

Willows Road Culvert Replacement: Critical Areas Report

Prepared for
City of Redmond



August 2018

Prepared by
Parametrix

Willows Road Culvert Replacement: Critical Areas Report

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CITATION

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ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
BMPs	best management practices
City	City of Redmond
CMP	corrugated metal pipe
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
FEMA	Federal Emergency Management Agency
FIRMs	Flood Insurance Rate Maps
FWHCA	Fish and Wildlife Habitat Conservation Area
HGM	hydrogeomorphic
HPA	Hydraulic Project Approval
NRCS	Natural Resources Conservation Service
OHWM	ordinary high water mark
PHS	Priority Habitats and Species
RZC	City of Redmond Zoning Code
Sea-Tac Airport	Seattle-Tacoma International Airport
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

1. INTRODUCTION

This Critical Areas Report supports environmental review of the Willows Road Culvert Replacement project. The project area is located from NE 90th Street to NE 124th Street in Redmond, Washington. This report summarizes critical areas that occur in the project area, with detailed information about wetlands and Fish and Wildlife Habitat Conservation Areas (FWHCAs), including streams. The report appendices include detailed information regarding geotechnical conditions and mapping of other critical areas (aquifer recharge and frequently flooded areas). This report also describes regulatory implications, project-related impacts, measures for avoiding or minimizing potential adverse effects, and a conceptual mitigation approach. Appendices A through F provide supplementary project information.

1.1 Project Description

The City of Redmond (City) intends to rehabilitate the pavement surface on Willows Road between NE 90th Street and NE 124th Street. The existing road section will be repaved and ramps compliant with the Americans with Disabilities Act (ADA) will be upgraded. In addition, the project will replace two culverts that span Willows Road, one at Willows Creek and one at Gun Club Creek. The new culverts will generally be in the same footprint as the culverts being removed, but additional width will be provided to improve fish passage.

At Willows Creek, the existing 43 by 27-inch-corrugated metal pipe (CMP) arch culvert will be replaced with a 12-foot-wide by 5-foot-high three-sided box culvert. Strip footings on each side of the culvert will be 2 feet by 2 feet and the culvert will be stabilized in place with seven 4-inch-diameter pin piles on each side of the culvert, for a total of 14 pin piles. The piles will extend 25 feet beneath the existing ground surface. At Gun Club Creek, the existing 36 by 22-inch-CMP arch culvert will be replaced with a 10-foot-wide by 4-foot-high four-sided box culvert. The culvert will be placed on an 18-inch-deep rock pad foundation. An existing water line will be expanded to 1 foot in diameter and lowered to a depth of 7 to 8 feet below surface parallel to Willows Road.

The culvert replacements will be accomplished with equipment such as a pile driver, crane, excavator, dump truck, concrete truck, light service vehicles, and various hand tools. A nearby parking lot will be used for material storage and equipment staging. Access to the project site will be via existing roads.

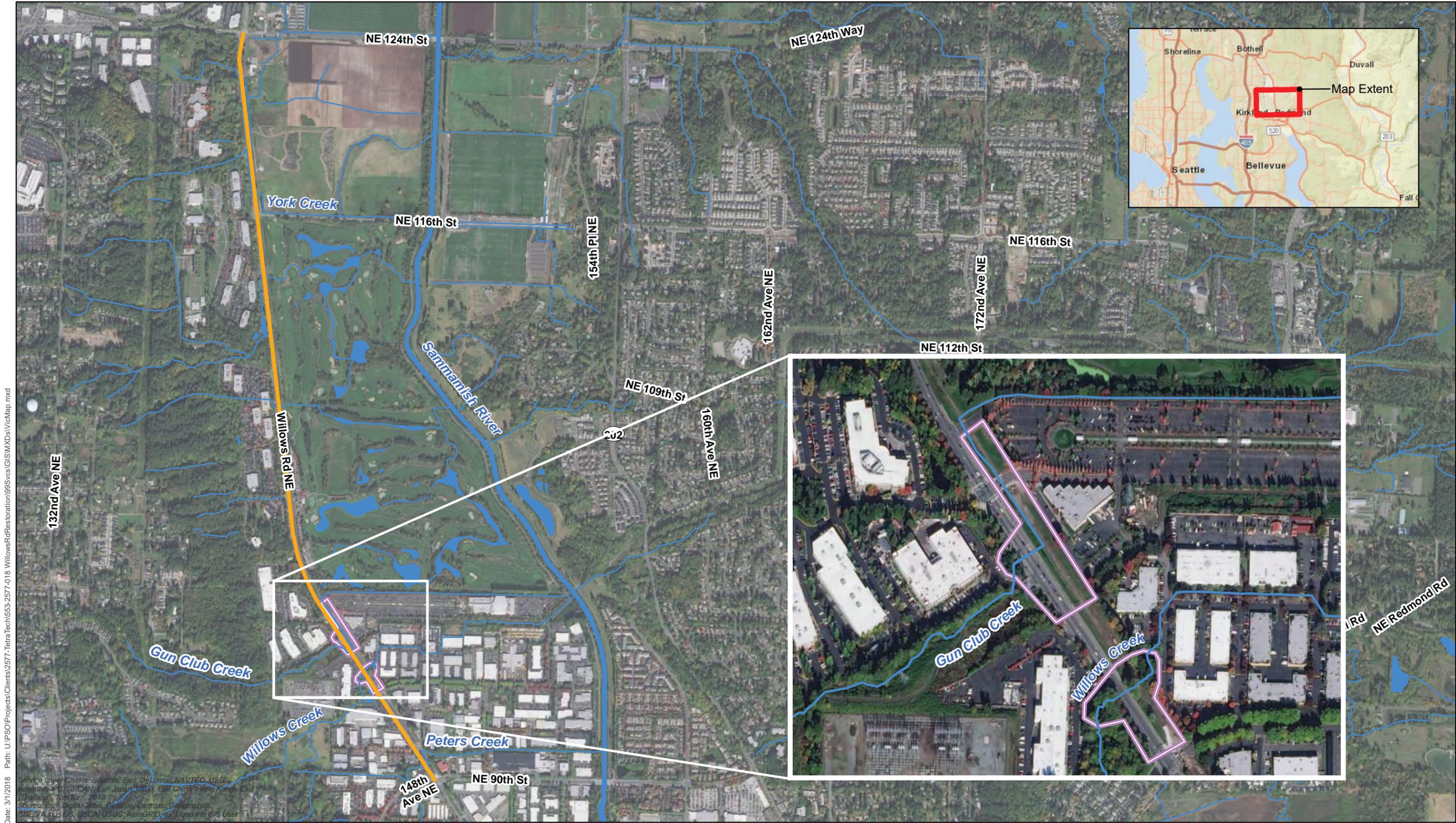
1.2 Site Description and Investigation Areas

