

Green to Cedar Trail Phase Critical Areas Report

Prepared for



September 2023

Prepared by

Parametrix

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Prepared for

King County Parks

Prepared by

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CITATION

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ACRONYMS AND ABBREVIATIONS

BMP	best management practice
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
Ecology	Washington State Department of Ecology
FAC	facultative
FACW	facultative wetland
HGM	hydrogeomorphic
KCC	King County Code
NWI	National Wetlands Inventory
OBL	obligate
OHWM	ordinary high water mark
PHS	Priority Habitats and Species
PWS	Professional Wetland Scientist
SWIFD	Statewide Integrated Fish Distribution
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDNR	Washington State Department of Natural Resources

1. INTRODUCTION

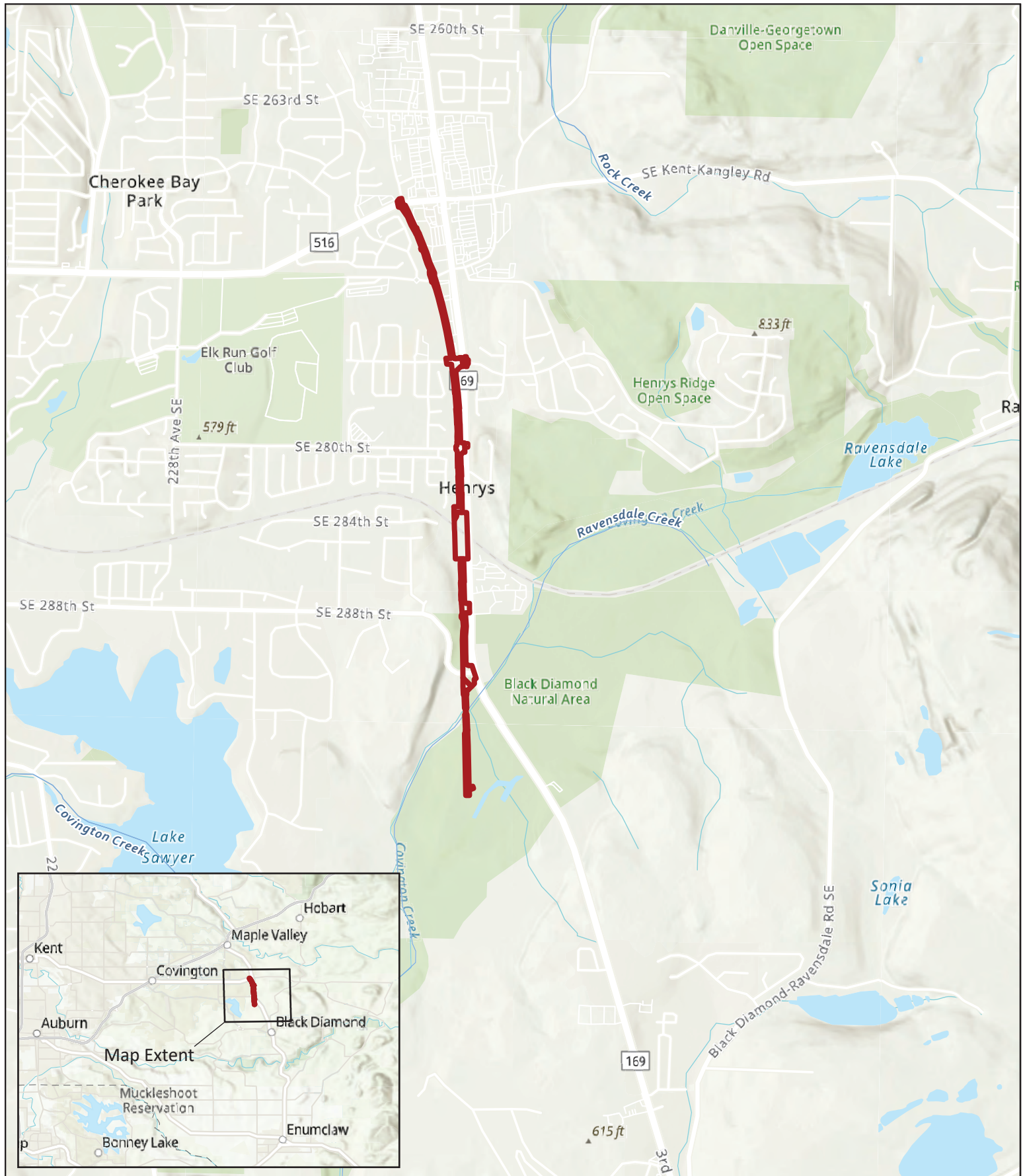
This report describes the critical areas assessment conducted for the Green to Cedar Trail South Interim Segment A (the project). The project will develop a 1.8 mile long nonmotorized, soft-surface, multiuse trail and is proposed by King County Parks. The project extends from within City of Maple Valley limits to unincorporated King County. The project connects to previously completed trail and bridge work over Ravensdale Creek. The study area is located in the unincorporated King County limits of the project, near Black Diamond, Washington (Figure 1-1).

The study area for the project includes the project ground disturbance limits (project area) as well as adjacent areas that might affect the extent of critical area buffers within the project area. Ordinary high water mark (OHWM) delineation of the wetland and aquatic area (stream) was restricted to the project area. Wetland and aquatic area boundaries were estimated outside of this area. All other critical areas are assessed based on existing mapped data from King County and compared to the project site in a geographic information system.

This report intends to document the critical areas within the project area, provide impact calculations, and discuss mitigation requirements. Per King County Code (KCC) 21A.24, critical areas include:

- Aquatic areas (including streams)
- Coal mine hazard areas
- Critical aquifer recharge area
- Erosion hazard areas
- Flood hazard areas
- Landslide hazard areas
- Seismic hazard areas
- Steep slope hazard areas
- Volcanic hazard areas
- Wetlands
- Wildlife habitat conservation areas
- Wildlife habitat networks

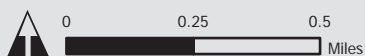
The project area is located in the City of Maple Valley and unincorporated King County, Washington, Section 3, Township 21 North, Range 06 East.



Date: 4/10/2023
 Sources: ESRI
 Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

 Project Area

Figure 1-1 Vicinity Map
 Green to Cedar Rivers Trail



2. METHODS

This critical area investigation is based on data obtained through a review of existing information followed by field investigations. The goal of these efforts was to document existing information to reflect current site conditions and to collect new information necessary to assess stream and wetland boundaries. Literature and data were also reviewed to identify and characterize potentially affected wildlife resources in and near the project area.

2.1 Review of Existing Information

Prior to conducting the field investigation, project biologists reviewed the following maps and materials for critical area locality and presence:

- **Aquatic areas (including streams)**
 - Aerial photography of the project corridor (King County 2023)
 - Statewide Integrated Fish Distribution (SWIFD) (NWIFC 2023)
 - Water Quality Assessment and Clean Water Act (CWA) Section 303(d) list prepared by the Washington State Department of Ecology (Ecology 2023)
- **Coal Mine Hazard areas**
 - King County iMap (King County 2023)
- **Critical Aquifer Recharge areas**
 - King County Critical Aquifer Recharge Areas Map (King County 2023)
- **Erosion Hazard areas**
 - King County iMap (King County 2023)
- **Flood Hazard areas**
 - King County iMap (King County 2023)
- **Landslide Hazard areas**
 - King County iMap (King County 2023)
- **Seismic Hazard areas**
 - King County iMap (King County 2023)
- **Steep Slope Hazard areas**
 - King County iMap (King County 2023)
- **Volcanic Hazard areas**
 - Map 14-1 Lahar Inundation Zone (King County 2010)
- **Wetlands**
 - Aerial photography of the project corridor (King County 2023)
 - Climate data for King County as measured at the Seattle Boeing Field (ACIS 2023)
 - King County iMap (King County 2023)
 - National Wetlands Inventory (NWI) data (USFWS 2023)
 - Priority Habitats and Species (PHS) data (WDFW 2023)
 - Washington Department of Natural Resources (WDNR) Natural Heritage Program database (WDNR 2023)

- **Wildlife Habitat Conservation areas**
 - King County Comprehensive Plan (King County 2020)
 - PHS data (WDFW 2023)
 - WDNR Natural Heritage Program database (WDNR 2023)
- **Wildlife Habitat Networks**
 - King County iMap (King County 2023)

2.2 Field Investigation

2.2.1 Wetland Identification and Delineation

The methods to identify and delineate wetlands are in accordance with KCC 21A.24.318.

The methods specified in the U.S. Army Corps of Engineers (Corps) Wetlands Delineation Manual (Corps 1987) and indicators specified in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Corps 2010) were used by project biologists to delineate on-site wetlands.

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. An area must have at least one positive indicator of wetland vegetation, soils, and hydrology to be considered a wetland. The delineated wetlands were surveyed by professional land surveyors. Wetland determination data forms from the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Corps 2010) were completed for each wetland.

Project biologist Josh Wozniak Professional Wetland Scientist (PWS) conducted a field delineation of wetlands and aquatic areas within the project area on October 27, 2022.

2.2.1.1 Vegetation

During the field investigations by project biologists, dominant plant species were observed. The dominant plants and their wetland indicator status were evaluated to determine if the vegetation was hydrophytic. Hydrophytic vegetation is generally defined as vegetation adapted to prolonged saturated soil conditions. To meet the hydrophytic vegetation criterion, more than 50 percent of the dominant plants must be facultative (FAC), facultative wetland (FACW), or obligate (OBL), based on the plant indicator status.

Scientific and common plant names follow generally accepted nomenclature. Most names are consistent with the PLANTS Database (USDA2023) and the National Wetland Plant List (Lichvar et al. 2020). During the field investigations, dominant plant species were observed and recorded on data forms for each sampling point. Lichvar et al. (2020) was also used to assign plant indicator status for observed plant species.

2.2.1.2 Soils

Generally, an area must have hydric soils to be a wetland. Hydric soil forms when soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper layer (Corps 2010). Soils were examined by excavating sample plots to a depth of 16 inches or more to observe soil profiles, colors, and textures. Munsell color charts (Munsell Color 2015) were used as objective standards to describe soil colors.

2.2.1.3 Hydrology

An area is considered to have wetland hydrology when soils are ponded or saturated consecutively for 5 percent of the growing season in most years. In the project area, the growing season, as determined using the Seattle Boeing weather station, is 315 days long and lasts from January 29 to December 10 (ACIS 2022). This means that for 16 consecutive days from January 29 to December 10, areas defined as wetland must be ponded or saturated. The wetlands in the study area are heavily influenced by river flooding and associated water table.

An analysis of the previous 3 months of recorded precipitation at Seattle Boeing Field weather station using the Wetlands Climate Tables found that precipitation was within the normal range for this period (Appendix A). Relevant stream gauge data is also provided in Appendix A.

2.2.2 Stream Identification and Delineation

Stream assessments were based on a review of existing information on previously identified streams and fish use, followed by a field assessment and ordinary high water mark (OHWM) delineation. The OHWM for streams was delineated using the following definition provided in KCC 21A.06.825: "...that mark that will be found by examining the bed and banks of a stream, lake, pond or tidal and ascertaining where the presence and action of water are so common and long maintained in ordinary years as to mark upon the soil a vegetative character distinct from that of the abutting upland." This definition is consistent with Ecology (Anderson et al. 2016) and the definition of "ordinary high water" in WAC 220-660-030.

2.2.3 Wetland and Stream Classification, Rating, and Buffers

Delineated wetlands were classified per the U.S. Fish and Wildlife Service (USFWS) Classification of Wetlands and Deepwater Habitats of the United States (Cowardin 1979; FGDC 2013) and the hydrogeomorphic (HGM) classification system (Brinson 1993). Wetlands in King County are rated using the Department of Ecology's 2014 Washington State Wetland Rating System for Western Washington (Hruby 2014) in accordance with KCC 21A.24.318(A). Wetland buffers are assigned based on wetland category/characteristics and intensity of impact or adjacent land use; they shall be provided from the wetland edge (KCC 21A.24.325).

Streams are classified according to KCC 21A.24.355 and buffers assigned per KCC 21A.24.358.

3. RESULTS

The results of the background information review are presented below. Maps related to the existing information review are presented in Appendix A, wetland determination forms are presented in Appendix B, wetland rating forms are in Appendix C, photographs from the field investigation are in Appendix D, and projects plans are in Appendix E.

3.1 Review of Existing Information

3.1.1 Landscape Setting

The study area is located within the basin in the Water Resource Inventory Area 9: Duwamish/Green.

Land uses within the study area include residential and commercial areas in the northern portion of the project area and forested park land (Black Diamond Open Space) in the southern portion of the project area.

3.1.2 Soils

Seven soil types were identified and mapped within the study area (Figure A-3, Appendix A). The hydric rating indicates the percentage of the mapped unit that meets the criteria for hydric soils (NRCS 2023).

- Alderwood (hydric rating: 5)
- Everett (hydric rating: 6)
- Orcas Peat (hydric rating: 100)

3.1.3 Previously Mapped Aquatic Areas and Wetlands

The study area includes Ravensdale Creek. Wetlands mapped by NWI include palustrine forested and riverine wetlands adjacent to the creek, as well as other wetlands south of the project area (USFWS 2023; Appendix A). King County iMap (2023) maps similar wetland extents and an unnamed tributary.

3.1.3.1 Wildlife Habitat Conservation Areas

The King County Comprehensive Plan (King County 2020) identifies the following areas as Fish and Wildlife Habitat Conservation Areas:

- *Areas with which federal or state listed endangered, threatened, or sensitive species have a primary residence*
- *Habitats of local importance and habitats for species of local importance*

According to the online mapping resources, PHS on the Web (WDFW 2023), and King County data (2023), Ravensdale Creek is a wildlife migration corridor and habitat for several salmonid species. Migratory and resident elk use the winter range. The project area also includes cave-rich areas.

