standard buffer would occur as a result of the project.

According to MICC 19.07.030.A.13, the buffers of Category IV wetlands of low value under 2,500 SF may be altered and the applicant is not required to comply with the other regulations of the MICC Environment chapter, subject to an applicant meeting the specific conditions to the satisfaction of the code official. However, there are no specific set of conditions under 19.07.030.A.13 like there are under all the other specified allowed alterations. Nor does 19.07.030.A.13 refer to other sections of the code that need to be complied with, like other allowed alterations have. While there are no specific conditions or code sections to be met, the proposed mitigation would meet the minimum buffer width of 25 feet for Category IV wetlands described in MICC 19.07.080.

To avoid impacts to the wetland buffer to the maximum extent, the project proposes a critical areas buffer reduction with enhancement mitigation strategy. The standard buffer width will be reduced from 35 feet to a minimum width of 29 feet, which is greater than the minimum allowable buffer distance 25 feet required by MICC 19.07.070B.1 and 19.07.080C.1 (Figure 3). Reducing the buffer to allow for the proposed patio footprint would result in a loss of approximately 60 SF of buffer. Currently there is approximately 225 SF of impervious surface (a concrete pad and rockery wall) within the patio and stairway footprint, approximately 20 SF of which occurs within the buffer reduction area. The remaining portion of the buffer within the proposed buffer reduction area is bare earth or ornamental lawn. Using buffer reduction with enhancement, as allowed under MICC 19.07.070B.2 and 19.07.080C.2, results in no permanent impacts to the wetland buffer from the proposed development. Details on the proposed mitigation are in Section 7.0.

# 7.0 PROPOSED MITIGATION PLAN

As stated above, the proposed development would reduce the buffer to 29 feet at the greatest extent of reduction. The reduced portion of the critical areas buffer does not contain a steep slope, as required by MICC 19.07.0703(e). The total area to be reduced would include a triangular area of approximately 60 SF. Mitigation for the 60 SF reduction area would occur at a ratio of 1:1 through buffer enhancement of 60 SF of buffer within the 25-foot minimum buffer area and outside of the steep slope (see Figure 4).

The scientific literature recognizes that buffers provide important functions that protect wetlands (Sheldon et al 2005). These functions are generally categorized as hydrology, water quality, and habitat functions. However, impervious surfaces in buffers provide no functions, and lawn provides very little habitat function and little to no hydrology or water quality functions. Therefore, reducing the buffer from 35 feet to 29 feet would not decrease existing habitat functions of the buffer, since habitat functions do not exist or are of very low quality within the reduced buffer area.

As stated above, according to MICC 19.07.070 and 19.07.080, reducing the buffer from 35 feet to a minimum of 25 feet is allowed as long as the buffer reduction includes buffer enhancement and does not result in a net loss of functions. The proposed development reduces only the northern portion of the critical areas buffer, which is largely impervious and provides little to no function.

This mitigation proposes to enhance 60 SF of the buffer upslope of the critical areas (Wetland A and the unnamed stream) within the 25-foot reduced buffer area (Figure 4). By enhancing the buffer in the proposed location, buffer functions are expected to increase. The plantings will not only increase habitat functions, but they will also increase water quality and hydrology functions and reduce the potential for erosion from the shoulder of the slope. Enhancement actions will include removing invasive species and planting native species. Table 2 summarizes the mitigation planting scheme.

**Table 2. Planting Scheme**

| Common Name | Scientific Name | Container Size | Spacing | Quantity |
|---|---|---|---|---|
| **Douglas Fir** | *Pseudotsuga menziesii* | 5 gallon | 3ft OC | 2 |
| **Western Red Cedar** | *Thuja plicata* | 5 gallon | 3ft OC | 1 |
| **Salmonberry** | *Rubus spectabilis* | 1 gallon | 3ft OC | 3 |
| **Black Twinberry** | *Lonicera involucrata* | 1 gallon | 3ft OC | 2 |

OC – On Center

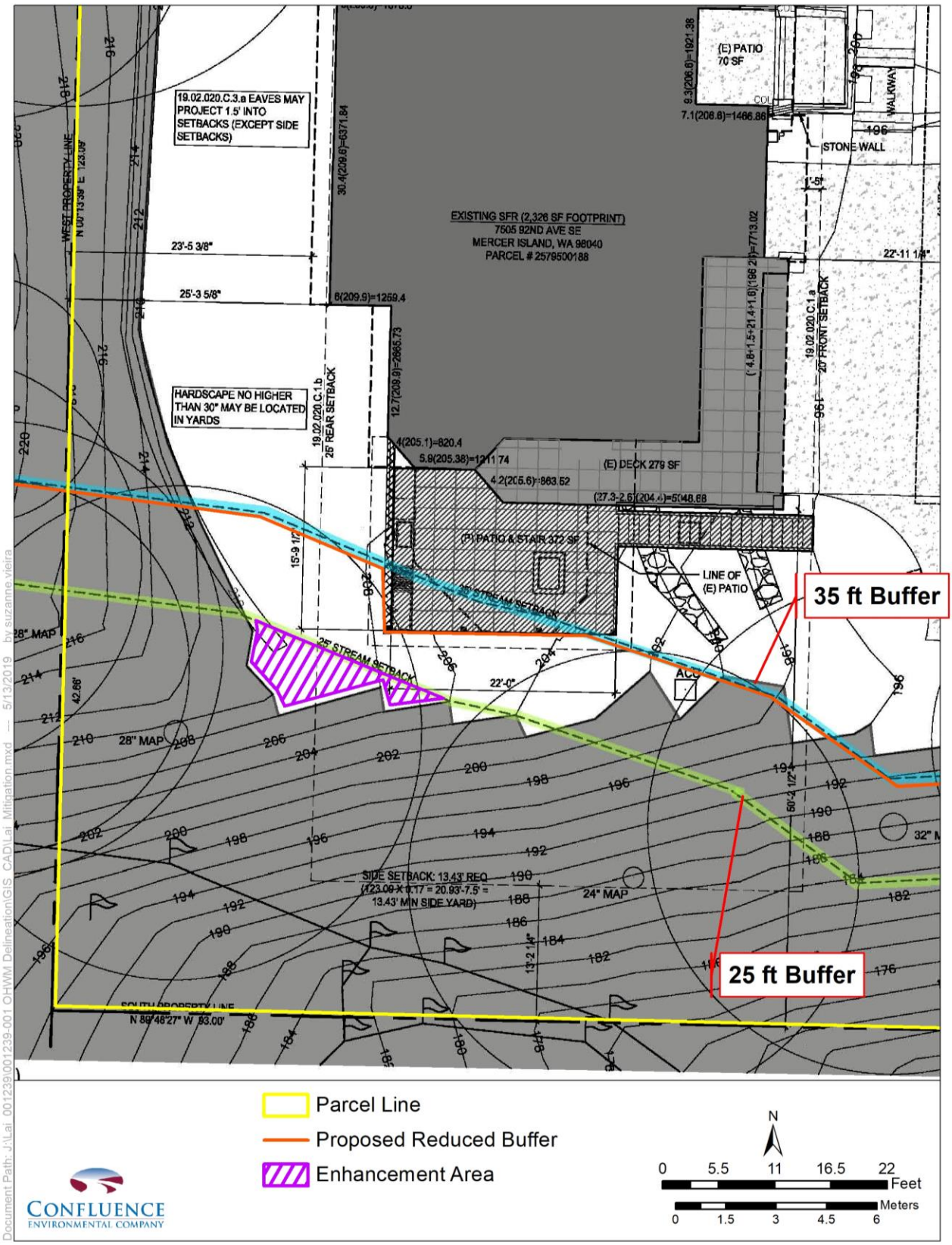


**Figure 4. Enhancement Area Map**

The on-site tree canopy is almost entirely composed of deciduous species, and therefore the addition of Douglas fir and western red cedar will provide enhanced habitat options for wildlife. Salmonberry and black twinberry both provide soil bioengineering benefits by binding soils in their roots and therefore decreasing the likelihood of erosion from the top of the slope (WSDOT 1997). These species also provide a food source for wildlife, including birds and mammals.

# 8.0 MITIGATION GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

## 8.1 Goals and Objectives

The goal of this mitigation plan is to enhance 60 SF of critical areas buffer for a Category IV wetland and Type 3 watercourse. The objective is that the mitigation area will be dominated with healthy, native plants.

## 8.2 Performance Standards

The following performance stands are to be monitored to document that the goals and objectives of the mitigation plan are being met. Table 3 summarizes the performance standards.