The project is located in Redmond, Washington within the right-of-way of Willows Road, between NE 90th Street and NE 124th Street (S2 and S3, T25N, R5E and S27 and S34, T26N, R5E, Willamette Meridian) (Figure 1-1). The northern end of the project area, between NE 116th Street and NE 124th Street, is bordered by the Sammamish Valley Park and agricultural land to the east, and undeveloped forest land with some scattered development (residential and commercial structures) to the west. The central portion of the project area, between NE 100th Court and NE 116th Street, is bordered by the Willows Run Golf Course and a church parking lot to the east, and commercial/office buildings and associated parking areas to the west, with some scattered patches of undeveloped forest land. The southern end of the project area, between NE 90th Street and NE 100th Court, is surrounded by commercial/office buildings and associated parking areas. Topography is relatively flat along the entire project corridor.

The project is located within the Sammamish River, Willows Creek, and Peters Creek watersheds, as described in the *City's Watershed Management Plan* (Herrera 2013). These watersheds are located within Water Resource Inventory Area 8 (Lake Washington/Cedar/Sammamish Watershed).

The wetland and stream field investigation was limited to areas within approximately 100 feet of each end of the Willows Creek and Gun Club Creek culverts on Willows Road (see Figure 1-1). The remainder of project activities will be conducted within the existing road fill prism and will not affect critical areas.

In this report, *project area* refers to the entire project area (the portion of Willows Road extending from NE 90th Street to NE 124th Street). *Investigation areas* refers to the wetland and stream field assessment areas (as described in the paragraph above).



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

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Mile

- Project Corridor
- Stream
- Wetland and Stream Field Investigation Area

Figure 1-1. Vicinity Map and Wetland and Stream Field Investigation Areas
Willows Road Restoration Project

2. METHODS

This critical areas investigation reviewed conditions within the project area, and included field data collection within the wetland and stream field investigation areas (as defined in Section 1.2). The sections below describe the methods for assessing wetlands, FWHCAs (including streams), critical aquifer recharge areas, geologically hazardous areas, and frequently flooded areas.

The wetland and stream analyses are based on data obtained through a review of existing information and during field investigations. The goal of these efforts was to document existing information that reflects current site conditions and to collect new information necessary to assess streams and wetland boundaries.

Critical aquifer recharge areas and frequently flooded areas were evaluated through analysis of existing mapping. Geologically hazardous areas were evaluated through an analysis of existing mapping and data, along with subsurface soil and groundwater investigations.

2.1 Wetland Identification and Delineation

Wetland assessments were based on a review of existing information on previously mapped wetlands and soil mapping, followed by field assessment and delineation. The methods for these assessment steps are described in the sections below.