King County describes nine requirements for habitats with local importance/habitats for species with local importance (KCC 21A.24.382). These requirements include the following: bald eagle active nest; great blue heron rookery; marbled murrelet active nest; northern goshawk active nest; osprey active nest; eyrie on a cliff face, rim of the cliff, or area immediately below a cliff utilized by peregrine falcons; spotted owl active nest; caves or mines utilized by Townsend's big-eared bat; and Vaux's swift active nest.

During the site visit, none of the habitat requirements described were observed. Additionally, a search of PHS on the web (WDFW 2023) did not result in any species recorded nearby.

- *Wildlife habitat networks designated by the County*
There are wildlife habitat networks (Ravensdale Creek) mapped within the project area (King County 2023).
- *Commercial and recreational shellfish areas*
The project area does not contain any saltwater habitats.
- *Kelp and eelgrass beds*
The project area does not contain any saltwater habitats.
- *Herring, smelt, and sand lance spawning areas*
The project area does not contain any saltwater habitats.
- *Riparian corridors*
Riparian corridors are associated with the streams within the project area.
- *State aquatic reserves*
There are no state aquatic reserves within the project area.

3.1.3.2 Other Critical Areas

Critical aquifer recharge areas and steep slope hazards occur in the project study area and project area (see maps in Appendix A).

There are no coal mine hazard areas, landslide hazard areas, seismic hazard areas, , or volcanic hazard areas mapped as occurring within the study area (King County 2023).

3.2 Field Investigation

To evaluate conditions that might affect a wide range of alternatives, Josh Wozniak, PWS, conducted a field assessment of wetlands and aquatic areas within the project area on October 27, 2022.

3.2.1 Wetlands

Most of the study area is uplands, with extensive sections in and adjacent to developed residential and commercial areas in the north, and dry, Douglas-fir (*Pseudotsuga menziesii*) forest in and near the Black Diamond Open space. Two wetlands (W1 and W2) occur within the study area (Figure 3-1). Summary of the wetlands within the study area is provided in Table 3-1. General characteristics of wetlands are discussed below.

Table 3-1. Summary of Identified Wetland in the Study Area

Wetland	Jurisdiction	USFWS Classification ^a	HGM Classification ^b	Ecology Rating ^c	Habitat Rating Score ^c	Buffer Width (feet)
W1	King County	PFO, PSS	Riverine	II	8	190
W2	King County	PFO, PSS	Depressional	I (bog)	7	190

^a FGDC 2013; Cowardin et al. 1979

^b Brinson 1993

^c Hruby 2014

PFO = palustrine forested, PSS = palustrine scrub/shrub

3.2.1.1 Wetland 1

Wetland 1 is a forested and scrub-shrub wetland consisting of multiple patches that are located within the channel of Ravensdale Creek. These vegetated islands were grouped in a single rating unit according to the Ecology Rating System (Hruby 2014) based on their proximity to each other. In this section of the river, multiple channels have formed and are actively migrating. Dominant hydrophytic vegetation includes red alder (*Alnus rubra*) and salmonberry (*Rubus spectabilis*). Extensive restoration has recently occurred in this area associated with major fish passage improvements, including a bridge over Ravensdale Creek. The wetland boundary near the proposed project is largely defined by the OHWM of Ravensdale Creek and associated flooding and elevated water table. Adjacent slopes are steep and transition abruptly to upland conditions. Near the project area, these locations have been temporarily disturbed and replanted as part of the completed bridge project.

3.2.1.2 Wetland 2

Wetland 2 is a forested and scrub-shrub wetland that contains an extensive sphagnum peat mat and is considered a bog under King County regulations. Dominant hydrophytic vegetation includes shore pine (*Pinus contorta*), Labrador tea (*Rhododendron groenlandicum*) and other peat-obligate species.

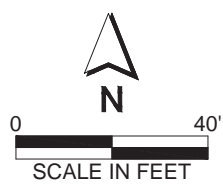
3.2.2 Streams

Two streams occur in the vicinity of the project: Ravensdale Creek and an unnamed stream tributary to the creek. Table 3-2 provides a summary of the streams identified in the study area.

Table 3-2. Summary of Identified Streams in the Study Area

Stream	Jurisdiction	Classification ^a	Buffer Width (feet) ^b
Ravensdale Creek	King County	F	165
Unnamed Stream	King County	F	165

^a F = fish bearing



**Figure 3-1
Green to Cedar Rivers Trail: Interim Segment A
Existing Wetland And Stream Conditions
Sheet 1 of 3**



4. PROJECT IMPACTS

The project will not impact wetlands or streams. The project will have temporary and permanent impacts within the buffer of Ravensdale Creek and Wetland 1. Project impacts are summarized in Table 4-1 and shown in Figure 4-1. All temporary impact areas will be revegetated with native species suitable for the site. Although the areas noted as permanent buffer impact areas will be revegetated with native species, their proximity to the trail and needed safety sightlines will limit tree regrowth in these areas. Therefore, the project proposes designating additional buffer area to provide buffer averaging mitigation. That area is shown in Figure 4-1.

Table 4-1. Green to Cedar River Trail: Interim Segment A Project Impacts

Resource Impacted	Temporary Impacts (acres)	Permanent Impacts (acres)
Buffer of Ravensdale Creek and Wetland 1	0.05	0.05
Streams, Wetlands and Other Aquatic Areas	none	none
Buffer of Wetland 2	none	none

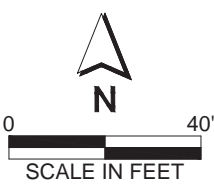
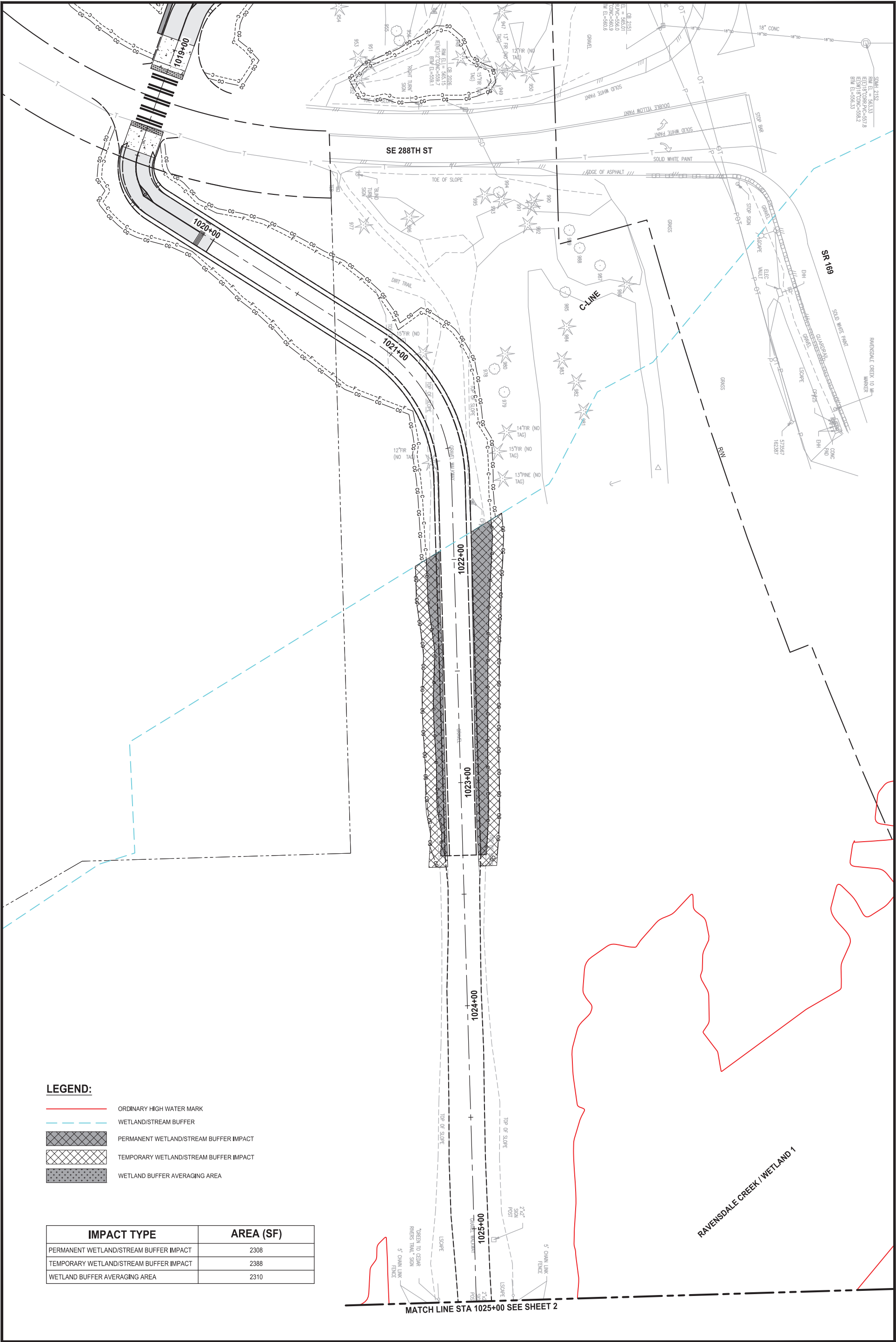


Figure 4-1
Green to Cedar Rivers Trail: Interim Segment A
Project Impacts and Mitigation
Sheet 1 of 2

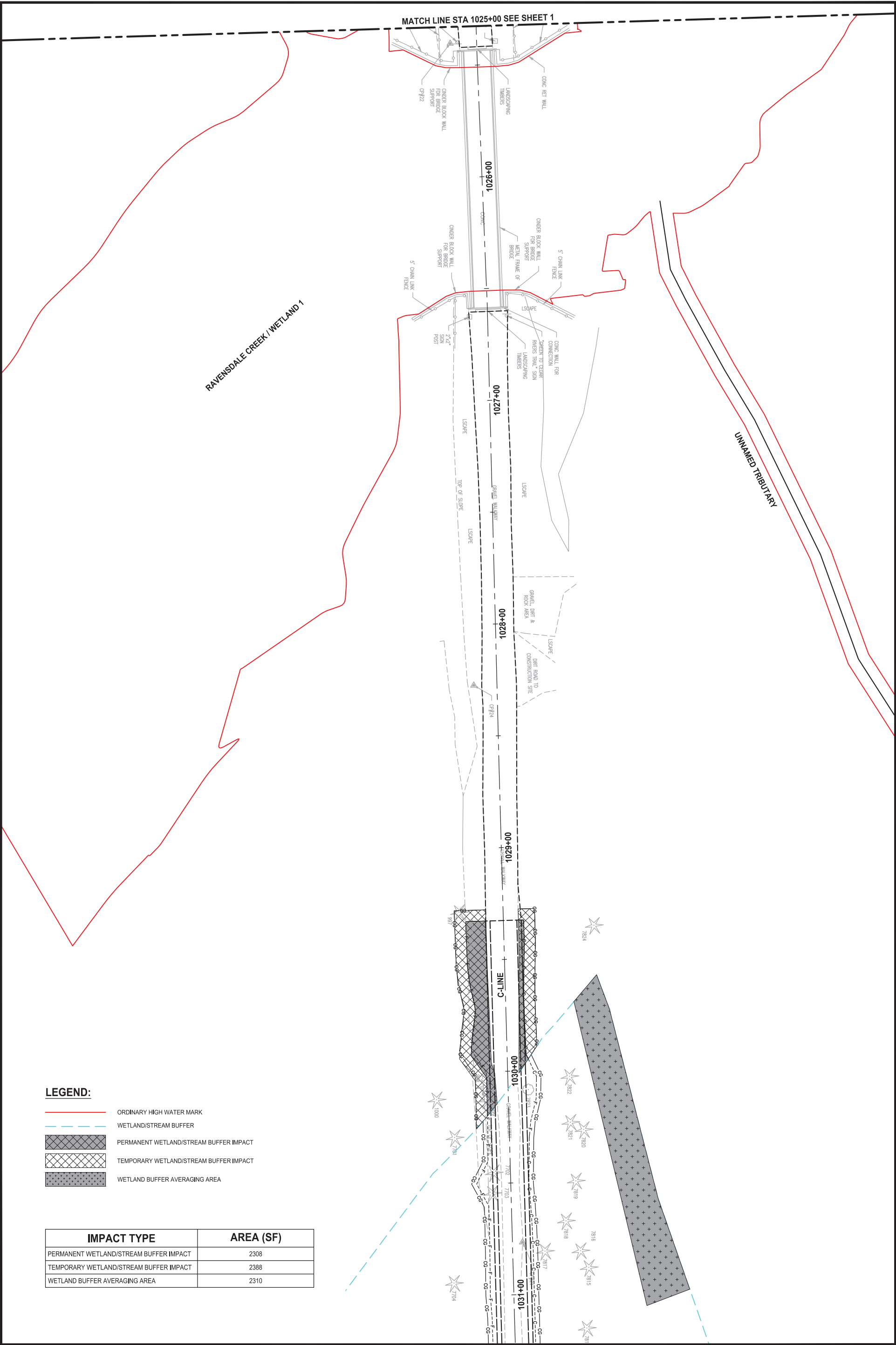


Figure 4-1
Green to Cedar Rivers Trail: Interim Segment A
Project Impacts and Mitigation
Sheet 2 of 2

5. CODE COMPLIANCE: DEVELOPMENT STANDARDS AND MITIGATION REQUIREMENTS

King County regulates the activities within critical areas and their buffers. Alterations to critical areas, except wetlands, may be approved when the following criteria are met (KCC 21A.24.070[3]):

- There is no feasible alternative to the development proposal with less adverse impact on the critical area.
- The alteration is the minimum necessary to accommodate the development proposal.
- The approval does not require the modification of a critical area development standard established by this chapter.
- The development proposal does not pose an unreasonable threat to public health, safety or welfare on or off the development proposal site and is consistent with the general purposes of this chapter and the public interest.
- For dwelling units, no more than five thousand square feet or ten percent of the site, whichever is greater, may be disturbed by structures, building setbacks or other land alteration, including grading, utility installations and landscaping, but not including the area used for a driveway or for an on-site sewage disposal system. When the site disturbance is within a critical area buffer, the building setback line shall be measured from the building footprint to the edge of the approved site disturbance.
- To the maximum extent practical, access is located to have the least adverse impact on the critical area and critical area buffer.
- The critical area is not used as a salmonid spawning area.
- The director may approve an alteration in a category II, III and IV wetland for development of a public school facility.