**Table 3. Performance Standards**

| Performance Standard | Success Criteria | | | | |
|---|---|---|---|---|---|
| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
| **Percent Survival** | 100% | 100% | 100% | 100% | 100% |

Due to an existing canopy of native deciduous trees, percent cover of native species is not included as a performance standard for this mitigation.

### *8.2.1 Performance Standard – Percent Survival*

Planted vegetation and natural recruits will be monitored for survival for 5 years (Years 1, 2, 3, 4 and Year 5). Monitoring will occur during the growing season after deciduous plants have flowered or leafed-out for easier identification. Table 3 shows the success criteria for plant survival for each year of monitoring.

High mortality could result from improper installation, diseased or infested plants, inadequate watering, or extreme weather. If more than 25% of new plantings die in a single year, the cause of the high losses will be investigated and corrected before dead plants are replaced. Dead plant material will only be removed after that year's scheduled monitoring. If less than 80% of the total plants installed have survived during the Year 5 monitoring, additional plants will be

installed to bring the planting schedule back into original specifications and yearly monitoring will continue for two additional years.

## 9.0 MONITORING PLAN

A monitoring period of 5 years is proposed to ensure that plantings survive and establish successfully. Data collected in Year 0 will provide the baseline for the success criteria for Years 1, 2, 3, 4, and 5 monitoring. Should the ecologist determine that any portion of the mitigation area needs to be replanted, a survey will be conducted after the replanting has been completed. This survey will then become the baseline for other monitoring surveys. For example, if survival success criterion is not met in Year 2 and the ecologist determines that additional trees or shrubs need to be planted, a survey will be conducted after the addition of new plants. This survey will then provide the baseline for remaining monitoring events.

### 9.1 Plant Survival

Because of the small size of the mitigation area, all installed plants will be counted during each monitoring period. The number of living plants will be divided by the number of plants installed to determine the percent survival.

### 9.2 Photo Documentation

Photos of the mitigation area will be taken during each monitoring event to provide visual documentation of the mitigation area. Permanent photo points will be established at the north-western and eastern mitigation site boundaries to document the site over time. At each of the photo points, a fixed-lens digital camera will be used to take photographs looking at the interior of the enhancement site.

### 9.3 Frequency

Monitoring will occur during the growing season after deciduous plants have flowered or leafed-out. The Year 0 monitoring event will occur within 30 days after trees and shrubs have been installed. Each of the monitoring events will occur within 30 days of the calendar date of the Year 0 monitoring.

### 9.4 Reporting

For each monitoring event, the ecologist will prepare a report. One copy of each report will be provided to the City of Mercer Island Community Planning and Development Department. The following will be included in each report:

- data tables;
- species lists;
- date of survey;
- a narrative description of methods and contingency measures taken;

- identified planted and naturally recruited trees and shrubs;
- interpretation of results; and
- color photos.

#### *9.4.1 Year 0 Report (As Built)*

The Year 0 report will be submitted within 30 days after construction is completed. In addition to the general reporting requirements stated above, the following will be included in the Year 0 report:

- actual planting density (container size, average offset);
- description of any changes from the original design; and
- planting schedule.

#### *9.4.2 Yearly Reports*

The first yearly report is due within 1 year after the City's acceptance of the as-built report. All yearly reports will be submitted within 30 days of conducting the monitoring survey.

## 10.0 MAINTENANCE PLAN

Maintenance activities in the mitigation area will change throughout the duration of the monitoring and maintenance period. These activities will be concentrated immediately after installation and continue through the first and second year's post-installation as the vegetation survives and grows. If permits are received in time, installation will occur by fall of 2019.

## 10.1 Watering

Watering may be necessary depending on the date of planting and the amount of rainfall that year. If installation occurs before May 1, the plants will receive at least 1.5 inches of water (or equivalent of rainfall) twice per month during the spring of the first season and once per week during the summer months. Watering will be more crucial if installation occurs after May 1, because the plants will not have a chance to establish themselves during the rainy season. Biweekly watering (or rainfall equivalent) will be provided if plantings occur after May 1. Monitoring of rainfall and/or soil moisture will be used to determine the need for watering during the summer and early fall period. Watering will be less critical if planting occurs in the fall. Watering may be necessary during the summers of 2020, 2021, and 2022 to assist survival and establishment of plantings. Watering will be accomplished using a temporary irrigation system or the homeowner's garden hose.

## 10.2 Weeding

Weeding around installed vegetation will be important during the summer of the first year to ensure establishment and prevent stress to the plants from competition for resources. In the first

growing season following installation, weeding will occur once monthly through August. All invasive species will be removed.

Weeding will also occur during the early and intermediate growing season of the second year after planting. The frequency can be gauged by necessity but should occur at least twice during the spring (ideally May and June), and then once more during the summer months (August or September). This weeding will also occur in the final year during establishment of the mitigation site. In other words, if planting occurs in the spring of 2020, the intensive weeding will occur during the summer of 2020 and the reduced intensity maintenance will occur in 2021 and 2022.

No weed whacking will be allowed around plantings. Weeding will be done using simple hand tools (e.g., rakes and hoes). No herbicide will be allowed. Removal of the highly invasive species such as Himalayan blackberry, English ivy (*Hedera helix*), and reed canarygrass (*Phalaris arundinacea*) is especially important in the Northwest, and emphasis should be given to their removal to prevent invasion into the planted areas. Other native but weedy species such as horsetail (*Equisetum spp.*) may need to be weeded around installed plants to ensure installed plants are not choked out by the native, weedy species.

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# Appendix A
## GIS Database Search Results

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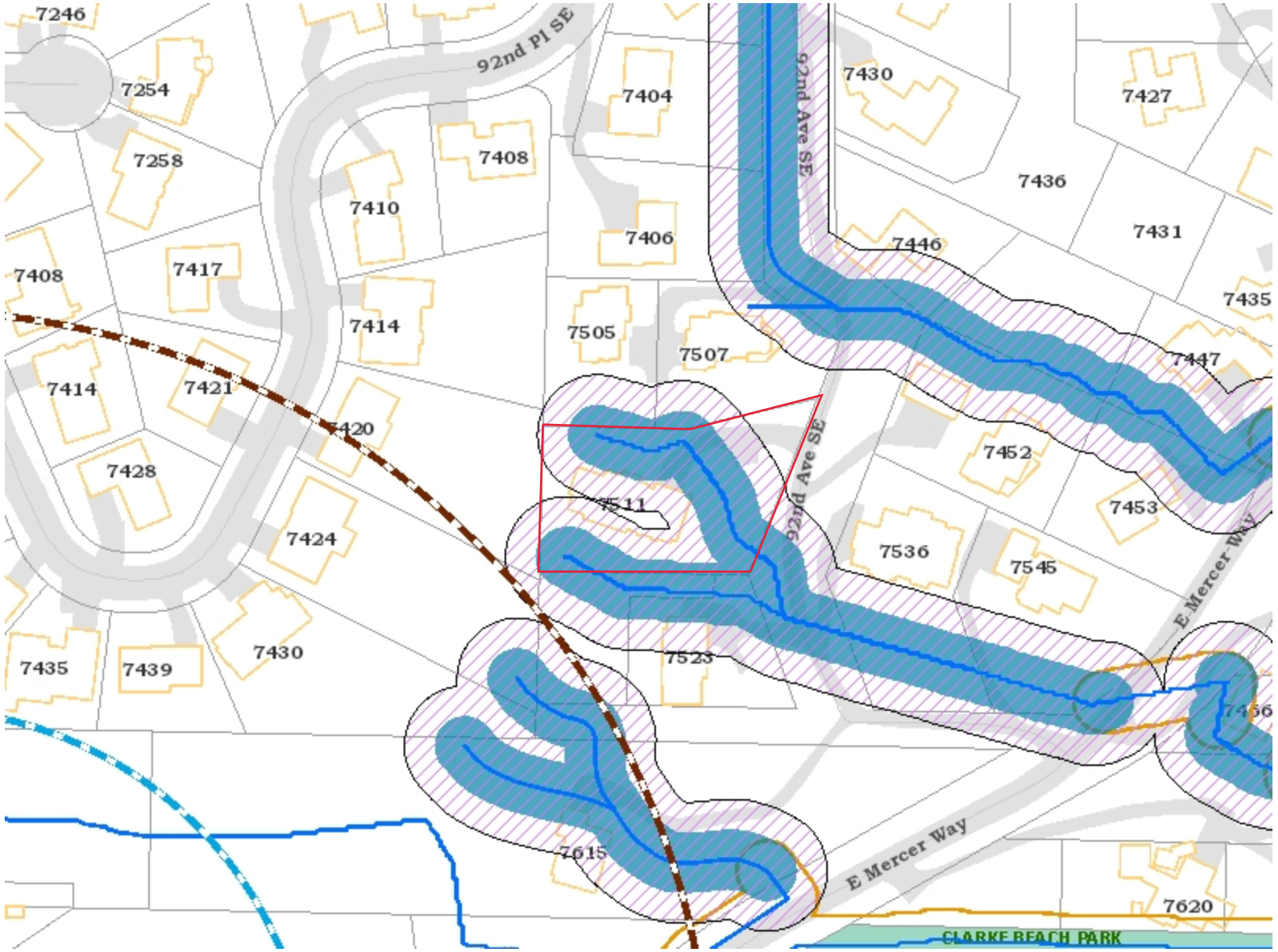
# 92nd Avenue Southeast