2.1.1 Existing Information Review

Prior to conducting the wetland field assessment, project biologists reviewed the following maps and materials:

- King County iMap database (King County 2017)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory online interactive mapper (USFWS 2017)
- Priority Habitats and Species (PHS) data from the Washington State Department of Fish and Wildlife (WDFW 2017a)
- City of Redmond wetland inventory map (Redmond 2005a)
- Natural Resources Conservation Service (NRCS) Web soil survey (NRCS 2017)
- Washington State Department of Natural Resources (DNR) Natural Heritage Program (DNR 2017)

2.1.2 Field Assessment

Project biologists used the methods specified in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the indicators described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Corps 2010) to delineate on-site wetlands. The “routine on-site determination method” was used to determine the wetland boundaries. The routine method is used for areas equal to or less than 5 acres, or for larger areas with relatively homogeneous vegetative, soil, and hydrologic properties.

Wetlands are defined as those areas that are inundated or saturated by surface water 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 meet these three criteria or exhibit at least one positive field indicator of wetland vegetation, soils, and hydrology to be considered a wetland. 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 recorded for each wetland.

The delineated wetland boundaries and sample plot locations were instrument-surveyed by professional land surveyors.

The wetland field assessment evaluated vegetation, soils, and hydrologic conditions. Each of these parameters is described in the following subsections.

2.1.2.1 Vegetation

During the field investigations by project biologists, dominant plant species were observed and recorded on data forms for each sample plot. The dominant plants and their wetland indicator status were evaluated to determine whether the vegetation was hydrophytic. Hydrophytic vegetation is generally defined as vegetation adapted to prolonged saturated soil conditions. To meet the hydrophytic vegetation criterion, typically more than 50 percent of the dominant plants must be Facultative, Facultative Wetland, or Obligate, based on the plant indicator status category assigned to each plant species by the USFWS (Lichvar et al. 2016).

Scientific and common plant names follow currently accepted nomenclature. Most names are consistent with *Flora of the Pacific Northwest* (Hitchcock and Cronquist 1973), *Plants of the Pacific Northwest Coast* (Pojar and MacKinnon 1994), and the PLANTS Database (U.S. Department of Agriculture [USDA] 2017).

2.1.2.2 Soils

Generally, an area must have hydric soils to be regulated as 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. Biological activities in saturated soil result in reduced oxygen concentrations that cause a preponderance of organisms using anaerobic processes for metabolism. Over time, anaerobic biological processes result in accumulation of organic soil (e.g., peat) and/or certain mineral soil color patterns, which are used as field indicators of hydric soils. Soils were examined by excavating sample plots to a depth of at least 16 inches, where feasible, to observe soil profiles, colors, and textures. Munsell® color charts (Munsell Color 2010) were used to describe soil colors.

2.1.2.3 Hydrology

The investigation areas were examined for evidence of hydrology. An area is considered to have wetland hydrology when soils are ponded or saturated consecutively for 12.5 percent of the growing season. The growing season, with precipitation measured at the Seattle-Tacoma International Airport (Sea-Tac Airport) station, generally occurs from early February (February 8) to early December (December 10) (Snyder et al. 1973). Therefore, ponding or saturation must be present for approximately 38 consecutive days. Primary indicators of hydrology include surface inundation, sediment deposits, high water table, and saturated soils. Secondary indicators of hydrology include drainage patterns, watermarks on vegetation, and water-stained leaves.

2.1.3 Wetland Classification, Rating, and Functional Assessment

Delineated wetlands were classified according to the USFWS *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979; FGDC 2013) and the hydrogeomorphic (HGM) classification system (Brinson 1993). The *Washington State Wetland Rating System for Western Washington—Revised* (Hruby 2014) was used to rate and assess the functions of wetlands. The City of Redmond has adopted this rating system to classify its wetlands (Redmond Zoning Code [RZC] 21.64.030[A]). Table 2-1 summarizes the City’s rating criteria for each wetland rating criteria. The City assigns protective buffer widths based upon wetland rating category, habitat and water quality functions scores, and intensity of adjacent land use (RZC 21.64.030[B]) (see Section 4.1 for details).

Table 2-1. City of Redmond Wetland Rating Criteria

Category	Rating Criteria
Category I	Category I wetlands are those wetlands that represent a unique or rare wetland type, are more sensitive to disturbance than most wetlands, are relatively undisturbed, and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions. All wetlands with one or more of the following criteria shall be considered a Category I wetland: a) wetlands that are identified by scientists of the Washington Natural Heritage Program/DNR as high-quality, relatively undisturbed wetlands, or wetlands that support state-listed threatened or endangered plants; b) bogs; c) mature and old-growth forested wetlands over one acre in size; or d) wetlands that provide a very high level of functions as evidenced by a score of 23 points or more on the Western Washington Rating System form.
Category II	Category II wetlands are those wetlands that provide high levels of some functions which are difficult to replace. Category II wetlands meet the following criteria: a) wetlands scoring between 20 to 22 points on the Western Washington Rating System form; or b) wetlands that do not meet the criteria of Category I.
Category III	Category III wetlands are those wetlands that provide a moderate level of functions. They are typically more disturbed and have less diversity or are more isolated from other natural resources in the landscape. Category III wetlands meet the following criteria: a) wetlands scoring between 16 to 19 points on the Western Washington Rating System form; or b) wetlands that do not meet the criteria of Category I.
Category IV	Category IV wetlands are those wetlands that provide the lowest level of function. These wetlands score less than 16 points on the Western Washington Rating System form.