5.1 Wildlife Habitat Conservation Areas

Per KCC 21A.24.388, adverse impacts to wildlife habitat conservation areas must prevent disturbance of each protected species. On-site mitigation may include management practices, such as the timing of disturbance.

5.2 Wetlands

Development standards and alterations along with specific mitigation requirements are listed in KCC 21A.24.335 and 21A.24.340, respectively, and summarized in the following paragraph.

The applicant shall not introduce any plant or wildlife that is not indigenous to the Puget Sound lowland into any wetland or wetland buffer unless authorized by a state or federal permit or approval. Additionally, all mitigation shall achieve equivalent or greater function; this is achieved through a mitigation area to alteration area ration of 1:1 for wetland buffers.

5.3 Aquatic Areas including Streams

Development standards and alterations along with specific mitigation requirements are listed in KCC 21A.24.365 and 21A. 24.380, respectively, and summarized in the following paragraph.

For all allowed activities within aquatic areas and their buffers, grading activities are restricted to a time frame between May 1 and October 1, unless modified by the department; the moisture-holding capacity of the topsoil layer on all areas of the site not covered by impervious surfaces should be maintained; new structures should be sited to avoid the creation of future hazard trees and to minimize the impact to groundwater movement; the soil duff layer should not be disturbed, but if disturbed, should be redistributed to other areas of the project site where feasible; a spatial connection should be provided between vegetation within and outside the aquatic area buffer to prevent creation of windthrow hazards; and hazard trees should be retained in aquatic area buffers and either topped or pushed over toward the aquatic area.

6. PROJECT MITIGATION

6.1 Mitigation Sequencing

The County requires that project design follow mitigation sequencing requirements. The requirements are as follows:

1. Avoiding impacts altogether by not taking a certain action or parts of an action.
2. Minimizing impacts by limiting the degree of magnitude of the action and its implementation by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts.
3. Rectifying the impact by repairing, rehabilitating or restoring the affected critical area.
4. Reducing or eliminating the impact over time by preservation or maintenance operations during the life of the development proposal.
5. Compensating for the impact by replacing, enhancing, or providing substitute critical areas.
6. Monitoring the impact and taking appropriate corrective measures.

6.1.1 Avoiding and Minimizing Impacts

With the conducting of an alternatives analysis, the proposed alignment and design will balance the needs and uses of the project while minimizing impacts to wetland/stream and buffer areas. The alternative selected had the least impacts to wetlands, aquatic areas, and their buffers. There will be no impacts to wetlands and only temporary impacts to aquatic areas and their buffers.

Construction impacts will be minimized by using temporary erosion and sediment control procedures as well as appropriate best management practices (BMPs). Potential BMPs for erosion and sediment control include, but will not be limited to, placement of silt barriers or straw bales/matting, as necessary. All erosion control measures will be inspected regularly to ensure adequacy and to assess maintenance needs. A spill prevention control and countermeasure plan will also be implemented during construction activities.

The following conservation measures and BMPs have been incorporated into the project design to avoid or minimize construction-related impacts on aquatic and riparian habitats:

- Earthwork and clearing near streams will be limited to the dry season to reduce the potential for sediment runoff to the extent practical.
- The boundaries of clearing limits will be clearly flagged to prevent disturbance outside of the limits. The contractor must install high-visibility fencing.

6.1.2 Rectifying and Reducing Impacts

Following construction, all temporarily impacted buffer areas will be restored to existing conditions or better. The temporarily impacted areas will be replanted with native trees and shrubs. Impacts will be reduced over the long term through the building of a durable facility planted with resilient native species.

6.1.3 Compensatory Mitigation

The project will compensate for permanent buffer impacts through buffer averaging. See Figure 4-1 and Appendix E.

6.1.4 Performance Monitoring

The project will conduct performance monitoring of the mitigation and restoration site. Performance monitoring is described below in Section 6.5.

6.2 Mitigation Goals, Mitigation Objectives, and Performance Standards

The goal of the mitigation plan will be achieved through the objectives listed below that, along with associated performance standards, are discussed in the following sections.

6.2.1 Mitigation Goal

The overall goal of the mitigation and restoration plan is to improve the hydrologic, water quality, and habitat functions of wetland/stream and buffer areas.

6.2.2 Mitigation Objectives

The mitigation goal will be achieved through the following objectives:

- Improve hydrologic, water quality, and habitat functions by restoring and enhancing buffer areas.
- Improve habitat for wildlife with habitat logs.

6.2.3 Performance Criteria

A set of specific performance standards has been established to correspond with the stated mitigation objectives. These standards serve as benchmarks to evaluate the success of the mitigation project. By monitoring the mitigation project and comparing the results to performance standards, biologists will be able to determine whether a contingency plan should be implemented. Planted mitigation areas will include wetland and buffer enhancement areas, wetland/stream reestablishment areas, and restoration areas. The performance standards for all mitigation areas are as follows:

Year 0:

- Area is graded according to the approved mitigation plan (or approved modifications to this plan).
- Temporarily impacted surface soils are restored to pre-disturbance conditions.
- Habitat features are installed and counted.

All Years:

- Invasive species, such as non-native blackberry, will occupy no more than 10 percent areal cover in each mitigation area. Reed canarygrass cover will decline in each year, with a total reduction of 50 percent by the end of the monitoring period.
- Any regulated noxious weeds in King County be absent after Year 1 in the mitigation areas.
- Complete eradication (0 percent cover) of Class A invasive plants in King County and non-native knotweed species and species hybrids (e.g., *Polygonum cuspidatum*, *P. sachalinense*, *P. x bohemicum*).
- All installed habitat features are present and in good condition.

Year 1

- By the end of the first growing season, 100 percent of the planted native species will have survived or will be replaced. The contractor responsible for planting will be required to replant all plants that died following 1 year after initial planting.

Year 2

- Native species (planted and volunteers) will provide at least 15 percent areal cover of the planted areas.

Year 3

- Native species (planted and volunteers) will provide at least 35 percent areal coverage of the planted areas.

Year 5

- Native species (planted and volunteers) will provide at least 50 percent areal coverage of the planted areas.

6.3 Mitigation Implementation Schedule

Table 6-1 outlines the mitigation monitoring schedule for the 5-year monitoring period.

Table 6-1. Mitigation Monitoring Schedule

Mitigation Monitoring Element	Year 0	Year 1	Year 2	Year 3	Year 5
As-built report	x				
Vegetation quantitative		x	x	x	x
Vegetation qualitative	x	x	x	x	x
Invasive species	x	x	x	x	x
Habitat features	x	x	x	x	x
Reporting	x	x	x	x	x

6.4 Baseline Conditions and As-Built Report

The baseline conditions of the restoration and mitigation areas will be established after construction is complete (including plant installation) and approved by the project biologist. This date will constitute the beginning of Year 0. A post-construction site review of the completed work will be conducted by the restoration biologists and the contractor to verify that the plan was properly implemented. This field meeting will identify any discrepancies between the bid documents and the field plantings, including previously approved plant substitutions and/or relocation of plantings. During this period, baseline conditions will be documented in the As-Built Report.

6.4.1 Installed Habitat Structures

The type, number, and location of the installed habitat logs and brush piles will be documented, surveyed, and reported in the Year 0 As-Built Report. In each monitoring year, the structures will be evaluated qualitatively for structural integrity and documented by photographs, taken from established

photo points, and included in the monitoring reports. Photo points will be field-located, surveyed with GPS, and identified on the Year 0 As-Built Report.

6.4.2 Plantings

After plant installation, the perimeter of all mitigation areas will be surveyed with GPS and photographed to document baseline conditions. Contractor records will document the total number of plants planted in each mitigation area.

6.4.3 As-Built Report

The As-Built Report will be prepared to document the baseline conditions. It will include a narrative report, a set of landscape drawings showing changes that occurred during construction relative to the approved plans, and representative photographs. Permanent photo points will be identified with GPS and located on the As-Built Plans. The As-Built Report will include an updated monitoring plan after site construction, which will include the locations of vegetation monitoring transects or plots and photo points. The As-Built Report will be submitted to the Corps and King County after mitigation installation is complete to document baseline site conditions as described above. This report will constitute the Year 0 Monitoring Report.

6.5 Monitoring Plan and Reporting

Effective monitoring, adaptive management, maintenance, and contingency actions are planned to evaluate and ensure that performance standards are met and to correct deficiencies, if needed. Conducting monitoring work and reporting these results for agency review and concurrence will ensure that appropriate contingency actions are taken and ecological benefits are ultimately achieved. This section describes the overall mitigation monitoring that will occur over a 5-year monitoring period to verify that the buffer restoration areas are meeting established performance standards and permit conditions. The monitoring approach for the mitigation project is described here and will be performed in accordance with all conditions of King County and CWA Section 404 Permit, administered by the Corps. If monitoring demonstrates that performance standards are not met, then contingency actions will be evaluated and may be implemented to ensure that the desired aquatic area buffer functions are ultimately provided by the proposed mitigation projects.

The mitigation/restoration areas will be monitored for a 5-year period following construction. Monitoring reports must be prepared in accordance with of King County standards. The monitoring reports will document the project conditions after construction and initiate the monitoring period. Permitted mitigation will be measured by attainment of the performance standards described above. Vegetation communities in all mitigation areas will be established as described in the mitigation plan and drawings.

6.5.1 Vegetation Monitoring

Field monitoring will occur annually for 5 years during August or September (before leaf drop). Quantitative and qualitative monitoring will occur in Years 1, 2, 3, and 5.

Qualitative monitoring will constitute a general visual inspection of each mitigation area when the sites are monitored to determine the condition of the plant materials, the condition of habitat features, and the need to remove invasive plants. Photo points, established in Year 0, within the mitigation areas will permit a visual evaluation of planting success. All permanent photo points will be marked on the mitigation plan for use in the field.

Quantitative monitoring will involve established sampling techniques and data analysis for assessing the condition of the mitigation areas against the stated performance criteria. The results will be compared to the performance standards to determine whether the mitigation areas are developing as predicted and will lead to the Year 5 success standards.

Planting success in all planted mitigation areas will be determined using line-intercept and/or quadrat sampling, depending on the size and configuration of the mitigation area. Percent cover will be estimated using plots or the line-intercept method in established transects for each mitigation area. Percent cover will be measured by using two assessments: (1) cover per species and (2) cover as a group—native woody vegetation. Measurement of individual species coverage will help to determine which plant species are thriving, and measurement of the group of native woody plants (regardless of stratum) will determine whether the performance standard has been met.

When using line-intercept methods, the biologist will walk the entire length of the 100-foot centerline. The biologist will record the areal cover of each species and each group of native woody plants that visually intercept the centerline to the nearest 0.1 foot. It is expected that, as the plants grow, a given area may contain more than one vegetative stratum. Thus, when calculating overall cover per species within a transect, overlapping vegetation could contribute to a total vegetation cover of greater than 100 percent. Calculating the cover of native woody plants as a group will not result in cover greater than 100 percent.

Non-native invasive plants will be recorded per species and reported separately. The data will be used to calculate total percent cover of the native woody group and individual species cover.

Native volunteer trees and shrub cover will be recorded in the quantitative evaluation because the mitigation design anticipates that substantial numbers of volunteer plants will become established. Trees and shrubs established prior to mitigation site installation will not count toward quantitative measurements. The biologists will use their best professional judgment to determine which plants are considered established.

The results of quantitative measurements will be compared to the performance standards to determine the development and ultimate success of the mitigation areas. Species composition in mitigation areas will be compiled from the collected data.

6.5.2 Wildlife Monitoring

Annual bird surveys in the mitigation areas will be conducted in all monitoring years. Wildlife survey will be seasonally targeted during the breeding season (March – July).

6.6 Reporting Requirements

Monitoring reports will be prepared in accordance with King County requirements. All monitoring reports must contain sections for methods, results, analysis, and recommendations. Reports will be tailored to the monitoring year and may include information on the following:

- Plant survival, vigor, and areal vegetation coverage from each mitigation area.
- Color photographs taken from permanent photo points, as shown on the monitoring plan map.
- Condition of habitat features and bird survey results.
- Map markups for maintenance recommendations.

6.7 Contingency Plan

If there is a significant problem with the mitigation achieving its performance standards, King County will develop a contingency plan. Contingency plans can include, but are not limited to, soil decompaction, soil amendments, additional plant installation, and plant substitutions of type, size, quantity, and location. Contingency plans must be submitted to King County by December 31 of any year when deficiencies are discovered.