## Legend

- King County Highway
- Water
- Eagle Nest
- Eagle Nest Buffers
  - 330 Ft
  - 660 Ft
- Watercourse
  - 1-Potential Fish Use
  - 2-Perennial
  - 3-Seasonal
- Type 1 Standard 75 ft Buffer
- Type 2 Standard 50 ft Buffer
- Type 3 Standard 35 ft Buffer
- Type 1 Minimum 37 ft Buffer
- Type 2 Minimum 25 ft Buffer
- Type 3 Minimum 25 ft Buffer
- Piped WaterCourses 25 ft Buff
- Address
- Building
- Parcel
- Docks
- Parks
- Street
- Paved Road
- Paved Driveway
- Paved Parking Area

0 126 251 Feet

1 inch = 251.129192666667 feet



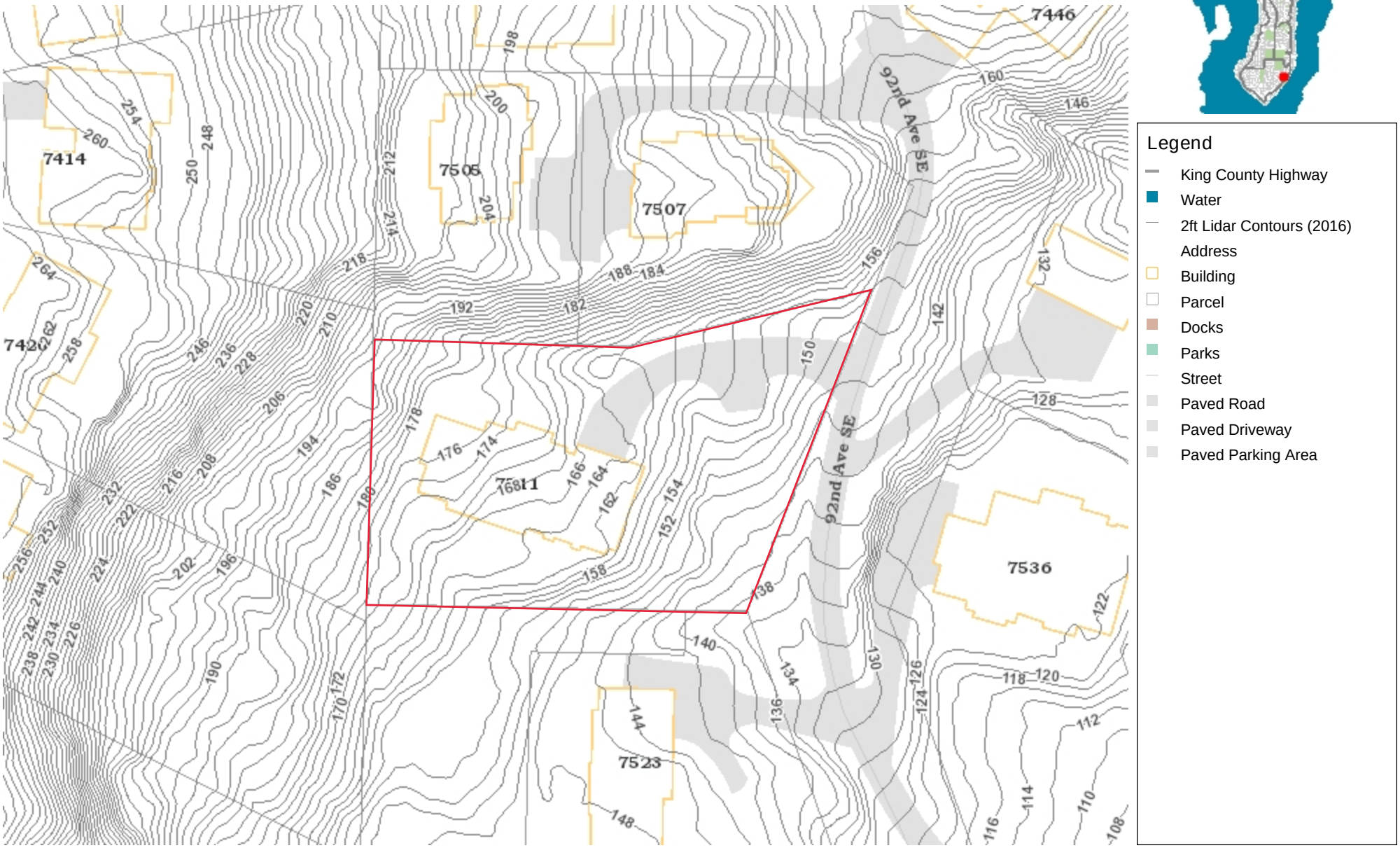
Map Printed: March 4, 2019



**Notes**

# 92nd Avenue Southeast Topo

Information & Geographic Services






## Legend

- King County Highway
- Water
- 2ft Lidar Contours (2016)
- Address
- Building
- Parcel
- Docks
- Parks
- Street
- Paved Road
- Paved Driveway
- Paved Parking Area