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 methods for these assessment steps are described in the sections below.

2.2.1 Existing Information Review

Prior to conducting the stream field assessment, project biologists reviewed the following maps and materials:

- King County iMap database (King County 2017)
- PHS data from WDFW (WDFW 2017a)

- WDFW SalmonScape database (WDFW 2017b)
- City of Redmond stream classification map (Redmond 2016a)
- City of Redmond Watershed Management Plan (Herrera 2013)
- Biological Assessment for the Redmond Central Connector Phase II project (Otak 2015)
- Gun Club Creek fish trap data (Redmond 2017)
- Willows Creek fish removal data (Taylor Associates, Inc. 2006)

2.2.2 Field Assessment

Project biologists conducted a field study of the investigation areas to evaluate features that meet stream criteria. A *stream* is defined by the City of Redmond (RZC 21.78) as:

Those areas where surface waters produce a defined channel or bed. A defined channel or bed is an area which demonstrates clear evidence of the passage of water and includes, but is not limited to, bedrock, channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed need not contain water year-round. This definition is not meant to include artificially created irrigation ditches, canals, storm, or surface water runoff devices or other entirely artificial watercourses unless they are used by salmonid or created for the purposes of stream mitigation.

The OHWM was determined and delineated for all streams in the investigation areas using methods developed by the Washington State Department of Ecology (Ecology) (Stockdale et al. 2016). The OHWM flags were instrument-surveyed by professional land surveyors.

2.2.3 Stream Classification

Streams were classified according to RZC 21.64.020(A)(2)(d). Table 2-2 summarizes the City classification criteria for each stream class. The City assigned protective buffer widths based upon stream classification (RZC 21.64.020[B]) (see Section 4.2).

Table 2-2. City of Redmond Stream Classification Criteria

Class	Classification Criteria
Class I	Class I streams are those streams identified as “Shorelines of the State” under the City of Redmond Shoreline Master Program.
Class II	Class II streams are those natural streams that are not Class I and are either perennial or intermittent and have salmonid fish use or the potential for salmonid fish use.
Class III	Class III streams are those natural streams that are not Class I or Class II and are either perennial or intermittent and have one of the following characteristics: a) non-salmonid fish use or the potential for non-salmonid fish use; or b) headwater streams with a surface water connection to salmon-bearing or potentially salmon-bearing streams (Class I or II).
Class IV	Class IV streams are those natural streams that are not Class I, Class II, or Class III. They are either perennial or intermittent, do not have fish or the potential for fish, and are non-headwater streams.

2.3 Fish and Wildlife Habitat Conservation Areas

Along with streams, the following are designated and regulated as FWHCAs under RZC 21.64.010:

- Areas with which species of concern have a primary association, including:
 - Federally designated endangered and threatened species
 - State-designated endangered, threatened, and sensitive species
- State priority habitats and areas associated with state priority species
- Habitats and species of local importance
- Naturally occurring ponds smaller than 20 acres
- Waters of the State
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity
- Land essential for preserving connections between habitat blocks and open spaces

Habitats and species were identified using the maps and materials listed in Section 2.2.1, along with the City of Redmond FWHCA map (Redmond 2005b). Observations gathered in the investigation areas during field investigations were also used to evaluate habitat conditions.

2.4 Critical Aquifer Recharge Areas

Wellhead protection zones are designated and classified as critical aquifer recharge areas under RZC 21.64.050. Zones are classified as follows:

- Wellhead Protection Zone 1 represents the land area overlying the 6-month time-of-travel zone of any public water source well owned by the City.
- Wellhead Protection Zone 2 represents the land area that overlies the 1-year time-of-travel zone of any public water source well owned by the City, excluding the land area contained within Wellhead Protection Zone 1.
- Wellhead Protection Zone 3 represents the land area that overlies the 5-year and 10-year time-of-travel zones of any public water source well owned by the City, excluding the land area contained within Wellhead Protection Zone 1 or 2.
- Wellhead Protection Zone 4 represents all the remaining land area in the city not included in Wellhead Protection Zones 1, 2, or 3.

Project biologists reviewed the City of Redmond wellhead protection zone map (City of Redmond 2010), which shows wellhead protection zone boundaries and classifications.

2.5 Geologically Hazardous Areas

Erosion, seismic, and landslide hazard areas are designated and regulated as geologically hazardous areas under RZC 21.64.060. These areas are identified and shown in City of Redmond critical areas maps (Redmond 2005c, 2005d, and 2016b).

A geologic assessment of the project area is currently being finalized (GeoEngineers 2018).