6.8 Adaptive Management Plan

Following construction of the wetland and stream mitigation, oversight will be required to ensure the long-term success of the restoration and mitigation projects. The goal of the proposed restoration and mitigation is to restore functional, self-sustaining systems that require little or no long-term maintenance. Mitigation sites are dynamic systems that can evolve rapidly as site conditions change. Projects that require modification to soils, plant communities, and topography do not always respond as predicted; therefore, the principles of adaptive management will be used to guide post-construction aquatic area buffer management activities.

Adaptive management is driven by the monitoring objectives that describe the desired condition of a site. If the monitoring objectives are not met, adaptive management activities will be planned to achieve the desired condition. Management activities may include implementation of the contingency actions described above or other activities, as appropriate.

6.9 Maintenance Plan

During Year 1 monitoring, every failed planting must be replaced. Other maintenance activities, such as weeding, trash removal, and structural maintenance, must be done twice per year for the duration of the monitoring period. Some conditions on maintenance include the following:

- Trees and shrubs must be weeded to the dripline, and mulch must be maintained at a 3-inch depth.
- Weed herbaceous plantings, as necessary.
- All litter and invasive vegetation, including but not limited to Himalayan blackberry, reed canary grass, evergreen blackberry, English ivy, morning glory, and Japanese knotweed, must be removed and properly disposed of off site.
- Damaged or missing structural components, such as fences, signs, and posts, and habitat features, such as downed logs and brush piles, must be repaired or replaced.
- The potential use of herbicides for weed control must receive prior approval from the project biologist and be applied by a Washington State-licensed pesticide applicator.

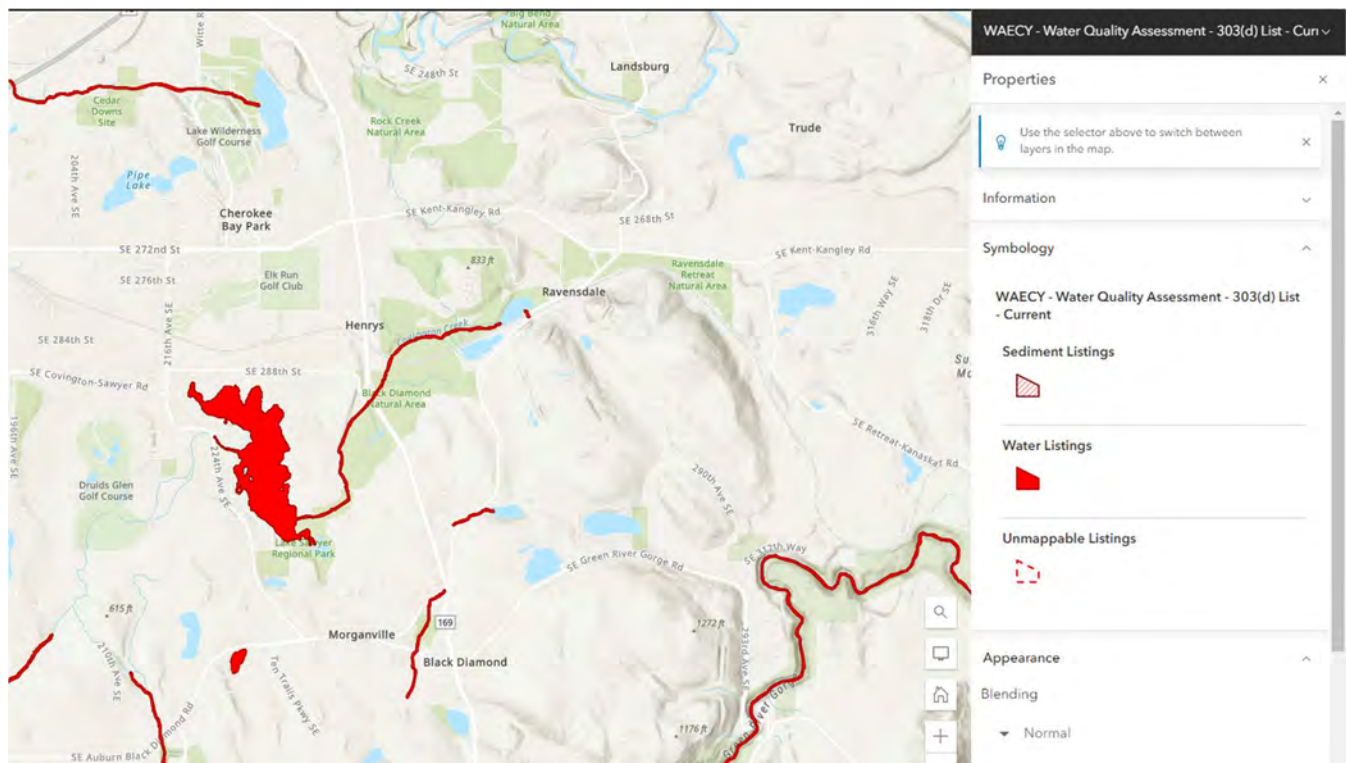
7. REFERENCES

- ACIS (Applied Climate Information System). 2023. Climate Data for King County, Washington. Seattle Sand Boeing Field Station. Available at: <http://agacis.rcc-acis.org/?fips=53061>.
- Anderson, P. S., S. Meyer, P. Olson, and E. Stockdale. 2016. Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State. Washington State Department of Ecology Publication No. 16-06-029. Olympia, WA.
- Brinson, M.M. 1993. A hydrogeomorphic classification for wetlands, Technical Report WRP-DE-4, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
- Corps (U.S. Army Corps of Engineers). 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, MS.
- Corps. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. U.S. Army Corps of Engineers Engineer Research and Development Center, Vicksburg, MS.
- Cowardin, L.M., W. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetland and deepwater habitats of the United States. U.S. Fish and Wildlife Service, Office of Biological Service. Washington, D.C. FWS/OBS-79/31.
- Ecology (Washington State Department of Ecology). 2023. Washington State Water Quality Atlas. Available at: <https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx?>. Accessed February 2023.
- FGDC (Federal Geographic Data Committee). 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.
- Hitchcock, C. Leo, and A. Cronquist. 2018. Flora of the Pacific Northwest. University of Washington Press, Seattle, WA.
- Hruby, T. 2014. Washington State Wetland Rating System for Western Washington: 2014 Update. Washington State Department of Ecology Publication No. 14-06-029. Olympia, WA.
- King County. 2010. Map 14-1 Lahar Inundation Zone. King County Flood Control District. King County, WA. Available at: <https://your.kingcounty.gov/dnrp/library/water-and-land/flooding/local-hazard-mitigation-plan-update/lahar-hazard-map.pdf>.
- King County. 2012. Critical Aquifer Recharge Areas. King County, Washington. Available at: https://kingcounty.gov/~media/depts/permitting-environmental-review/dper/documents/growth-management/comprehensive-plan-2012/executive-recommendations/CARA_mapPDF.ashx?la=en.
- King County. 2020. King County Comprehensive Plan, Updated July 24, 2020. Office of Performance Strategy and Budget. King County, WA. Available at: <https://kingcounty.gov/~media/depts/executive/performance-strategy-budget/regional-planning/2020-Comprehensive-Plan-Update/2016-KCCP-KingCountyComprehensivePlan-updated072420-by-19146.ashx?la=en>.
- King County. 2023. iMap interactive mapping tool. Available at: <http://www.kingcounty.gov/services/gis/Maps/imap.aspx>. Accessed July 2022.

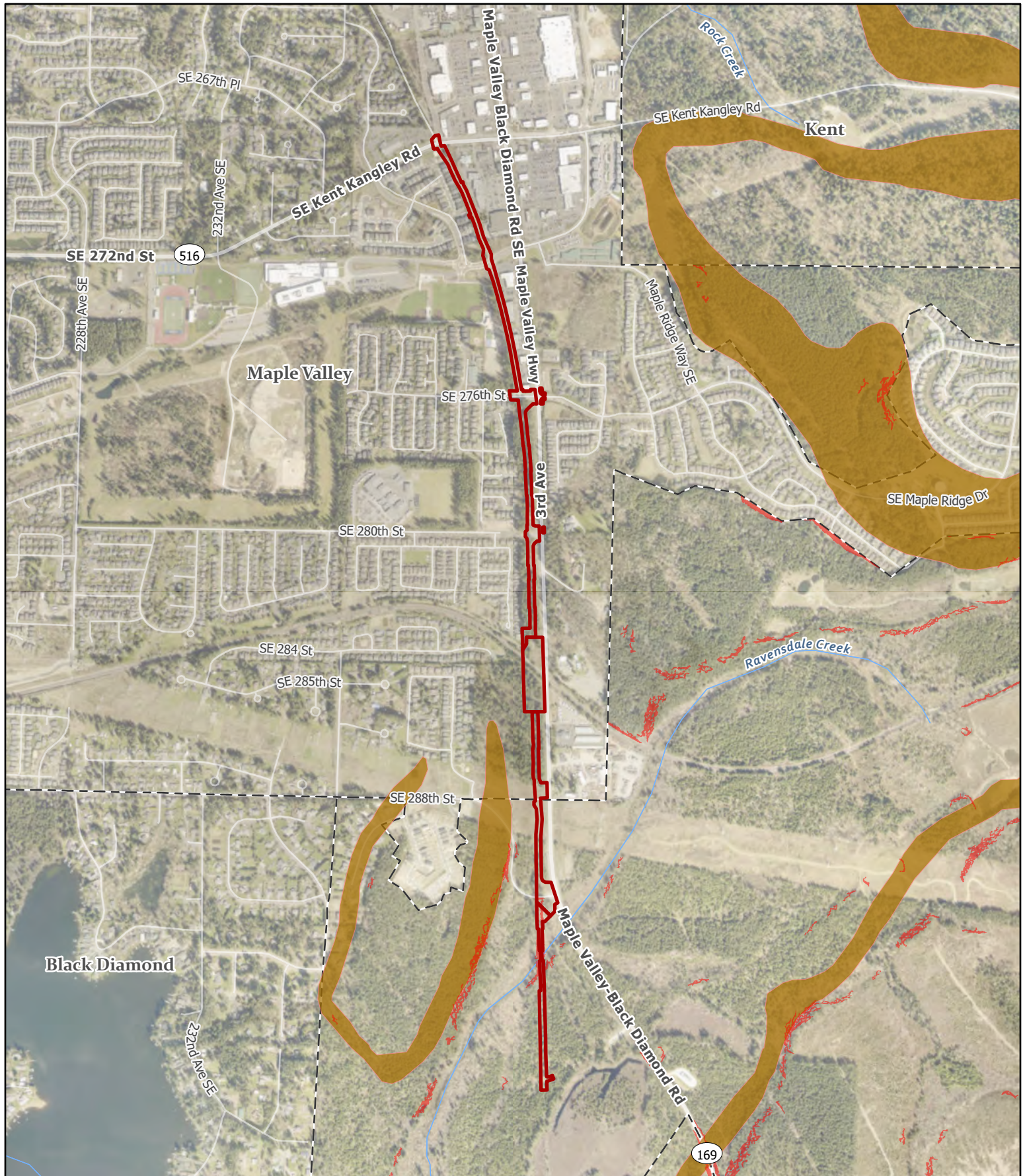
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2020. The National Wetland Plant List: 2020 wetland ratings. *Phytoneuron* 2020(30):1–17. Published 28 April. ISSN 2153 733X.
- Munsell Color. 2015. Munsell soil color charts with genuine Munsell color chips. Grand Rapids, MI.
- NRCS (Natural Resources Conservation Service). 2023. Web soil survey online interactive mapper. U.S. Department of Agriculture. Available at: <https://websoilsurvey.nrcs.usda.gov/app/>.
- NWIFC (Northwest Indian Fisheries Commission). 2023. Statewide Integrated Fish Distribution (SWIFD) Web Map. Available at: <https://geo.nwifc.org/SWIFD/>. Accessed April 2023.
- USFWS (U.S. Fish and Wildlife Service). 2023. National Wetlands Inventory (NWI) online interactive mapper. Available at: <http://www.fws.gov/wetlands/>.
- WDFW (Washington Department of Fish and Wildlife). 2023. PHS on the Web: An interactive map of WDFW priority habitats and species information for project review. Available at: <http://wdfw.wa.gov/mapping/phs/>.
- WDNR (Washington Department of Natural Resources). 2023. WA Wetlands of High Conservation Value Web Map. Available at: <https://www.arcgis.com/apps/mapviewer/index.html?webmap=afd996bb5cf54aa9a7915c905b2f266b>.

Appendix A

Background Information



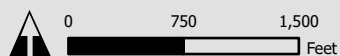
303 D listing showing Ravensdale Creek (Ecology 2023).