0 61 122 Feet

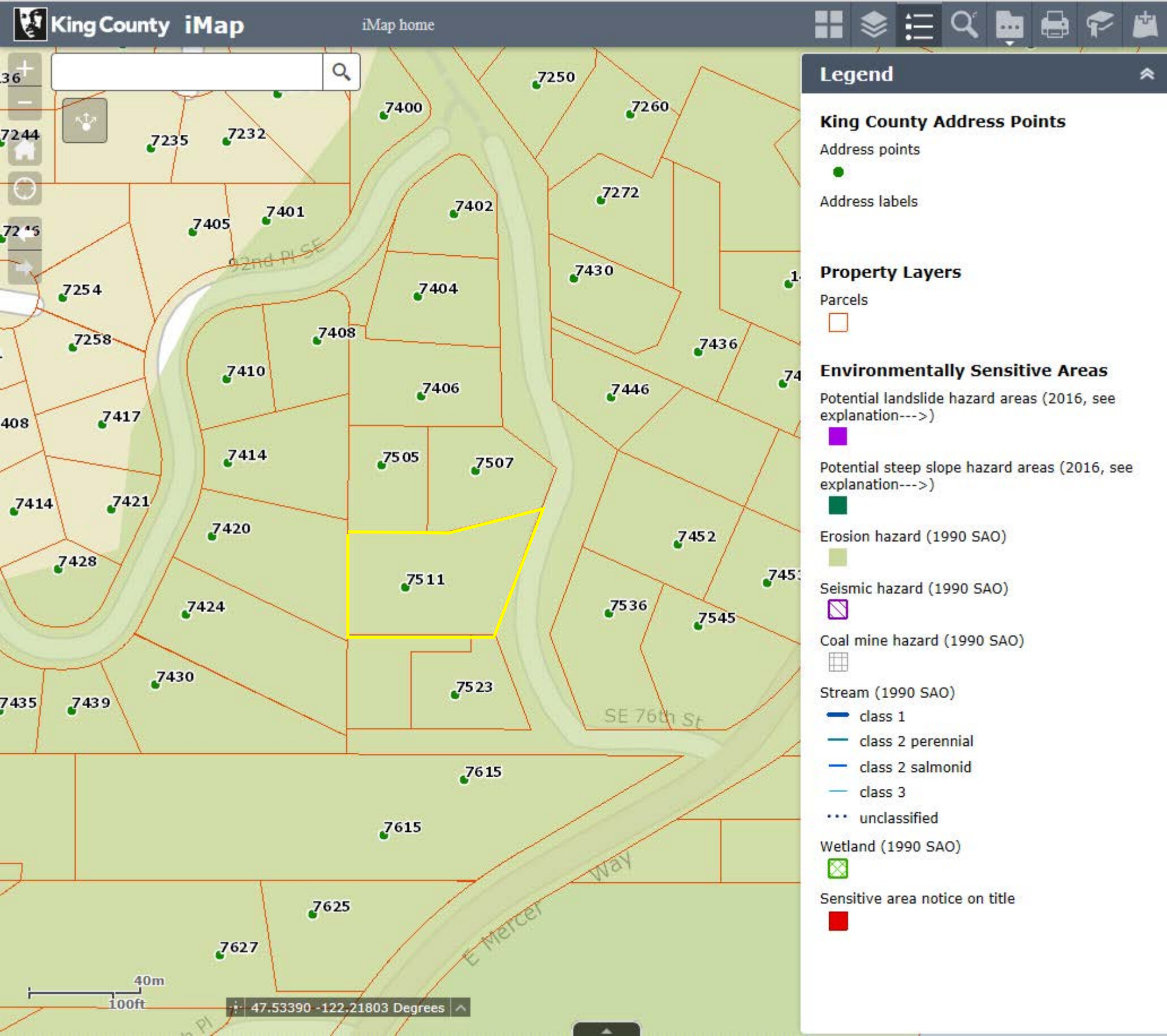
1 inch = 122.2784705 feet



Map Printed: March 4, 2019

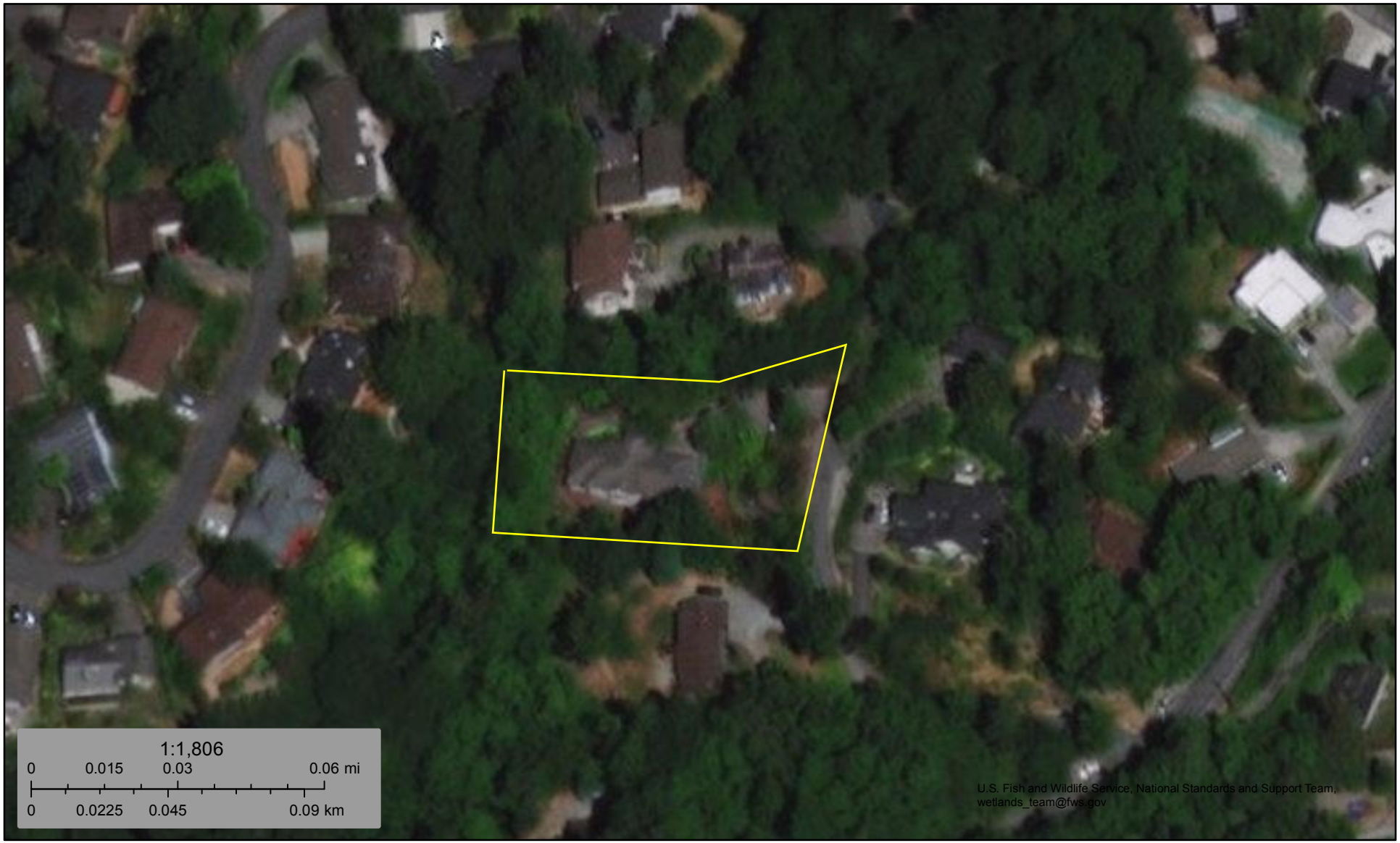


Notes


King County iMap
iMap home
Legend
King County Address Points
Address points
Address labels
Property Layers
Parcels
Environmentally Sensitive Areas
Potential landslide hazard areas (2016, see explanation--->)
Potential steep slope hazard areas (2016, see explanation--->)
Erosion hazard (1990 SAO)
Seismic hazard (1990 SAO)
Coal mine hazard (1990 SAO)
Stream (1990 SAO)
class 1
class 2 perennial
class 2 salmonid
class 3
unclassified
Wetland (1990 SAO)
Sensitive area notice on title
7250
7400
7260
7244
7235
7232
7272
7402
7405
7401
7430
7254
7404
7408
7436
7258
7410
7406
7446
7417
7414
7505
7507
7414
7421
7420
7452
7428
7511
7424
7536
7545
7430
7523
7435
7439
7615
7615
7625
7627
92nd Pl SE
SE 76th St
E Mercer Way
40m
100ft
47.53390 -122.21803 Degrees

U.S. Fish and Wildlife Service
National Wetlands Inventory

# 92nd Avenue Southeast




March 4, 2019

**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.

# Custom Soil Resource Report
## Soil Map


Map Scale: 1:1,610 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

## 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: King County Area, Washington
Survey Area Data: Version 14, Sep 10, 2018

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

Date(s) aerial images were photographed: Aug 31, 2013—Oct 6, 2013

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 |
|---|---|---|---|
| AgB | Alderwood gravelly sandy loam, 0 to 8 percent slopes | 4.6 | 34.7% |
| KpD | Kitsap silt loam, 15 to 30 percent slopes | 8.7 | 65.3% |
| **Totals for Area of Interest** | | **13.4** | **100.0%** |