2.6 Frequently Flooded Areas

Frequently flooded areas, which include the 100-year (1 percent annual chance) floodplain, flood fringe, floodway, and zero-rise floodway, are designated and regulated under RZC 21.64.040. These areas are identified and shown in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) (1999) and City of Redmond critical areas maps (Redmond 2005e).

3. RESULTS

The results of the background information review for critical areas and the wetland and stream field assessment are presented below. The field assessment was conducted by project biologists on November 28 and December 5, 2017. As detailed in Section 1.2, the investigation areas for the wetland and stream field assessment was limited to areas within approximately 100 feet of each end of the Willows Creek and Gun Club Creek culverts under Willows Road.

Maps related to the existing information review are presented in Appendix A, and photographs of the investigation areas are included in Appendix B.

3.1 Wetland Identification and Delineation

3.1.1 Existing Information Review

3.1.1.1 Previously Mapped Wetlands

National Wetlands Inventory (USFWS 2017) and PHS on the Web (WDFW 2017a) mapping identify a large emergent wetland area just east of Willows Road in the project vicinity, on the Willows Run Golf Complex and Sammamish Valley Park properties. The King County iMap (King County 2017) application does not identify any wetlands within the project vicinity.

The City of Redmond wetland inventory map (Redmond 2005a) identifies a large “Mixed Wetland/Upland” area directly east of Willows Road in the project vicinity; the wetland includes and extends northward and eastward from the Willows Run Golf Complex and Sammamish Valley Park properties. The map also identifies several wetland areas located on either side of Willows Road in the project vicinity. These mapped wetlands appear to be associated with Willows Creek and other streams and drainages in the project vicinity.

The DNR Natural Heritage Program does not identify any rare plants or habitats within the project area (DNR 2017).

3.1.1.2 Mapped Soils

Soils along Willows Road in the southern portion of the project area (between NE 90th Street and NE 116th Street) are mapped as primarily Indianola loamy sand, with an area of Earlmont silt loam mapped near the intersection of Willows Road and NE 100th Court (NRCS 2017). In the northern portion of the project area (between NE 116th Street and NE 124th Street), soils are mapped (from south to north) as Earlmont silt loam, Alderwood gravelly sandy loam, Tukwila muck, and Earlmont sandy loam (see the soil map in Appendix A).

The Indianola series is composed of somewhat excessively drained soils formed from glacial outwash; the Earlmont series is composed of somewhat poorly drained soils formed in floodplains from diatomaceous earth; the Alderwood series is composed of moderately well-drained soils formed from glacial drift and/or glacial outwash; and the Tukwila series is composed of very poorly drained soils formed from herbaceous organic material (NRCS 2017). Earlmont silt loam and Tukwila muck are classified as hydric. The other soil types are not classified as hydric, although hydric inclusions may be present.

3.1.2 Field Assessment

The results of the wetland field assessment are detailed below. As stated in Section 1.2, the investigation areas for the wetland field assessment was limited to areas within approximately 100 feet of each end of the Willows Creek and Gun Club Creek culverts on Willows Road.

Field investigations mapped six wetlands (Wetlands A through F). Attributes of the wetlands are summarized in Table 3-1. Wetlands are mapped in Figures 3-1 and 3-2. Photographs of the wetlands are included in Appendix B; wetland data forms are presented in Appendix C; and wetland rating forms are located in Appendix D.

Table 3-1. Summary of Wetlands in the Investigation Areas

Wetland Name	Size (acres)	USFWS Classes ¹	HGM Class	Wetland Category	Buffer Width (ft)
A	0.065	PEM, RAB	Riverine	III	80
B	0.106	PEM, RAB	Riverine	III	80
C	~ 0.15	PUB, PEM, PFO	Depressional	III	N/A ²
D	0.034	PEM, PSS, PFO	Slope	III	150
E	~ 0.1	PSS, PFO	Slope	III	N/A ²
F	0.037	PSS, PFO	Slope	IV	N/A ²

¹ PEM = Palustrine Emergent, RAB = Riverine Aquatic Bed; PUB = Palustrine Unconsolidated Bottom; PFO = Palustrine Forested; PSS = Palustrine Scrub-Shrub

² Wetland is a constructed stormwater facility (see as-built plans in Appendix E), and is not considered a regulated wetland by the City (see 'wetland' definition in RZC 21.78).

3.1.2.1 Wetland A

Size: 0.065 acre

Redmond/Ecology Rating: III

Buffer: 80 feet

USFWS Classification: Palustrine Emergent/Riverine Aquatic Bed

HGM Classification: Riverine

Sample Plots: SP-1 (wetland) and SP-2 (adjacent upland)

Wetland A is a narrow, ditched wetland located north of NE 100th Court, between Willows Road and the Redmond Central Connector Trail (Figure 3-1) (Photo 1). The wetland is associated with Gun Club Creek, which is its primary source of hydrology. Wetland A/Gun Club Creek receives flow from a culvert under NE 100th Court, flows northwestward, then into a culvert under the Overlake Christian Church parking lot driveway. Gun Club Creek appears to be a permanently flowing stream; the remainder of Wetland A is seasonally flooded. Indicators of wetland hydrology observed at the time of the field visit included soil saturation and a high water table at the soil surface (A1 and A2) and oxidized rhizospheres (C3).