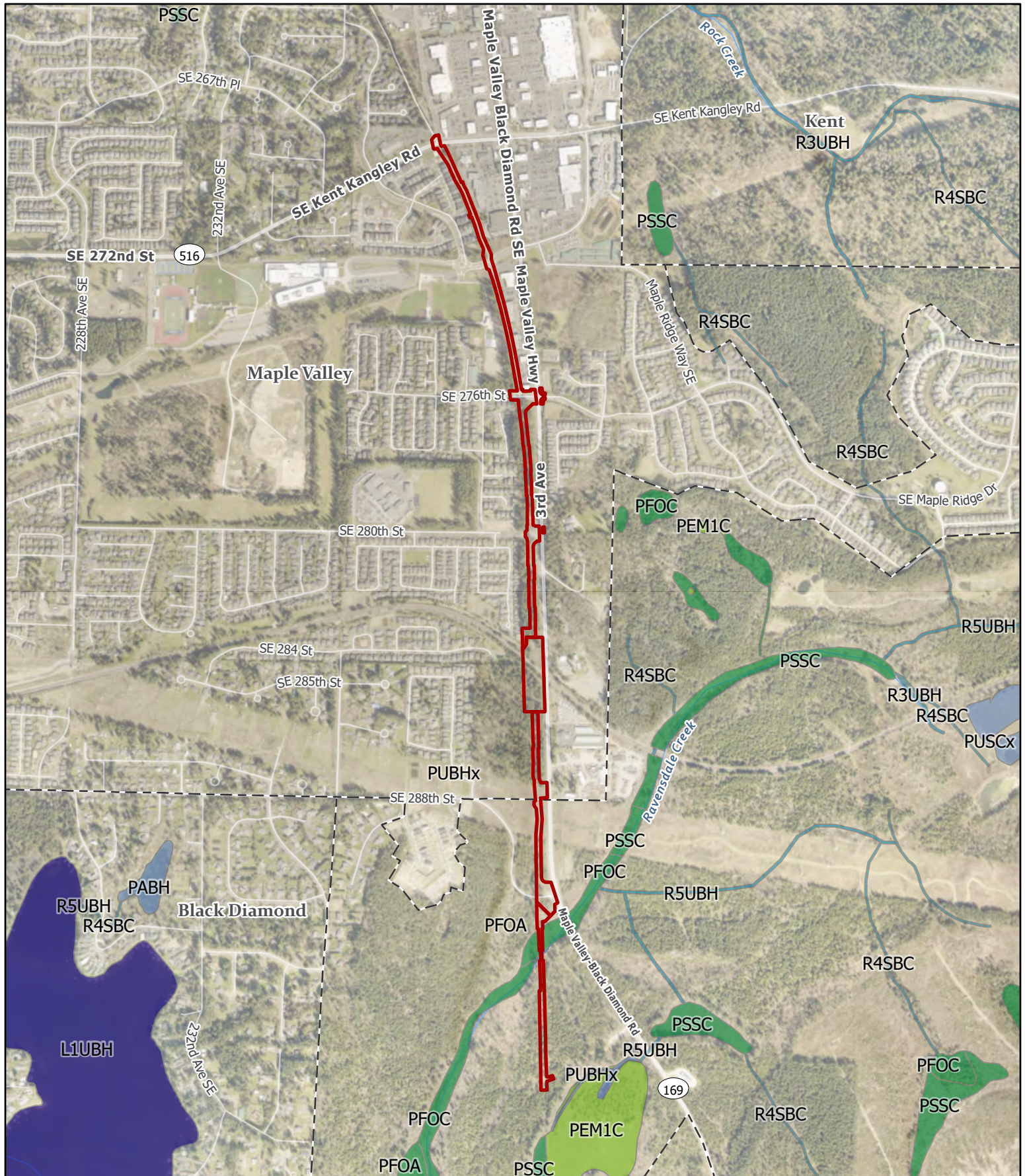
Date: 4/10/2023
 Sources: ESRI, King County, King County Aerial (2021)
 Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

- Potential Steep Slope Hazard Areas
- Erosion Hazard Area
- Project Area

Hazards
 Green to Cedar Rivers Trail



King County, WA



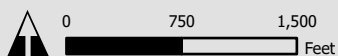
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 Sources: United States Department of Fish & Wildlife Service (USFWS), King County Aerial (2021)
 Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

Project Area

NWI Wetlands

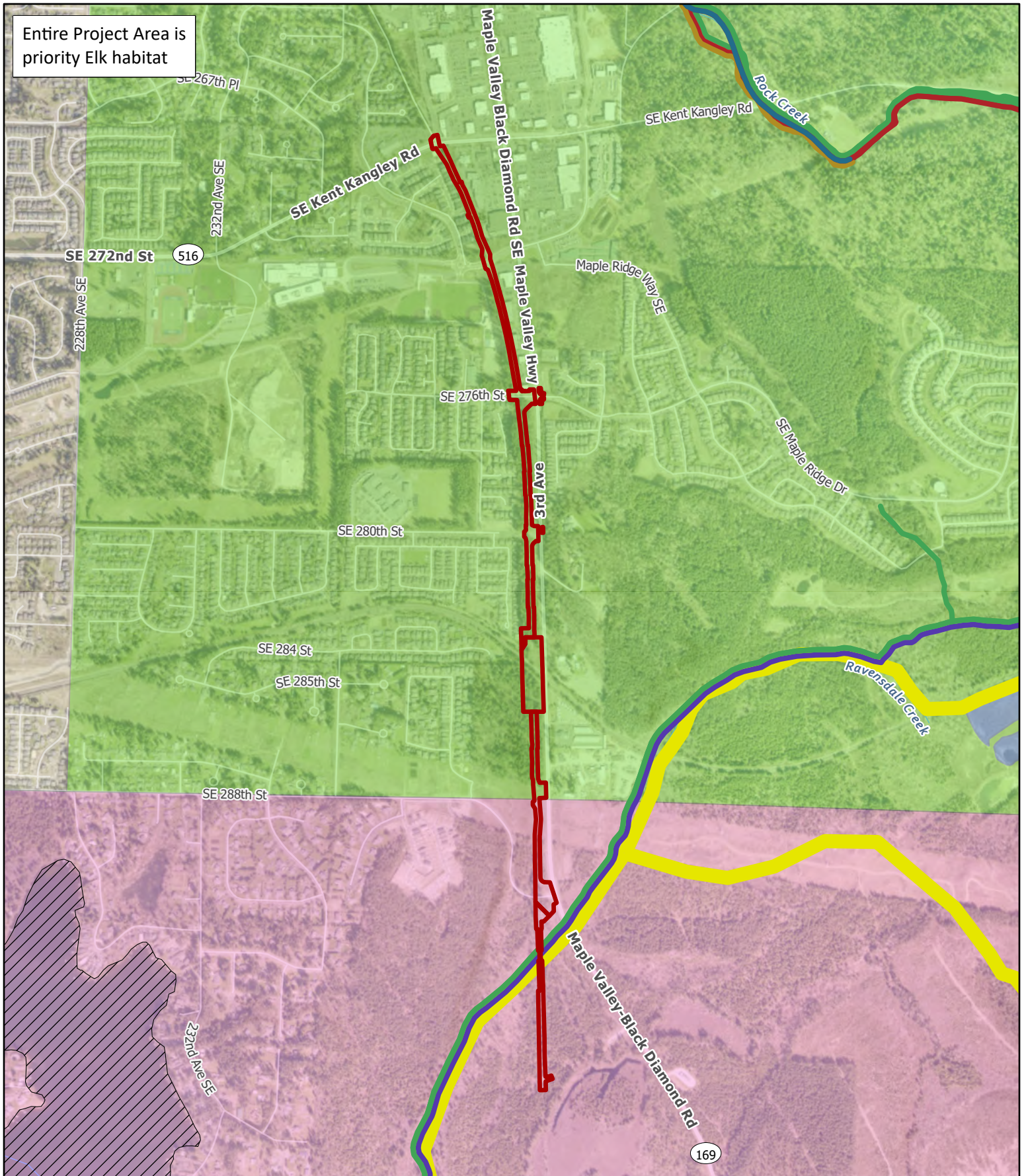
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

NWI Wetlands



King County, WA

Entire Project Area is priority Elk habitat



Date: 4/10/2023
 Sources: King County, Washington Department of Fish & Wildlife (WDFW), King County Aerial (2021)
 Disclaimer: This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes.

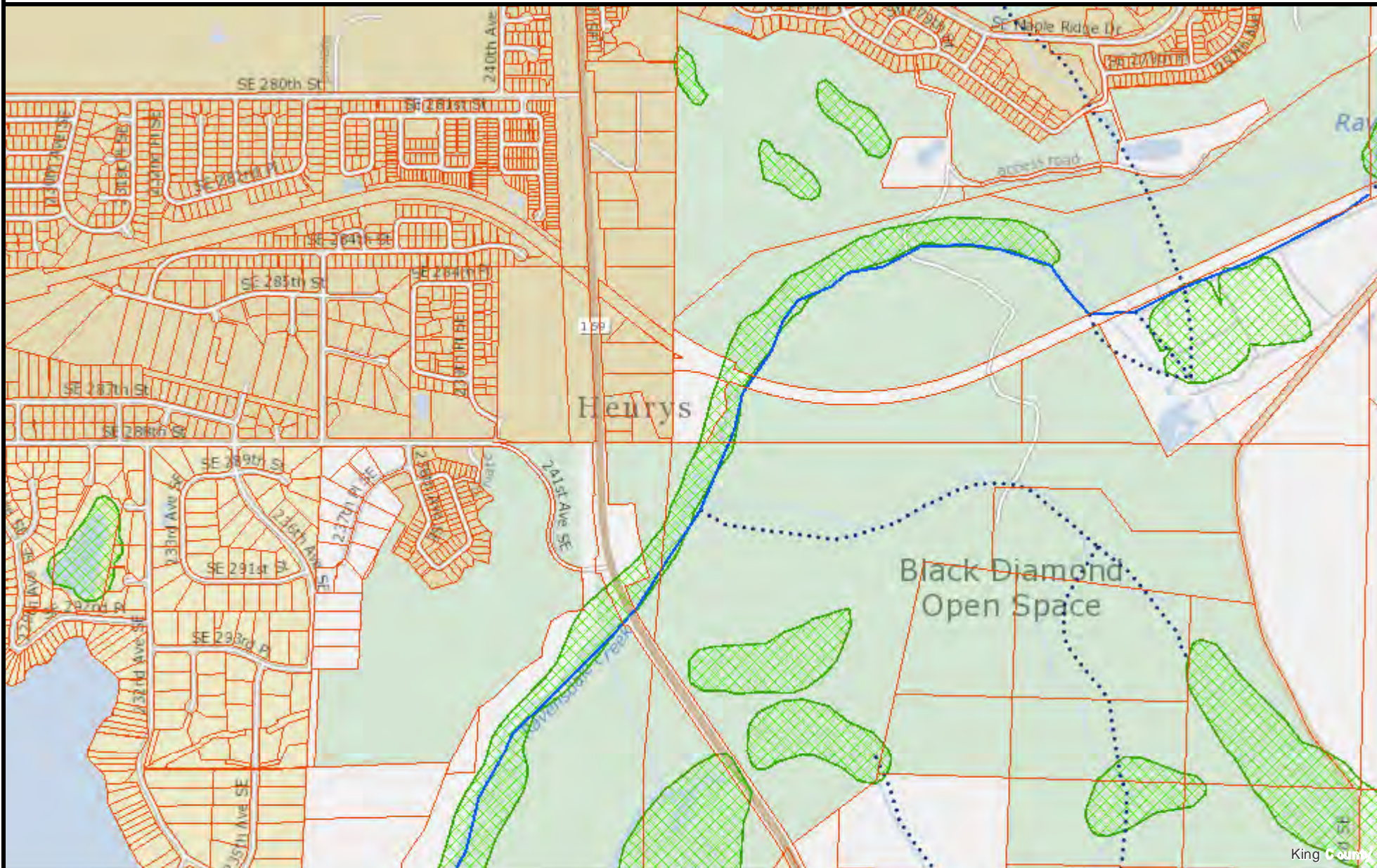
- | | | |
|---|---|---|
| Wildlife Network | Priority Habitats | Winter Steelhead |
| Project Area | Coho | Caves Or Cave-rich Areas |
| | Resident Coastal Cutthroat | Freshwater Pond |
| | Sockeye | Western Pond Turtle |
| | Steelhead | Waterfowl Concentrations |

Wildlife
 Green to Cedar
 Rivers Trail



King County, WA

King County iMap



The information included on this map has been compiled by King County staff from a variety of sources and is subject to change without notice. King County makes no representations or warranties, express or implied, as to accuracy, completeness, timeliness, or rights to the use of such information. This document is not intended for use as a survey product. King County shall not be liable for any general, special, indirect, incidental, or consequential damages including, but not limited to, lost revenues or lost profits resulting from the use or misuse of the information contained on this map. Any sale of this map or information on this map is prohibited except by written permission of King County.