# Map Unit Descriptions

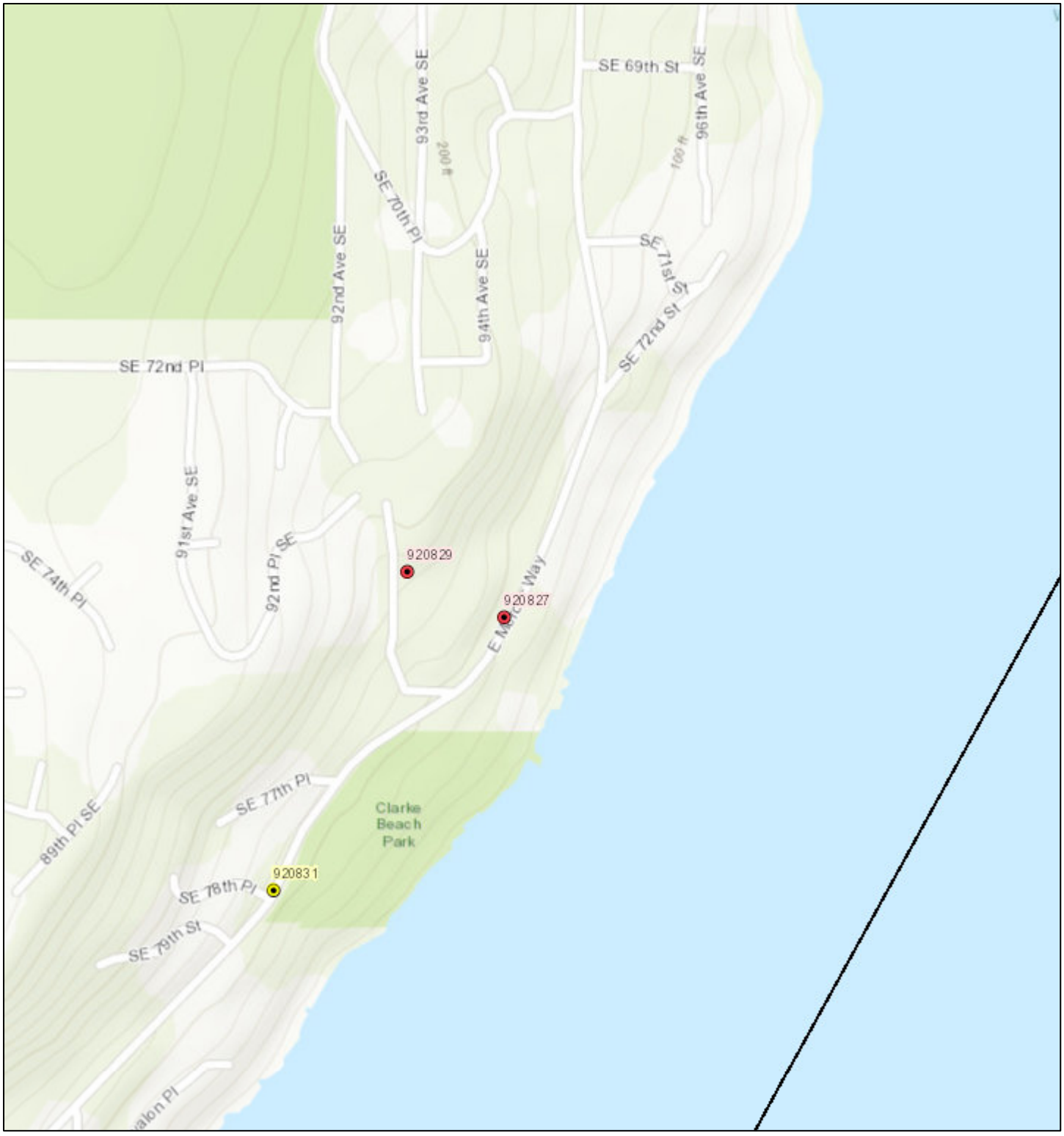
The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

# 92nd Avenue Southeast




March 4, 2019

1:9,028

0 0.075 0.15 0.3 mi

0 0.1 0.2 0.4 km

All SalmonScape Species

**Culverts**

- Total Blockage
- Total Blockage, Fishway Present
- Partial Blockage
- Partial Blockage, Fishway Present
- Unknown Blockage
- Unknown Blockage, Fishway Present

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), swisstopo, © OpenStreetMap contributors, and the GIS User Community
WDFW

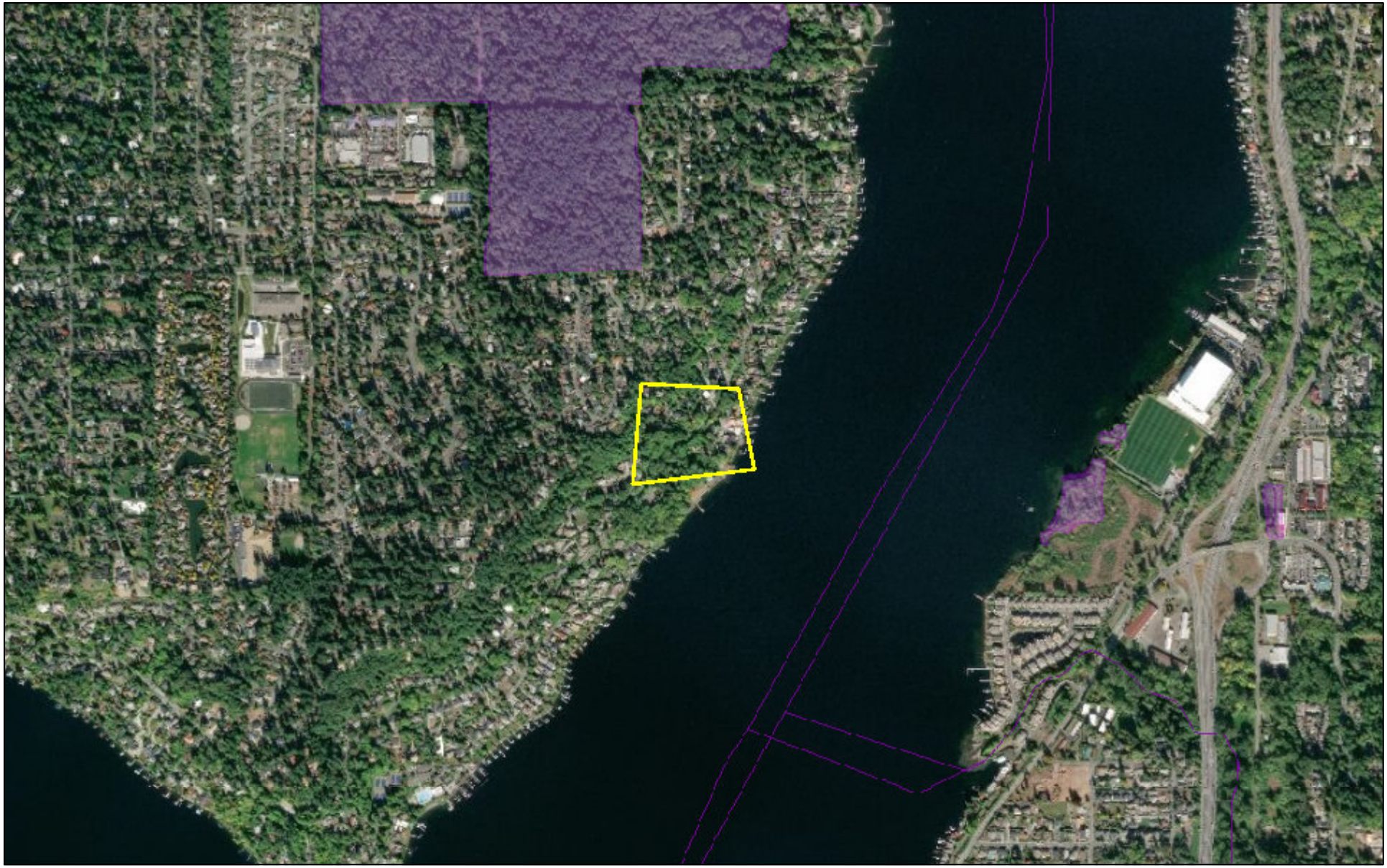
# WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
# PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPlusPublic
REPORT DATE: 03/04/2019 12.10

Query ID: P190304120940

| | | | | | | |
|---|---|---|---|---|---|---|
| Common Name | Site Name | Priority Area | Accuracy | Federal Status | Sensitive Data | Source Entity |
| Scientific Name | Source Dataset | Occurrence Type | | State Status | Resolution | Geometry Type |
| | Source Record | More Information (URL) | | PHS Listing Status | | |
| Notes | Source Date | Mgmt Recommendations | | | | |