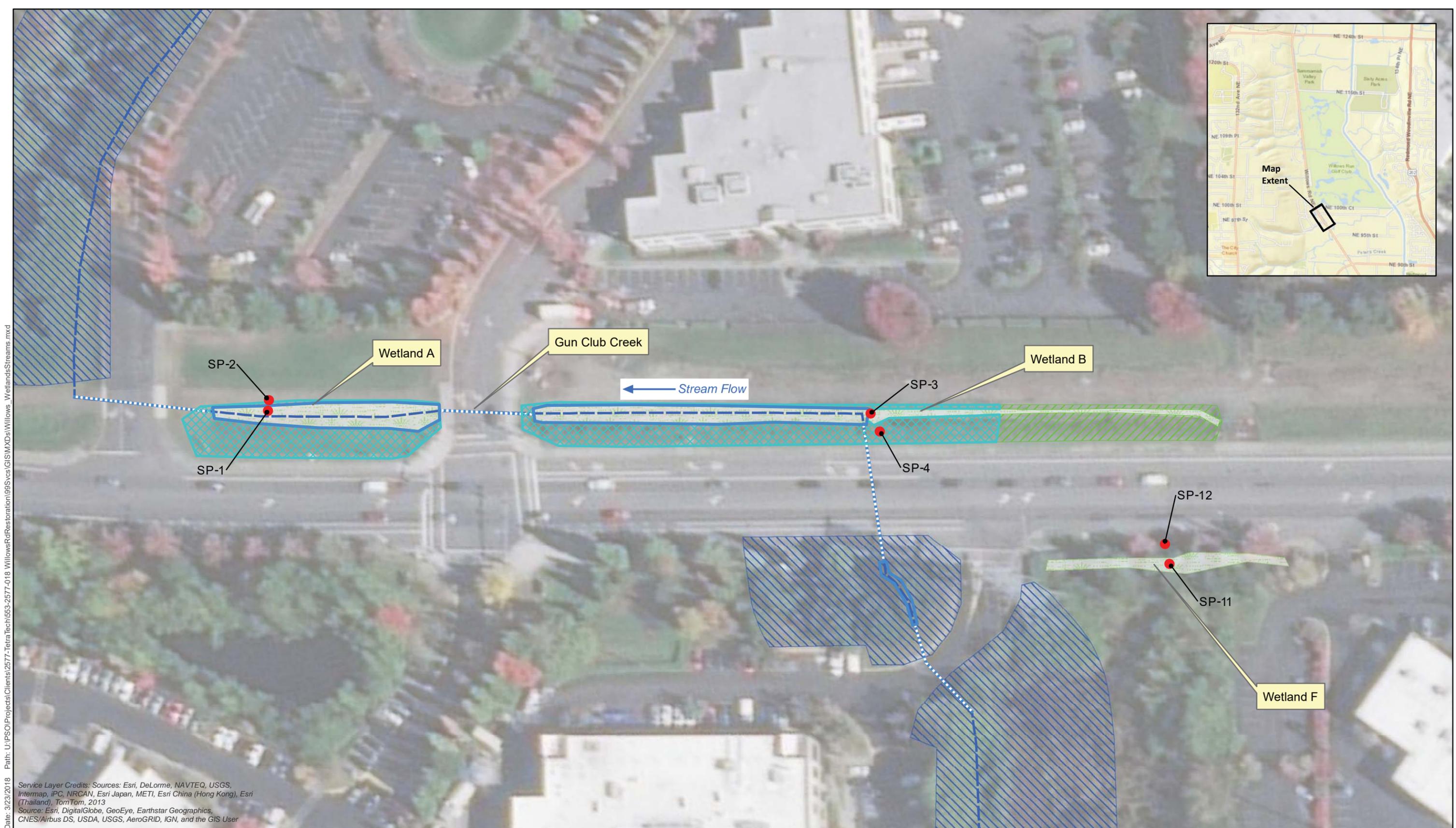
Soil was sampled at SP-1 to a depth of 16 inches and consisted of two layers. The top layer is an 8-inch-thick very dark gray (10YR 3/1) gravelly silt loam. The lower layer is a gray (5Y 5/1) clay loam with dark brown (7.5YR 3/4) and very dark gray (10YR 3/1) redoximorphic features. The soil meets the criteria for the hydric soil indicator *Depleted Below Dark Surface* (A11).