Date: 4/6/2023

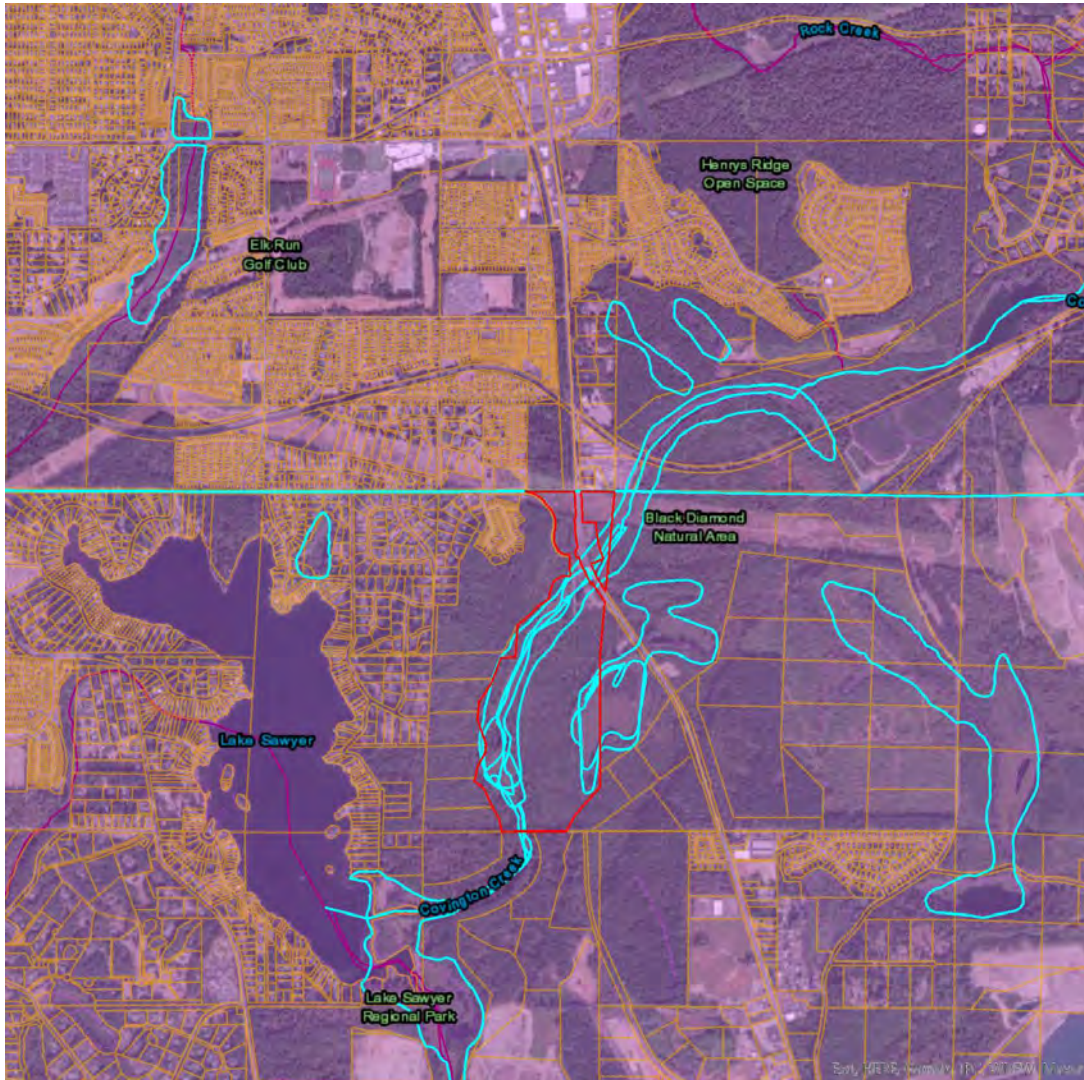
Notes:



King County



Priority Habitats and Species on the Web



Report Date: 04/06/2023, Parcel ID: [0321069001](#)

PHS Species/Habitats Overview:

Occurrence Name	Federal Status	State Status	Sensitive Location
Coho	N/A	N/A	No
Coho	Candidate	N/A	No
Resident Coastal Cutthroat	N/A	N/A	No
Elk	N/A	N/A	No
Wetlands	N/A	N/A	No
Freshwater Emergent Wetland	N/A	N/A	No
Freshwater Forested/Shrub Wetland	N/A	N/A	No
Caves Or Cave-rich Areas	N/A	N/A	Yes

PHS Species/Habitats Details:

Coho	
Scientific Name	<i>Oncorhynchus kisutch</i>
Priority Area	Breeding Area
Site Name	Ravensdale Creek
Accuracy	NA
Notes	LLID: 1220323473264, Fish Name: Coho Salmon, Run Time: Unknown or not Applicable, Life History: Anadromous
Source Record	27021
Source Dataset	SWIFD
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
More Info	http://wdfw.wa.gov/wlm/diversty/soc/soc.htm
Geometry Type	Lines

Coho	
Scientific Name	<i>Oncorhynchus kisutch</i>
Priority Area	Occurrence
Site Name	Ravensdale Creek
Accuracy	NA
Notes	LLID: 1220323473264, Stock Name: Green River/Soos Creek Coho, Run: Unspecified, Status: Healthy
Source Record	3140
Source Dataset	SASI
Source Name	Not Given
Source Entity	WDFW Fish Program
Federal Status	Candidate
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
More Info	http://wdfw.wa.gov/wlm/diversty/soc/soc.htm
Geometry Type	Lines

Resident Coastal Cutthroat	
Scientific Name	<i>Oncorhynchus clarki</i>
Priority Area	Occurrence/Migration
Site Name	Ravensdale Creek
Accuracy	NA
Notes	LLID: 1220323473264, Fish Name: Cutthroat Trout, Run Time: Unknown or not Applicable, Life History: Unknown
Source Record	27017
Source Dataset	SWIFD
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
More Info	http://wdfw.wa.gov/wlm/diversty/soc/soc.htm
Geometry Type	Lines

Elk	
Scientific Name	<i>Cervus elaphus</i>
Priority Area	Regular Concentration
Site Name	GREEN/CEDAR RIVER
Accuracy	General locality
Notes	GREEN/CEDAR RIVER WINTER ELK RANGE.KING COUNTY ELK HABITAT INCLUDES RESIDENT AND WINTER MIGRATORY ELK.
Source Record	918540
Source Dataset	PHSREGION
Source Name	SPENSER, ROCKY WDFW
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS LISTED OCCURRENCE
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://wdfw.wa.gov/publications/pub.php?id=00614
Geometry Type	Polygons

Wetlands	
Priority Area	Aquatic Habitat
Site Name	SOOS CREEK WETLANDS
Accuracy	1/4 mile (Quarter Section)
Notes	VARIOUS WETLANDS IN THE SOOS CREEK DRAINAGE BASIN. MANY OF THESE ALSO HAVE AN OPEN WATER COMPONENT.
Source Record	902538
Source Dataset	PHSREGION
Source Name	MULLER, TED
Source Entity	WA Dept. of Fish and Wildlife
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Emergent Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Emergent Wetland - NWI Code: PEM1C
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOA
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOA
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOA
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOA
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOC
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PFOC
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSSC
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

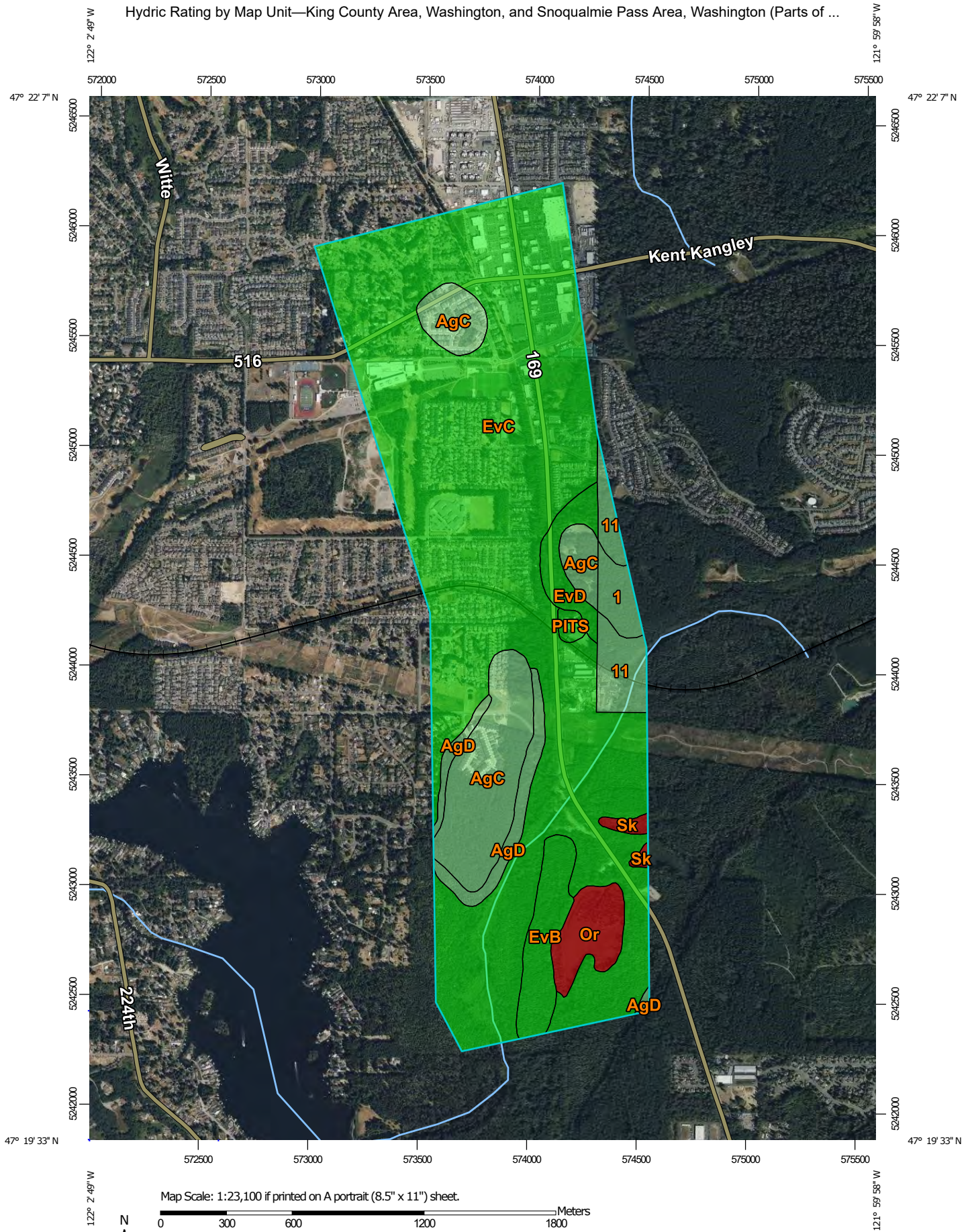
Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSSC
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Freshwater Forested/Shrub Wetland	
Priority Area	Aquatic Habitat
Site Name	N/A
Accuracy	NA
Notes	Wetland System: Freshwater Forested/Shrub Wetland - NWI Code: PSSC
Source Dataset	NWIWetlands
Source Name	Not Given
Source Entity	US Fish and Wildlife Service
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	N
SGCN	N
Display Resolution	AS MAPPED
ManagementRecommendations	http://www.ecy.wa.gov/programs/sea/wetlands/bas/index.html
Geometry Type	Polygons

Caves Or Cave-rich Areas	
Notes	This polygon mask represents one or more records of the above species or habitat occurrence. Contact PHS Data Release at phsproducts@dfw.wa.gov for obtaining information about masked sensitive species and habitats.
Federal Status	N/A
State Status	N/A
PHS Listing Status	PHS Listed Occurrence
Sensitive	Y
SGCN	N
Display Resolution	TOWNSHIP


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

Hydric Rating by Map Unit—King County Area, Washington, and Snoqualmie Pass Area, Washington (Parts of ...









MAP LEGEND

Area of Interest (AOI)







 Area of Interest (AOI)

Soils







Soil Rating Polygons

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available


Soil Rating Lines

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available





Soil Rating Points

-  Hydric (100%)
-  Hydric (66 to 99%)
-  Hydric (33 to 65%)
-  Hydric (1 to 32%)
-  Not Hydric (0%)
-  Not rated or not available

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.

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 18, Sep 8, 2022

Soil Survey Area: Snoqualmie Pass Area, Washington (Parts of King and Pierce Counties)
Survey Area Data: Version 24, Sep 8, 2022

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

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

Date(s) aerial images were photographed: Jul 31, 2022—Sep 8, 2022

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.

Hydric Rating by Map Unit

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	5	101.7	10.9%
AgD	Alderwood gravelly sandy loam, 15 to 30 percent slopes	5	25.4	2.7%
EvB	Everett very gravelly sandy loam, 0 to 8 percent slopes	0	33.5	3.6%
EvC	Everett very gravelly sandy loam, 8 to 15 percent slopes	0	676.8	72.3%
EvD	Everett very gravelly sandy loam, 15 to 30 percent slopes	0	19.4	2.1%
Or	Orcas peat	100	26.9	2.9%
PITS	Pits	0	3.8	0.4%
Sk	Seattle muck	100	4.9	0.5%
Subtotals for Soil Survey Area			892.5	95.4%
Totals for Area of Interest			935.9	100.0%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
1	Alderwood gravelly loam, 0 to 15 percent slopes	10	13.5	1.4%
11	Barneston gravelly ashy coarse sandy loam, 8 to 15 percent slopes	5	30.0	3.2%
Subtotals for Soil Survey Area			43.5	4.6%
Totals for Area of Interest			935.9	100.0%

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Appendix B

Wetland Determination Forms

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

Project/Site: Green to Cedar Trail Seg A City/County: King Sampling Date: 10/27/2023
 Applicant/Owner: KC State: WA Sampling Point: SP-1
 Investigator(s): Wozniak Section, Township, Range: T21NR06ES3
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5-10%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: #N/A Long: #N/A Datum: #N/A
 Soil Unit (Name-ID-Hydric Rating): Everett - #N/A - #N/A NWI classification: near PFO
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u> </u>	No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Hydric Soil Present?	Yes <u> </u>	No <u>X</u>	
Wetland Hydrology Present?	Yes <u> </u>	No <u>X</u>	

Precipitation:

According to the Sand Point NOAA weather station, precipitation was within the normal range for the three months prior to the site visit.