# WDFW Test Map



March 4, 2019

PHS Report Clip Area

PT

LN

**POLY**

AS MAPPED

SECTION

QTR-TWP

TOWNSHIP

1:19,842

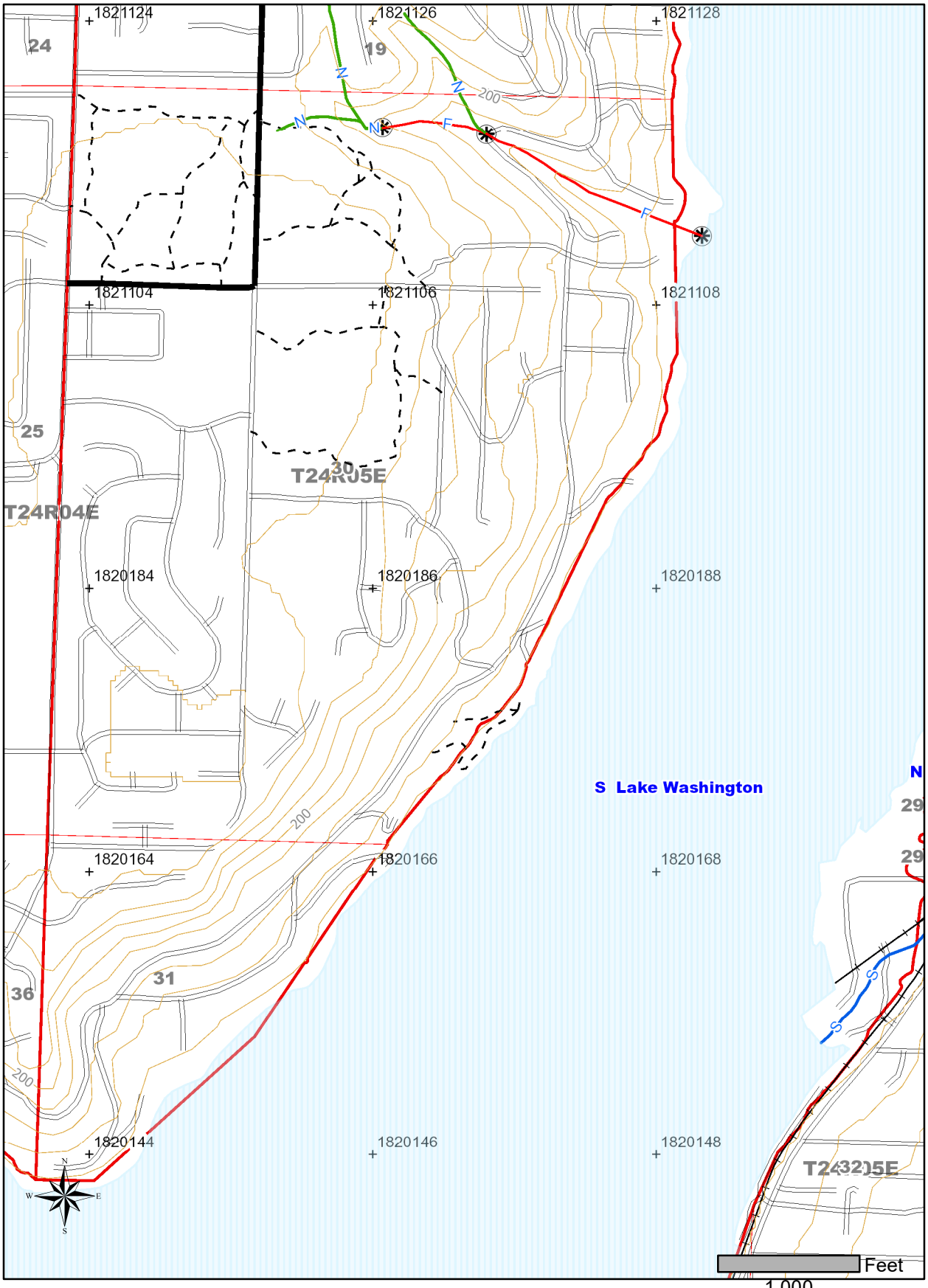
0 0.15 0.3 0.6 mi

0 0.275 0.55 1.1 km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

# Forest Practices Activity Map--92nd Ave SE

Application #:




Please use the legend from the FPA Instruction or provide a list of symbols used.

Date: 3/4/2019 Time: 12:11:35 PM

NAD 83 Scale: 1:12,000

Contour Interval: 40 Feet

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# Appendix B
## Wetland Delineation Data Forms

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

Project/Site: Lai Residence City/County: Mercer Island / King Sampling Date: 3/15/19

Applicant/Owner: Lai State: WA Sampling Point: TP1

Investigator(s): KAM / SRV Section, Township, Range: 30S, T24N, R05E

Landform (hillslope, terrace, etc.): Slope / Terraces Local relief (concave, convex, none): none / slope Slope (%): >30%

Subregion (LRR): A Lat: 47.535534 Long: -122.216389 Datum: _____

Soil Map Unit Name: Kitsap Silt loam NWI classification: None

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

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

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

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

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

Remarks: Slope wetland in Him. Blackberry thicket Fieldwork following an especially cold, wet February. sunny weather

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 10') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 0 = Total Cover | | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. Him. Blackberry | 100 | ✓ | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 100 = Total Cover | | |
| **Herb Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 0 = Total Cover | | |
| **Woody Vine Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| | 0 = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = ____

**Hydrophytic Vegetation Indicators:**

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

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

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

Remarks:

## SOIL

Sampling Point: TP-1

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

| Depth (inches) | Matrix Color (moist) | Matrix % | Redox Features Color (moist) | Redox Features % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-3 | 7.5 YR 4/2 | 100 | | | | | Si Hy clay loam | |
| 3-12 | 10YR 5/2 | 100 | 10YR 5/6 | 40 | C | M | Si Hy clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

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

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

**Hydric Soil Present?** Yes ☑ No ☐

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

Saturation Present? (includes capillary fringe) Yes ☑ No ____ Depth (inches): 0

**Wetland Hydrology Present?** Yes ☑ No ☐

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

Remarks:

Sat. soils w/in 2 ft of pit

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

Project/Site: Lai Residence City/County: Mercer Island/King Sampling Date: 3/15/17
Applicant/Owner: Dexter Lai State: WA Sampling Point: TP2
Investigator(s): KAM/SRV Section, Township, Range: 30S, T24N, R05E
Landform (hillslope, terrace, etc.): terraces Local relief (concave, convex, none): none Slope (%): 15-30
Subregion (LRR): A Lat: 47.535534 Long: -122.216389 Datum:
Soil Map Unit Name: Kitsap silt loam NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Fieldwork following especially cold, wet February. Transition zone

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 10') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | 0 | = Total Cover | |
| **Sapling/Shrub Stratum** (Plot size: 10') | | | |
| 1. ALNRU | 100 | ✓ | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 100 | = Total Cover | |
| **Herb Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 0 | = Total Cover | |
| **Woody Vine Stratum** (Plot size: 10') | | | |
| 1. | | | |
| 2. | | | |
| | 0 | = Total Cover | |

% Bare Ground in Herb Stratum 0

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A =

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

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

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

Remarks:
Sword fern present @ ~ 1.5' elevation higher

## 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 Color (moist) | % | Redox Features Color (moist) | % | Type[1] | Loc[2] | Texture | Remarks |
|---|---|---|---|---|---|---|---|---|
| 0-10 | 10YR 5/2 | 85 | 10YR 5/6 | 15 | C | M | silty clay loam | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

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

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

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

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

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

Remarks:

No observed hydrology

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

Project/Site: Lai Residence City/County: City of Mercer Island / King Sampling Date: 2/15/19

Applicant/Owner: Dexter Lai State: WA Sampling Point: TP-3

Investigator(s): KAM / SRV Section, Township, Range: 30S, T24N, R05E

Landform (hillslope, terrace, etc.): Terraces Local relief (concave, convex, none): none Slope (%): 15-30

Subregion (LRR): A Lat: 47.535534 Long: -122.216389 Datum:

Soil Map Unit Name: Kitsap silt loam NWI classification: None

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

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

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

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

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

Remarks: Fieldwork following an especially cold, wet February

### VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 10') | Absolute % Cover | Dominant Species? | Indicator Status |
|---|---|---|---|
| 1. B.L. maple | 100 | ✓ | FACU |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | = Total Cover | | |

| Sapling/Shrub Stratum (Plot size: 10') | | | |
|---|---|---|---|
| 1. H. Blackberry | 100 | | FAC |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | 100 = Total Cover | | |

| Herb Stratum (Plot size: 10') | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| 11. | | | |
| | 0 = Total Cover | | |

| Woody Vine Stratum (Plot size: 10') | | | |
|---|---|---|---|
| 1. | | | |
| 2. | | | |
| | 0 = Total Cover | | |

% Bare Ground in Herb Stratum 0

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

| Total % Cover of: | | Multiply by: | |
|---|---|---|---|
| OBL species | 0 | x 1 = | 0 |
| FACW species | 0 | x 2 = | 0 |
| FAC species | 100 | x 3 = | 300 |
| FACU species | 100 | x 4 = | 400 |
| UPL species | 0 | x 5 = | 0 |
| Column Totals: | 200 (A) | | 700 (B) |

Prevalence Index = B/A = 700/200 =

**Hydrophytic Vegetation Indicators:**

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

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

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

Remarks:

## SOIL

Sampling Point: TP-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 |
|---|---|---|---|---|---|---|---|---|
| 0-12 | 10YR4/2 | 100 | | | | | loam w/ gravel | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

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

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

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

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

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

**Restrictive Layer (if present):**

Type: _____

Depth (inches): _____

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

Remarks:

## HYDROLOGY

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

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

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

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

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

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

Remarks:

# Appendix C
## Wetland Rating Forms

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for double-sided printing

Wetland name or number A

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

Name of wetland (if known): Wetland A Date of site visit: 3/15/19

Rated by Suzanne Vieira, WPIT Trained by Ecology? Yes X No___ Date of training 10/2018

SEC: 30 TWNSHP: 24N RNGE: 05E Is S/T/R in Appendix D? Yes___ No X

**Map of wetland unit: Figure 1** **Estimated size** 856.5 ft²

## SUMMARY OF RATING

**Category based on FUNCTIONS provided by wetland**

**I___ II___ III___ IV X**

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

| | |
|---|---|
| Score for Water Quality Functions | 4 |
| Score for Hydrologic Functions | 6 |
| Score for Habitat Functions | 3 |
| **TOTAL score for Functions** | 13 |

**Category based on SPECIAL CHARACTERISTICS of wetland**

**I___ II___ Does not Apply X**

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

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

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

Wetland name or number A

## Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

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

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

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

Wetland name or number A

## Classification of Wetland Units in Western Washington

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

**1.** Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?

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

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? **YES – Freshwater Tidal Fringe NO – Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. ).