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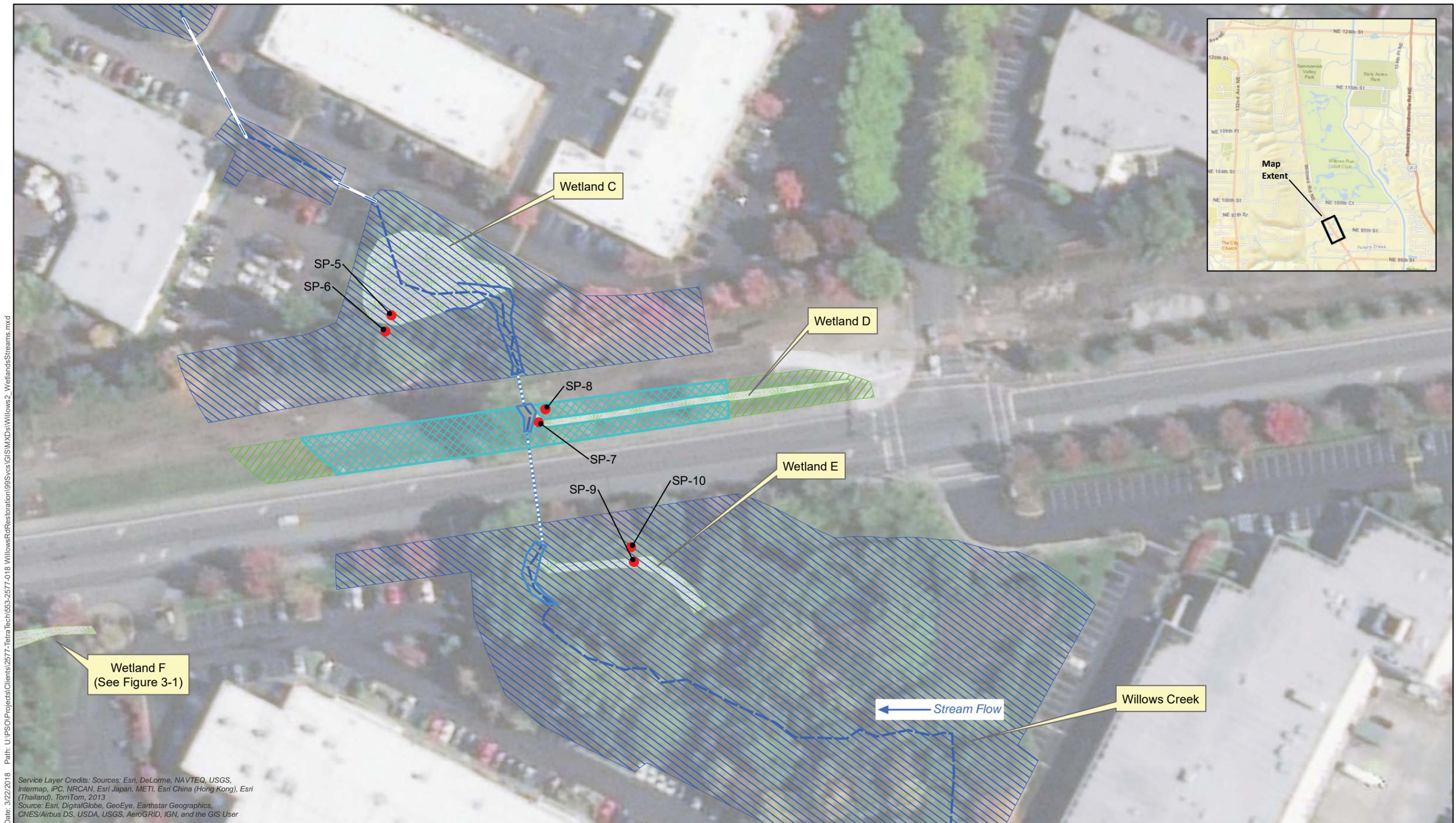
Parametrix

0 40 80 160 Feet



- Wetland
- Stream OHWM
- Stream
- Combined Wetland/Stream Buffer
- Wetland Buffer
- Stream Buffer
- Stream in Culvert
- Wetland Sample Plots

Figure 3-1. Wetlands, Streams, and Buffers: Gun Club Creek Vicinity
 Willows Road Restoration Project



Path: U:\PSO\Projects\Clients\2577-Tetra Tech\553-2577-018_WillowsRdRestoration\99Svcs\GIS\MXD\Willows2_WetlandsStreams.mxd
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 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

Parametrix

0 40 80 160 Feet

- Wetland
- Stream OHHM
- Stream
- Combined Wetland/Stream Buffer
- Wetland Buffer
- Stream Buffer
- Stream in Culvert
- Wetland Sample Plots

Figure 3-2. Wetlands, Streams, and Buffers: Willows Creek Vicinity
Willows Road Restoration Project

Wetland A contains palustrine emergent and riverine aquatic bed vegetation communities. The aquatic bed vegetation community, which is contained within the OHWM of Gun Club Creek, is dominated by watercress (*Nasturtium officinale*). The emergent community, which is located along the wetland fringe, consists primarily of Baltic rush (*Juncus balticus*) and reed canarygrass (*Phalaris arundinacea*). The existing vegetated buffer of Wetland A is narrow (approximately 10 feet wide) and consists primarily of mowed grass. The adjacent upland is characterized in SP-2.