Remarks:

VEGETATION

Tree Stratum	(Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>3</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B)
1.	<u>Acer macrophyllum</u>	<u>20%</u>	<u>Yes</u>	<u>FACU</u>	
2.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
3.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
4.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
		<u>20%</u> = Total Cover			
Sapling/Shrub Stratum	(Plot size: <u>r=2m</u>)				Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> </u> x 1 = <u> </u> FACW species <u> </u> x 2 = <u> </u> FAC species <u> </u> x 3 = <u> </u> FACU species <u> </u> x 4 = <u> </u> UPL species <u> </u> x 5 = <u> </u> Column Totals: <u> </u> (A) <u> </u> (B) Prevalence Index = B/A = <u> </u>
1.	<u>Rubus spectabilis</u>	<u>30%</u>	<u>Yes</u>	<u>FAC</u>	
2.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
3.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
4.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
		<u>30%</u> = Total Cover			
Herb Stratum	(Plot size: <u>r=1m</u>)				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 (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present. Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u>
1.	<u>Polystichum munitum</u>	<u>60%</u>	<u>Yes</u>	<u>FACU</u>	
2.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
3.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
4.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
5.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
6.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
7.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
8.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
9.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
10.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
11.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
		<u>60%</u> = Total Cover			
Woody Vine Stratum	(Plot size: <u>r=2m</u>)				
1.	<u>none</u>	<u> </u>	<u> </u>	<u> </u>	
2.	<u> </u>	<u> </u>	<u> </u>	<u> </u>	
		<u>0%</u> = Total Cover			
% Bare Ground in Herb Stratum <u>0%</u>					

Remarks:

US Army Corps of Engineers
Western Mountains, Valleys, and Coast Region (Version 2.0)

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

Project/Site: Green to Cedar Trail Seg A City/County: King Sampling Date: 10/27/2023
 Applicant/Owner: KC State: WA Sampling Point: SP-2
 Investigator(s): Wozniak Section, Township, Range: T21NR06ES3
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): none Slope (%): <3%
 Subregion (LRR): Northwest Forests and Coast (LRR A) Lat: #N/A Long: #N/A Datum: #N/A
 Soil Unit (Name-ID-Hydric Rating): Everett - #N/A - #N/A NWI classification: PFO
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>	
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>	

Precipitation:
 According to the Sand Point NOAA weather station, precipitation was within the normal range for the three months prior to the site visit.

Remarks:

VEGETATION

Tree Stratum	(Plot size: <u>1=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across All Strata: <u>4</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)
1. <u>Alnus rubra</u>		<u>20%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
		<u>20%</u> = Total Cover			Prevalence Index worksheet: Total % Cover of: <u> </u> Multiply by: <u> </u> OBL species <u> </u> x 1 = <u> </u> FACW species <u> </u> x 2 = <u> </u> FAC species <u> </u> x 3 = <u> </u> FACU species <u> </u> x 4 = <u> </u> UPL species <u> </u> x 5 = <u> </u> Column Totals: <u> </u> (A) <u> </u> (B) Prevalence Index = B/A = <u> </u>
Sapling/Shrub Stratum	(Plot size: <u>1=2m</u>)				Hydrophytic Vegetation Indicators: 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 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 (Explain) ¹ ¹ Indicators of hydric soil and wetland hydrology must be present.
1. <u>Rubus spectabilis</u>		<u>60%</u>	<u>Yes</u>	<u>FAC</u>	
2. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
3. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
		<u>60%</u> = Total Cover			
Herb Stratum	(Plot size: <u>1=1m</u>)				Hydrophytic Vegetation Yes <u>X</u> No <u> </u> Present?
1. <u>Phalaris arundinacea</u>		<u>20%</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Athyrium cyclosorum</u>		<u>20%</u>	<u>Yes</u>	<u>FAC</u>	
3. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
4. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
5. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
6. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
7. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
8. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
9. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
10. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
11. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
		<u>40%</u> = Total Cover			
Woody Vine Stratum	(Plot size: <u>1=2m</u>)				
1. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
2. <u> </u>		<u> </u>	<u> </u>	<u> </u>	
		<u>0%</u> = Total Cover			
% Bare Ground in Herb Stratum <u>0%</u>					

Remarks:

US Army Corps of Engineers
Western Mountains, Valleys, and Coast Region (Version 2.0)

Appendix C

Wetland Rating Forms



Wetland name or number _____

RATING SUMMARY – Western Washington

Name of wetland (or ID #): W1 Date of site visit: 10.27.23
Rated by J. Wozniak Trained by Ecology? ☒ Yes ___ No Date of training 4/20
HGM Class used for rating Riverine Wetland has multiple HGM classes? ___ Y ☒ N

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

Source of base aerial photo/map ERSI

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

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Circle the appropriate ratings				
Site Potential	<input checked="" type="radio"/> H M L	H <input checked="" type="radio"/> M L	H <input checked="" type="radio"/> M L	
Landscape Potential	<input checked="" type="radio"/> H <input checked="" type="radio"/> M L	H <input checked="" type="radio"/> M L	<input checked="" type="radio"/> H M L	
Value	H <input checked="" type="radio"/> M L	H <input checked="" type="radio"/> M L	<input checked="" type="radio"/> H M L	
Score Based on Ratings	<u>8</u>	<u>6</u>	<u>8</u>	<u>22</u>

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	I II
Wetland of High Conservation Value	I
Bog	I
Mature Forest	I
Old Growth Forest	I
Coastal Lagoon	I II
Interdunal	I II III IV
None of the above	<input checked="" type="checkbox"/>

Wetland name or number W1

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

HGM Classification of Wetlands in Western Washington

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

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

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

☒ **NO** – go to 2

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

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

NO – Saltwater Tidal Fringe (Estuarine)

YES – Freshwater Tidal Fringe

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

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

☒ **NO** – go to 3

YES – The wetland class is **Flats**

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

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

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

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

☒ **NO** – go to 4

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

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

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

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

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

☒ **NO** – go to 5

YES – The wetland class is **Slope**

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

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

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

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

Wetland name or number _____

NO – go to 6

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

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

NO – go to 7

YES – The wetland class is **Depressional**

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

NO – go to 8

YES – The wetland class is **Depressional**

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

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

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

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

Wetland name or number

W1

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS**Water Quality Functions** - Indicators that the site functions to improve water quality**R 1.0. Does the site have the potential to improve water quality?**

R 1.1. Area of surface depressions within the Riverine wetland that can trap sediments during a flooding event:		
Depressions cover $> \frac{3}{4}$ area of wetland	points = 8	4
Depressions cover $> \frac{1}{2}$ area of wetland	points = 4	
Depressions present but cover $< \frac{1}{2}$ area of wetland	points = 2	
No depressions present	points = 0	
R 1.2. Structure of plants in the wetland (areas with >90% cover at person height, not Cowardin classes)		
Trees or shrubs $> \frac{2}{3}$ area of the wetland	points = 8	8
Trees or shrubs $> \frac{1}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) $> \frac{2}{3}$ area of the wetland	points = 6	
Herbaceous plants (> 6 in high) $> \frac{1}{3}$ area of the wetland	points = 3	
Trees, shrubs, and ungrazed herbaceous $< \frac{1}{3}$ area of the wetland	points = 0	
Total for R 1	Add the points in the boxes above	12

Rating of Site Potential If score is: X 12-16 = H 6-11 = M 0-5 = L

Record the rating on the first page

R 2.0. Does the landscape have the potential to support the water quality function of the site?

R 2.1. Is the wetland within an incorporated city or within its UGA?	Yes = 2 No = 0	2
R 2.2. Does the contributing basin to the wetland include a UGA or incorporated area?	Yes = 1 No = 0	1
R 2.3. Does at least 10% of the contributing basin contain tilled fields, pastures, or forests that have been clearcut within the last 5 years?	Yes = 1 No = 0	0
R 2.4. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	0
R 2.5. Are there other sources of pollutants coming into the wetland that are not listed in questions R 2.1-R 2.4	Yes = 1 No = 0	0
Other sources _____		
Total for R 2	Add the points in the boxes above	3

Rating of Landscape Potential If score is: X 3-6 = H 1 or 2 = M 0 = L

Record the rating on the first page

R 3.0. Is the water quality improvement provided by the site valuable to society?

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

Rating of Value If score is: 2-4 = H X 1 = M 0 = L

Record the rating on the first page

Wetland name or number W1

RIVERINE AND FRESHWATER TIDAL FRINGE WETLANDS

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

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

R 4.1. Characteristics of the overbank storage the wetland provides:

Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of wetland)/(average width of stream between banks).

If the ratio is more than 20	points = 9
If the ratio is 10-20	points = 6
If the ratio is 5-<10	points = 4
If the ratio is 1-<5	points = 2
If the ratio is < 1	points = 1

4

R 4.2. Characteristics of plants that slow down water velocities during floods: *Treat large woody debris as forest or shrub. Choose the points appropriate for the best description (polygons need to have >90% cover at person height. These are NOT Cowardin classes).*

Forest or shrub for $> \frac{1}{3}$ area OR emergent plants $> \frac{2}{3}$ area	points = 7
Forest or shrub for $> \frac{1}{10}$ area OR emergent plants $> \frac{1}{3}$ area	points = 4
Plants do not meet above criteria	points = 0

7

Total for R 4

Add the points in the boxes above

11

Rating of Site Potential If score is: 12-16 = H X 5-11 = M 0-5 = L

Record the rating on the first page

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

R 5.1. Is the stream or river adjacent to the wetland downcut? Yes = 0 No = 1

0

R 5.2. Does the up-gradient watershed include a UGA or incorporated area? Yes = 1 No = 0

1

R 5.3. Is the up-gradient stream or river controlled by dams? Yes = 0 No = 1

0

Total for R 5

Add the points in the boxes above

1

Rating of Landscape Potential If score is: 3 = H X 1 or 2 = M 0 = L

Record the rating on the first page

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

R 6.1. Distance to the nearest areas downstream that have flooding problems?

Choose the description that best fits the site.

The sub-basin immediately down-gradient of the wetland has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds)	points = 2
Surface flooding problems are in a sub-basin farther down-gradient	points = 1
No flooding problems anywhere downstream	points = 0

1

R 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?

Yes = 2 No = 0

0

Total for R 6

Add the points in the boxes above

1

Rating of Value If score is: 2-4 = H X 1 = M 0 = L

Record the rating on the first page

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

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

2

H 1.2. Hydroperiods

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

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

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft².

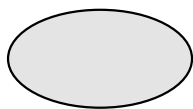
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

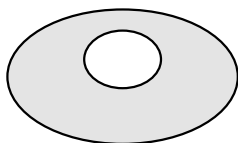
1

H 1.4. Interspersion of habitats

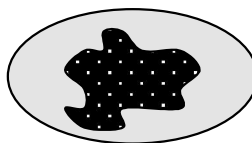
Decide from the diagrams below whether interspersions among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



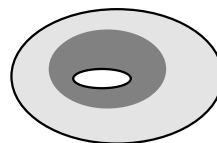
None = 0 points



Low = 1 point

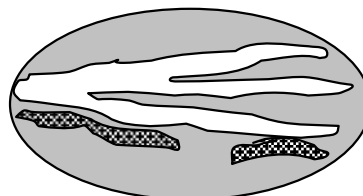
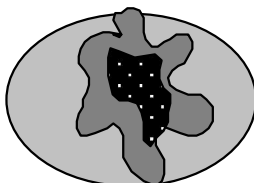
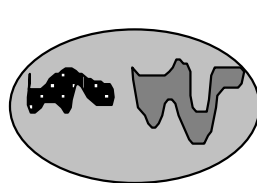


Moderate = 2 points



3

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



Wetland name or number **W1**

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). <input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input checked="" type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) <input checked="" type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>) <input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>) _____ Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">5</div>
Total for H 1 Add the points in the boxes above		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">13</div>

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?		
H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat ____ + [(% moderate and low intensity land uses)/2] ____ = ____ % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">3</div>
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat ____ + [(% moderate and low intensity land uses)/2] ____ = ____ % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">3</div>
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">0</div>
Total for H 2 Add the points in the boxes above		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">6</div>

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

H 3.0. Is the habitat provided by the site valuable to society?		
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i> Site meets ANY of the following criteria: points = 2 <input checked="" type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0		<div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">2</div>
Rating of Value If score is: <input checked="" type="checkbox"/> <u>2 = H</u> <u>1 = M</u> <u>0 = L</u>		<i>Record the rating on the first page</i>

Wetland name or number _____

WDFW Priority Habitats

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

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

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

☒ **Biodiversity Areas and Corridors:** Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

☒ **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

☒ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore:** Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page*).

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

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

☒ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

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

Wetland name or number w1

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <div style="text-align: right;">Yes – Go to SC 1.1 No – Not an estuarine wetland</div>	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? <div style="text-align: right;">Yes = Category I No - Go to SC 1.2</div>	Cat. I
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <div style="text-align: right;">Yes = Category I No = Category II</div>	Cat. I Cat. II
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? <div style="text-align: right;">Yes – Go to SC 2.2 Yes – Go to SC 2.3 Yes = Category I No – Not a WHCV</div> SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf <div style="text-align: right;">Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV</div> SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? <div style="text-align: right;">Yes = Category I No = Not a WHCV</div>	Cat. I
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i> SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? <div style="text-align: right;">Yes – Go to SC 3.3 No – Go to SC 3.2</div> SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? <div style="text-align: right;">Yes – Go to SC 3.3 No – Is not a bog</div> SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? <div style="text-align: right;">Yes = Is a Category I bog No – Go to SC 3.4</div> NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? <div style="text-align: right;">Yes = Is a Category I bog No = Is not a bog</div>	Cat. I

Wetland name or number w1

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <ul style="list-style-type: none"> — Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). <p>Yes = Category I No = Not a forested wetland for this section</p>	<p>Cat. I</p>
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>) <p>Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland is larger than 1/10 ac (4350 ft²) <p>Yes = Category I No = Category II</p>	<p>Cat. I</p> <p>Cat. II</p>
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 <p>Yes – Go to SC 6.1 No = not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = Category I No – Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = Category II No – Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV</p>	<p>Cat I</p> <p>Cat. II</p> <p>Cat. III</p> <p>Cat. IV</p>
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	

Wetland name or number W2

RATING SUMMARY – Western Washington

Name of wetland (or ID #): W2 Date of site visit: 10.27.23
Rated by J. Wozniak Trained by Ecology? ☒ Yes ___ No Date of training 4/20
HGM Class used for rating depressional Wetland has multiple HGM classes? ___ Y ☒ N

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

Source of base aerial photo/map ESRI

OVERALL WETLAND CATEGORY I (based on functions ___ or special characteristics ☒)

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
Circle the appropriate ratings				
Site Potential	H M L	H M L	H M L	
Landscape Potential	H M L	H M L	H M L	
Value	H M L	H M L	H M L	TOTAL
Score Based on Ratings				

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

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

HGM Classification of Wetlands in Western Washington

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

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

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

☒ NO – go to 2

☐ YES – the wetland class is **Tidal Fringe** – go to 1.1

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

☒ NO – **Saltwater Tidal Fringe (Estuarine)**

☐ YES – **Freshwater Tidal Fringe**

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

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

☒ NO – go to 3

☐ YES – The wetland class is **Flats**

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

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

- ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
☐ At least 30% of the open water area is deeper than 6.6 ft (2 m).