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

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

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

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

___ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;

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

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

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

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

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

✓ The water leaves the wetland **without being impounded**?

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

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

Wetland name or number A

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

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

____ The overbank flooding occurs at least once every two years.

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

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

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

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

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

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

**8.** Your wetland unit seems to be difficult to classify and probably contains several different HGM clases. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

| *HGM Classes within the wetland unit being rated* | *HGM Class to Use in Rating* |
|---|---|
| Slope + Riverine | Riverine |
| Slope + Depressional | Depressional |
| Slope + Lake-fringe | Lake-fringe |
| Depressional + Riverine along stream within boundary | Depressional |
| Depressional + Lake-fringe | Depressional |
| Salt Water Tidal Fringe and any other class of freshwater wetland | Treat as ESTUARINE under wetlands with special characteristics |

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

Wetland name or number A

| | Slope Wetlands<br>WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality | Points (only 1 score per box) |
|---|---|---|
| S | **S 1. Does the wetland unit have the potential to improve water quality?** | *(see p.64)* |
| S | S 1.1 Characteristics of average slope of unit:<br>Slope is1% or less *(a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance)* points = 3<br>Slope is 1% - 2% points = 2<br>Slope is 2% - 5% points = 1<br>Slope is greater than 5% points = 0 | 0 |
| S | S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)*<br>YES = 3 points NO = 0 points | 0 |
| S | S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants:<br>*Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.*<br>Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6<br>Dense, uncut, herbaceous vegetation > 1/2 of area points = 3<br>Dense, woody, vegetation > ½ of area points = 2<br>Dense, uncut, herbaceous vegetation > 1/4 of area points = 1<br>Does not meet any of the criteria above for vegetation points = 0<br>Aerial photo or map with vegetation polygons | Figure 1 ←<br>2 |
| S | **Total for S 1** *Add the points in the boxes above* | 2 |
| S | **S 2. Does the wetland unit have the opportunity to improve water quality?**<br>Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.*<br>— Grazing in the wetland or within 150ft<br>— Untreated stormwater discharges to wetland<br>— Tilled fields, logging, or orchards within 150 feet of wetland<br>✓ Residential, urban areas, or golf courses are within 150 ft upslope of wetland<br>— Other<br>**YES** multiplier is **2** **NO** multiplier is **1** | *(see p.67)*<br>multiplier<br>2 |
| S | **TOTAL - Water Quality Functions** Multiply the score from S1 by S2<br>***Add score to table on p. 1*** | 4 |

**Comments**

Wetland name or number A

| | Slope Wetlands<br>HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream erosion | Points (only 1 score per box) |
|---|---|---|
| | **S 3. Does the wetland unit have the potential to reduce flooding and stream erosion?** | *(see p. 68)* |
| S | S 3.1 Characteristics of vegetation that reduce the velocity of surface flows during storms.<br>*Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8in), or dense enough, to remain erect during surface flows)*<br>Dense, uncut, **rigid** vegetation covers > 90% of the area of the wetland. (points = 6)<br>Dense, uncut, **rigid** vegetation > 1/2 area of wetland points = 3<br>Dense, uncut, **rigid** vegetation > 1/4 area points = 1<br>More than 1/4 of area is grazed, mowed, tilled or vegetation is not rigid points = 0 | 6 |
| S | S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows:<br>The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2<br>(NO) points = 0 | 0 |
| S | *Add the points in the boxes above* | 6 |
| S | **S 4. Does the wetland have the opportunity to reduce flooding and erosion?**<br>Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? *Note which of the following conditions apply.*<br>— Wetland has surface runoff that drains to a river or stream that has flooding problems<br>— Other_____<br>*(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam)*<br>**YES** multiplier is **2** (**NO**) multiplier is **1** | *(see p. 70)*<br>multiplier<br>1 |
| S | **TOTAL - Hydrologic Functions** Multiply the score from S 3 by S 4<br>***Add score to table on p. 1*** | 6 |

**Comments**

Wetland name or number A

| ***These questions apply to wetlands of all HGM classes.*** HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat | **Points** (only 1 score per box) |
|---|---|
| **H 1. Does the wetland unit have the potential to provide habitat for many species?** | |
| H 1.1 Vegetation structure *(see p. 72)*<br>*Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.*<br>___Aquatic bed<br>___Emergent plants<br>✓ Scrub/shrub (areas where shrubs have >30% cover)<br>___Forested (areas where trees have >30% cover)<br>*If the unit has a forested class check if:*<br>___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<br>*Add the number of vegetation structures that qualify. If you have:*<br>4 structures or more points = 4<br>3 structures points = 2<br>2 structures points = 1<br>1 structure points = 0<br>Map of Cowardin vegetation classes | Figure 1<br>0 |
| H 1.2. Hydroperiods *(see p. 73)*<br>*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 acre to count. (see text for descriptions of hydroperiods)*<br>___Permanently flooded or inundated — 4 or more types present — points = 3<br>___Seasonally flooded or inundated — 3 types present — points = 2<br>___Occasionally flooded or inundated — 2 types present — point = 1<br>✓ Saturated only — 1 type present — points = 0<br>___Permanently flowing stream or river in, or adjacent to, the wetland<br>✓ Seasonally flowing stream in, or adjacent to, the wetland<br>___***Lake-fringe wetland* = 2 points**<br>___***Freshwater tidal wetland* = 2 points**<br>Map of hydroperiods | Figure 1<br>1 |
| H 1.3. Richness of Plant Species *(see p. 75)*<br>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)*<br>*You do not have to name the species.*<br>*Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle*<br>If you counted: > 19 species points = 2<br>*List species below if you want to:* 5 - 19 species points = 1<br>< 5 species points = 0<br>Himalayan blackberry<br>Sword fern<br>Red alder | 0 |

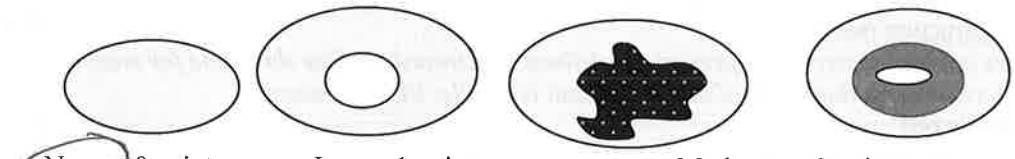
Total for page 1

Wetland name or number A

H 1.4. Interspersion of habitats *(see p. 76)*

Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

Figure 1



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

0

High = 3 points  [riparian braided channels]

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

H 1.5. Special Habitat Features: *(see p. 77)*

*Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.*

____Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).

____Standing snags (diameter at the bottom > 4 inches) in the wetland

____Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

____Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)*

____At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. *(structures for egg-laying by amphibians)*

____ Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

0

**H 1. TOTAL** Score - potential for providing habitat

*Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5*

1

**Comments**

Wetland name or number A

**H 2. Does the wetland unit have the opportunity to provide habitat for many species?**

H 2.1 Buffers *(see p. 80)* — Figure 1

*Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."*

— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5**

— 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4**

— 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**

— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . **Points = 3**

— 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3**

**If buffer does not meet any of the criteria above**

— No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**

— No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**

— Heavy grazing in buffer. **Points = 1**

— Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland **Points = 0.**

✓ — Buffer does not meet any of the criteria above. **Points = 1**

Aerial photo showing buffers

1

H 2.2 Corridors and Connections *(see p. 81)*

H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (*dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor*).

YES = **4 points** (*go to H 2.3*) NO = go to H 2.2.2

H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR** a **Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above?

YES = **2 points** (*go to H 2.3*) NO = H 2.2.3

H 2.2.3 Is the wetland:

within 5 mi (8km) of a brackish or salt water estuary OR
within 3 mi of a large field or pasture (>40 acres) OR
within 1 mi of a lake greater than 20 acres?

YES = **1 point** NO = **0 points**

1

Total for page 2

Wetland name or number A

H 2.3 Near or adjacent to other priority habitats listed by WDFW ***(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm )***

Which of the following priority habitats are within 330ft (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.*

____**Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre).

____**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 p. 152*).

____**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 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; crown cover may be less that 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:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*).

____**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*).

____**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: pp. 167-169 and glossary in Appendix A).*

____**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 7.6 m (25 ft) high and occurring below 5000 ft.

____**Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

____**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 > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long.

If wetland has **3 or more** priority habitats = **4 points**
If wetland has **2** priority habitats = **3 points**
If wetland has **1** priority habitat = **1 point**
No habitats = 0 points

*Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)*

0

Wetland name or number A

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

Wetland name or number A

## CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

| **Wetland Type**<br>*Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.* | **Category** |
|---|---|
| **SC 1.0 Estuarine wetlands** *(see p. 86)*<br>Does the wetland unit meet the following criteria for Estuarine wetlands?<br>— The dominant water regime is tidal,<br>— Vegetated, and<br>— With a salinity greater than 0.5 ppt.<br>YES = Go to SC 1.1 NO ✓ | |
| SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?<br>YES = Category I NO go to SC 1.2 | **Cat. I** |
| SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I NO = Category II<br>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre.<br>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.<br>— The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. | **Cat. I**<br>**Cat. II**<br>**Dual rating I/II** |

Wetland name or number A

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

Wetland name or number A

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|---|---|
| **SC 4.0 Forested Wetlands** *(see p. 90)*<br>Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its functions.*<br>— **Old-growth forests**: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more.<br>NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.<br>— **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm); crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.<br>YES = Category I NO X not a forested wetland with special characteristics | **Cat. I** |
| **SC 5.0 Wetlands in Coastal Lagoons** *(see p. 91)*<br>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?<br>— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks<br>— The lagoon in which the wetland is located contains surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)*<br>YES = Go to SC 5.1 NO X not a wetland in a coastal lagoon<br><br>SC 5.1 Does the wetland meets all of the following three conditions?<br>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).<br>— At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.<br>— The wetland is larger than 1/10 acre (4350 square feet)<br>YES = Category I NO = Category II | **Cat. I**<br><br>**Cat. II** |

Wetland name or number A

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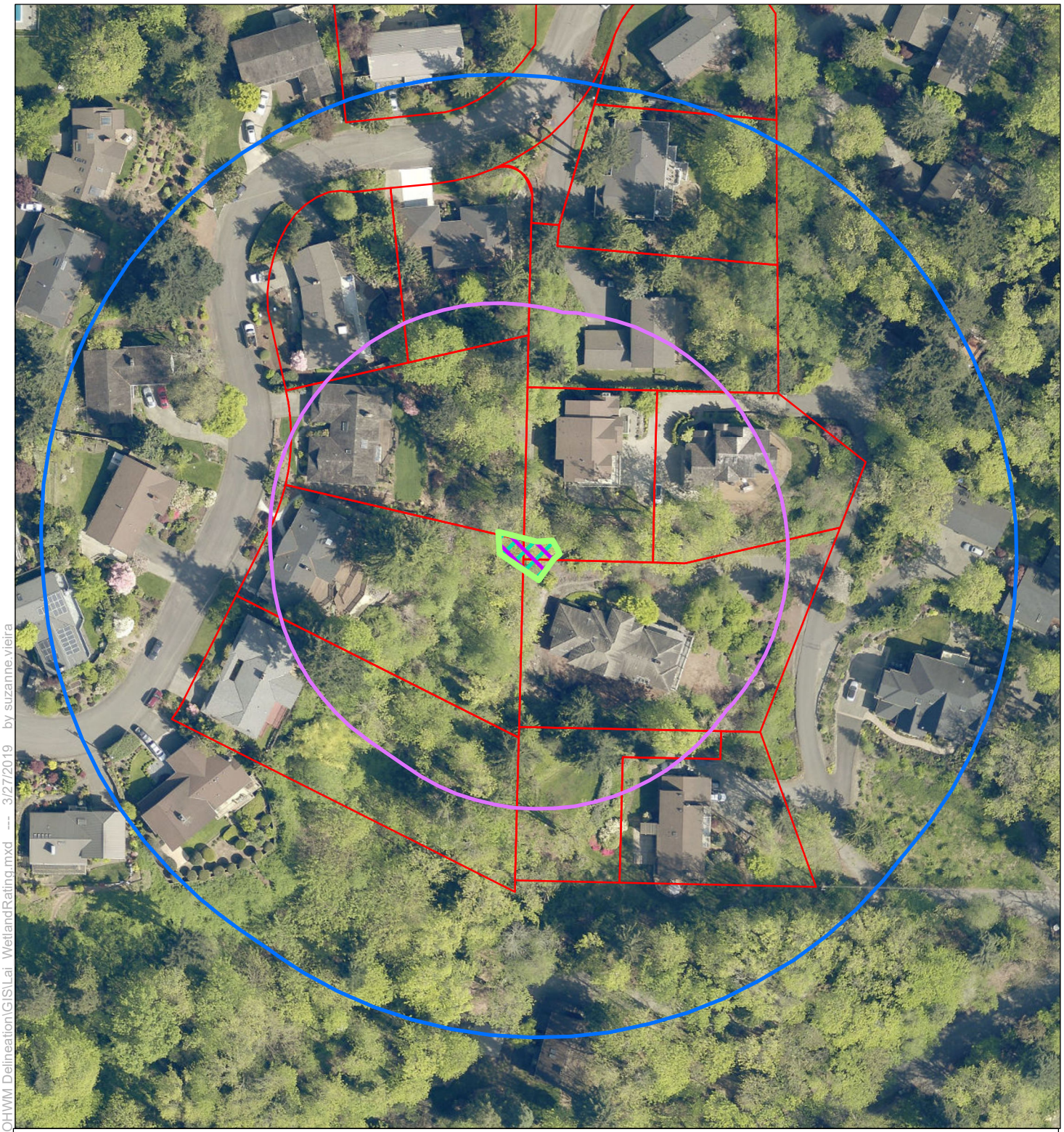
|---|---|
| **SC 6.0 Interdunal Wetlands** *(see p. 93)*<br>Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?<br>YES - go to SC 6.1 NO X not an interdunal wetland for rating<br>***If you answer yes you will still need to rate the wetland based on its functions.***<br>In practical terms that means the following geographic areas:<br>• Long Beach Peninsula- lands west of SR 103<br>• Grayland-Westport- lands west of SR 105<br>• Ocean Shores-Copalis- lands west of SR 115 and SR 109<br>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is once acre or larger?<br>YES = Category II NO – go to SC 6.2<br>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?<br>YES = Category III | **Cat. II**<br><br>**Cat. III** |
| **Category of wetland based on Special Characteristics**<br>*Choose the "highest" rating if wetland falls into several categories, and record on p. 1.*<br>If you answered NO for all types enter "Not Applicable" on p.1 | |



Delineated Wetland Boundary
Hydroperiod--Saturated Only
Dense, Woody Vegetation (PSS3D)
Wetland Buffer--50m
Wetland Buffer--100m
Parcels

N

0 40 80 120 160 Feet

0 10 20 30 40 Meters

Document Path: J:\Laj_001239\001239-001_OHWM Delineation\GIS\Laj_WetlandRating.mxd --- 3/27/2019 by suzanne.vieira

# Appendix D
## Site Photographs

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**Photo 1—Steep slope to north of stream channel.**

**Photo 2—Steep slope to west of stream channel. This slope is the location of Wetland A. Note the dense Himalayan blackberry cover.**

**Photo 3—View of the headwaters of the off-site portion of the stream channel, facing east-northeast.**


**Photo 4—Wetland A, looking upslope and westward. Red arrows indicate the location of test plots (TP) and wetland boundary flags.**

**Photo 5—OHWM flags OHLB0 and OHHRB0. This image shows the headwaters of the stream channel where the wetland outlets, looking northwest.**


**Photo 6—Non-hydric soils at TP-2.**

**Photo 7—Location of TP-1 on blackberry-covered steep slope to north of stream headwaters.**

P

**Photo 8—Delineated OHWM, facing east. Red arrows show location of visible pin flags.**

**Photo 9—Delineated OHWM, facing east. Red arrows indicate the location of visible pin flags.**

**Photo 10—Delineated OHWM, facing west. Red arrows show location of visible pin flags.**

**Photo 11—Driveway to 7511 92nd Avenue Southeast. The stream channel is conveyed under this driveway by a culvert.**

**Photo 12—Delineated OHWM below the driveway, facing north. Red arrows show location of pin flags.**

**Photo 13—Stream channel below the extent of delineation, facing southeast.**


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