☒ NO – go to 4

☐ YES – The wetland class is **Lake Fringe** (Lacustrine Fringe)

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

- ☐ The wetland is on a slope (*slope can be very gradual*),
☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
☐ The water leaves the wetland **without being impounded**.

☒ NO – go to 5

☐ YES – The wetland class is **Slope**

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

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

- ☐ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
☐ The overbank flooding occurs at least once every 2 years.

Wetland name or number _____

NO – go to 6

YES – The wetland class is **Riverine**

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

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

NO – go to 7

YES – The wetland class is **Depressional**

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

NO – go to 8

YES – The wetland class is **Depressional**

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

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

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

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

Wetland name or number W2

DEPRESSIONAL AND FLATS WETLANDS	
Water Quality Functions - Indicators that the site functions to improve water quality	
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland is a depression or flat depression (QUESTION 7 on key) with no surface water leaving it (no outlet). points = 3 Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet. points = 2 Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing points = 1 Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch. points = 1	2
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic (use NRCS definitions). Yes = 4 No = 0	
D 1.3. Characteristics and distribution of persistent plants (Emergent, Scrub-shrub, and/or Forested Cowardin classes): Wetland has persistent, ungrazed, plants > 95% of area points = 5 Wetland has persistent, ungrazed, plants > ½ of area points = 3 Wetland has persistent, ungrazed plants > 1/10 of area points = 1 Wetland has persistent, ungrazed plants < 1/10 of area points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: <i>This is the area that is ponded for at least 2 months. See description in manual.</i> Area seasonally ponded is > ½ total area of wetland points = 4 Area seasonally ponded is > ¼ total area of wetland points = 2 Area seasonally ponded is < ¼ total area of wetland points = 0	0
Total for D 1	7

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

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

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

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

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

Wetland name or number W2

DEPRESSIONAL AND FLATS WETLANDS

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

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

D 4.1. Characteristics of surface water outflows from the wetland:

- | | | |
|---|------------|---|
| Wetland is a depression or flat depression with no surface water leaving it (no outlet) | points = 4 | |
| Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet | points = 2 | |
| Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch | points = 1 | 2 |
| Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing | points = 0 | |

D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.*

- | | | |
|--|------------|---|
| Marks of ponding are 3 ft or more above the surface or bottom of outlet | points = 7 | |
| Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet | points = 5 | |
| Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet | points = 3 | 3 |
| The wetland is a "headwater" wetland | points = 3 | |
| Wetland is flat but has small depressions on the surface that trap water | points = 1 | |
| Marks of ponding less than 0.5 ft (6 in) | points = 0 | |

D 4.3. Contribution of the wetland to storage in the watershed: *Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.*

- | | | |
|---|------------|---|
| The area of the basin is less than 10 times the area of the unit | points = 5 | |
| The area of the basin is 10 to 100 times the area of the unit | points = 3 | 3 |
| The area of the basin is more than 100 times the area of the unit | points = 0 | |
| Entire wetland is in the Flats class | points = 5 | |

Total for D 4

Add the points in the boxes above

10

Rating of Site Potential If score is: 12-16 = H X 6-11 = M 0-5 = L

Record the rating on the first page

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

D 5.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0

0

D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff? Yes = 1 No = 0

0

D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)? Yes = 1 No = 0

0

Total for D 5

Add the points in the boxes above

0

Rating of Landscape Potential If score is: 3 = H 1 or 2 = M X 0 = L

Record the rating on the first page

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

D 6.1. The unit is in a landscape that has flooding problems. *Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.*

- | | | |
|--|------------|---|
| The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds): | | |
| • Flooding occurs in a sub-basin that is immediately down-gradient of unit. | points = 2 | 1 |
| • Surface flooding problems are in a sub-basin farther down-gradient. | points = 1 | |
| Flooding from groundwater is an issue in the sub-basin. | points = 1 | |
| The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. <i>Explain why</i> _____ | points = 0 | |
| There are no problems with flooding downstream of the wetland. | points = 0 | |

D 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?

Yes = 2 No = 0

0

Total for D 6

Add the points in the boxes above

1

Rating of Value If score is: 2-4 = H X 1 = M 0 = L

Record the rating on the first page

These questions apply to wetlands of all HGM classes.**HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat**H 1.0. Does the site have the potential to provide habitat?**

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

- | | |
|--|----------------------------------|
| <input type="checkbox"/> Aquatic bed | 4 structures or more: points = 4 |
| <input type="checkbox"/> Emergent | 3 structures: points = 2 |
| <input checked="" type="checkbox"/> Scrub-shrub (areas where shrubs have > 30% cover) | 2 structures: points = 1 |
| <input checked="" type="checkbox"/> Forested (areas where trees have > 30% cover) | 1 structure: points = 0 |
| <i>If the unit has a Forested class, check if:</i> | |
| <input checked="" type="checkbox"/> 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 | |

2

H 1.2. Hydroperiods

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

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

2

H 1.3. Richness of plant species

Count the number of plant species in the wetland that cover at least 10 ft².

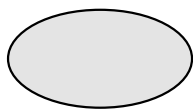
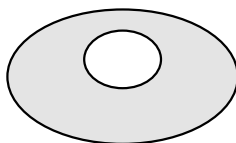
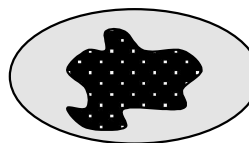
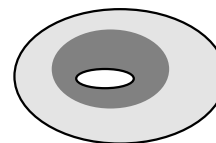
*Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. **Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle***

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

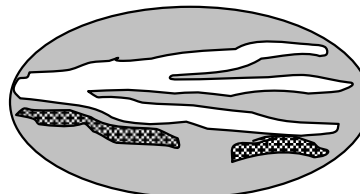
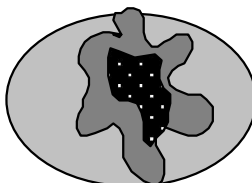
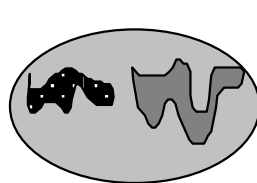
1

H 1.4. Interspersion of habitats

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

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

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



3

Wetland name or number W2

<p>H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).</p> <p><input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland</p> <p><input checked="" type="checkbox"/> Undercut banks are present for at least 6.6 ft (2 m) and/or overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m)</p> <p><input checked="" type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present (<i>cut shrubs or trees that have not yet weathered where wood is exposed</i>)</p> <p><input checked="" type="checkbox"/> At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated (<i>structures for egg-laying by amphibians</i>)</p> <p><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p>	<div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">5</div>
<p>Total for H 1</p>	<p>Add the points in the boxes above</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">13</div>

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

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p><i>Calculate:</i> % undisturbed habitat ____ + [(% moderate and low intensity land uses)/2] ____ = ____ %</p> <p>If total accessible habitat is:</p> <p>> 1/3 (33.3%) of 1 km Polygon points = 3</p> <p>20-33% of 1 km Polygon points = 2</p> <p>10-19% of 1 km Polygon points = 1</p> <p>< 10% of 1 km Polygon points = 0</p>	<div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">3</div>
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p><i>Calculate:</i> % undisturbed habitat ____ + [(% moderate and low intensity land uses)/2] ____ = ____ %</p> <p>Undisturbed habitat > 50% of Polygon points = 3</p> <p>Undisturbed habitat 10-50% and in 1-3 patches points = 2</p> <p>Undisturbed habitat 10-50% and > 3 patches points = 1</p> <p>Undisturbed habitat < 10% of 1 km Polygon points = 0</p>	<div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">3</div>
<p>H 2.3. Land use intensity in 1 km Polygon: If</p> <p>> 50% of 1 km Polygon is high intensity land use points = (- 2)</p> <p>≤ 50% of 1 km Polygon is high intensity points = 0</p>	<div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">0</div>
<p>Total for H 2</p>	<p>Add the points in the boxes above</p> <div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">6</div>

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

H 3.0. Is the habitat provided by the site valuable to society?	
<p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i></p> <p>Site meets ANY of the following criteria: points = 2</p> <p><input checked="" type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page)</p> <p>— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)</p> <p>— It is mapped as a location for an individual WDFW priority species</p> <p>— It is a Wetland of High Conservation Value as determined by the Department of Natural Resources</p> <p>— It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan</p> <p>Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1</p> <p>Site does not meet any of the criteria above points = 0</p>	<div style="border: 1px solid black; width: 30px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">2</div>

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

WDFW Priority Habitats

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

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

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

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

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt	
Yes – Go to SC 1.1 No = Not an estuarine wetland	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?	Cat. I
Yes = Category I No - Go to SC 1.2	
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are <i>Spartina</i> , see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	Cat. I Cat. II
Yes = Category I No = Category II	
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?	Cat. I
Yes – Go to SC 2.2 No – Go to SC 2.3	
SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?	
Yes = Category I No = Not a WHCV	
SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf	
Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV	
SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?	
Yes = Category I No = Not a WHCV	
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? <i>Use the key below. If you answer YES you will still need to rate the wetland based on its functions.</i>	
SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?	
Yes – Go to SC 3.3 No – Go to SC 3.2	
SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?	
Yes – Go to SC 3.3 No = Is not a bog	
SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?	
Yes = Is a Category I bog No – Go to SC 3.4	
NOTE: If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog.	Cat. I
SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?	
Yes = Is a Category I bog No = Is not a bog	

Wetland name or number W2

<p>SC 4.0. Forested Wetlands</p> <p>Does the wetland have at least <u>1 contiguous acre</u> of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? <i>If you answer YES you will still need to rate the wetland based on its functions.</i></p> <ul style="list-style-type: none"> — Old-growth forests (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — Mature forests (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). <p style="text-align: right;">Yes = Category I No = Not a forested wetland for this section</p>	Cat. I
<p>SC 5.0. Wetlands in Coastal Lagoons</p> <p>Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <ul style="list-style-type: none"> — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon (<i>needs to be measured near the bottom</i>) <p style="text-align: right;">Yes – Go to SC 5.1 No = Not a wetland in a coastal lagoon</p> <p>SC 5.1. Does the wetland meet all of the following three conditions?</p> <ul style="list-style-type: none"> — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland is larger than 1/10 ac (4350 ft²) <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 6.0. Interdunal Wetlands</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? <i>If you answer yes you will still need to rate the wetland based on its habitat functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 <p style="text-align: right;">Yes – Go to SC 6.1 No = not an interdunal wetland for rating</p> <p>SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = Category I No – Go to SC 6.2</p> <p>SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = Category II No – Go to SC 6.3</p> <p>SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = Category III No = Category IV</p>	Cat I Cat. II Cat. III Cat. IV
<p>Category of wetland based on Special Characteristics</p> <p>If you answered No for all types, enter "Not Applicable" on Summary Form</p>	<div style="border: 1px solid black; width: 30px; height: 20px; margin: 0 auto;"></div>

Appendix D

Photographs



Photo 1. Southern end of project area, facing south. Young upland conifer forest dominates this area.



Photo 2. Southern end of project area, south of Ravensdale Creek, facing north. Young upland conifer forest dominates this area.



Photo 3. View of south approach to new bridge over Ravensdale Creek, facing north. This area was part of a large fish passage improvement project with extensive temporary disturbances. The proposed trail project will have no additional impacts in this area.



Photo 4. View from new bridge over Ravensdale Creek, facing east (upstream). SR 169 bridge is in the background. Ravensdale Creek and Wetland W1 are in foreground. The unnamed stream flows into Ravensdale Creek and Wetland W1 in the right foreground, near the leaning red alder trees.



Photo 5. View from north abutment of new bridge over Ravensdale Creek, facing down and south towards the newly restored channel and placed logs.



Photo 6. View from new bridge over Ravensdale Creek, facing east (downstream). The temporary construction limits (orange fence) for the bridge project and newly reconstructed channel in the foreground. Ravensdale Creek and Wetland W1 are in background.



Photo 7. View approaching SE 288th street crossing facing north. Young upland deciduous forest and brush dominate this area.



Photo 8. View of existing trail north of SE 280th Street, facing north. Upland coniferous forest dominates this area.



Photo 9. View of existing trail north of SE 280th Street, facing south. Upland coniferous forest dominates this area.



Photo 10. View of existing trail in power easement, facing north. Upland non-native brush dominates this area.



Photo 11. View of existing trail south of SE 280th Street, facing south. Upland coniferous forest dominates this area.



Photo 12. View of existing trail interface with railroad line, facing east. Upland coniferous forest dominates this area.



Photo 13. Developed upland conditions at the north end of the project area. Facing north.



Photo 14. Developed upland conditions at the north end of the project area. Facing south.

Appendix E

Project Plans