Wetland A is a palustrine emergent and riverine aquatic bed wetland under the USFWS system (Cowardin 1979; FGDC 2013) and a riverine wetland under the HGM system (Brinson 1993). The wetland is rated a Category III wetland according to the state and Redmond rating systems. Overall, the wetland received moderate scores for improving water quality (6 points) and hydrologic (7 points) functions because the wetland is located in an urbanized area with water quality impairments and flooding problems and is densely vegetated, but these functions are limited primarily by a periodic mowing within the wetland and lack of overbank storage potential. Wetland A scored low for habitat functions (4 points) due to low plant community type and hydroperiod diversity, lack of undisturbed connections to off-site habitat areas, and lack of special habitat features (e.g., snags and undercut banks).

3.1.2.2 Wetland B

Size: 0.106 acres

Redmond/Ecology Rating: III

Buffer: 80 feet

USFWS Classification: Palustrine Emergent/Riverine Aquatic Bed

HGM Classification: Riverine

Sample Plots: SP-3 (wetland) and SP-4 (adjacent upland)

Wetland B is a narrow, ditched wetland located south of NE 100th Court, between Willows Road and the Redmond Central Connector Trail (Figure 3-1) (Photo 2). The northern half of the wetland is associated with Gun Club Creek, which is its primary source of hydrology. Wetland B/Gun Club Creek receives flow from a culvert under Willows Road, flows northwestward, then into a culvert under NE 100th Court that discharges into Wetland A. The primary source of hydrology to the southern portion of Wetland B is a culvert that drains a wetland (Wetland F) located on the west side of Willows Road.

Gun Club Creek appears to be a permanent stream; the remainder of Wetland B contains areas that are seasonally and occasionally flooded. The primary observed indicator of wetland hydrology at the time of the field visit was saturation up to the soil surface (A3).

Soil was sampled at SP-3 to a depth of 16 inches and consisted of two layers. The top layer is a 4-inch-thick very dark brown (10YR 2/2) silt loam. The lower layer is a very dark gray (10YR 3/1) loam with dark brown (7.5YR 3/4) redoximorphic features. The soil meets the criteria for the hydric soil indicator *Redox Dark Surface* (F6).

Wetland B contains palustrine emergent and riverine aquatic bed vegetation communities. The aquatic bed vegetation community, which is contained within the OHWM of Gun Club Creek, is dominated by watercress. The emergent community, which is located along the wetland fringe and the portion of Wetland B that extends south from Gun Club Creek, consists primarily of reed canarygrass and common cattail (*Typha latifolia*). The existing vegetated buffer of Wetland B is narrow (approximately 10 feet wide) and consists primarily of mowed grass. Several recently planted western red cedar (*Thuja plicata*) and Douglas fir (*Pseudotsuga menziesii*) saplings are located in the buffer area west of the wetland. The adjacent upland is characterized in SP-4.

Wetland B is a palustrine emergent and riverine aquatic bed wetland under the USFWS system (Cowardin et al. 1979; FGDC 2013) and a riverine wetland under the HGM system (Brinson 1993). The wetland is rated a Category III wetland according to the state and Redmond rating systems. Overall, the wetland received moderate scores for improving water quality (6 points) and hydrologic (7 points) functions because the wetland is located in an urbanized area with water quality impairments and flooding problems and is densely vegetated, but these functions are limited primarily by periodic mowing within the wetland and lack of overbank storage potential. Wetland B scored low for habitat (4 points) functions due to low plant community type and hydroperiod diversity, lack of undisturbed connections to off-site habitat areas, and lack of special habitat features (e.g., snags and undercut banks).

3.1.2.3 Wetland C

Size: Approximately 0.15 acre

Redmond/Ecology Rating: III

Buffer: Not applicable (N/A) (wetland is a constructed stormwater facility/sediment pond)

USFWS Classification: Palustrine Unconsolidated Bottom/Emergent/Forested

HGM Classification: Depressional

Sample Plots: SP-5 (wetland) and SP-6 (adjacent upland)

Wetland C is a depressional wetland located north of the Willows Road/NE 95th Street intersection and just east of the Redmond Central Connector Trail (Figure 3-2) (Photo 3). The wetland was constructed in 1984, and functions as an inline stormwater facility/sediment pond (Appendix E). The wetland consists of a permanently inundated pond fringed by palustrine emergent and forested habitats. Willow Creek, which flows into the wetland from the west, is the primary source of hydrology to the wetland. The water from the wetland discharges through a culvert at the northern end of the pond, east of the wetland investigation area. Indicators of wetland hydrology observed at the time of the field visit included saturation at the soil surface (A1) and a high water table (A3).

Soil was sampled at SP-5 to a depth of 16 inches and consisted of two layers. The top layer is a 4-inch-thick very dark gray (2.5Y 3/1) silt loam. The lower layer is a very dark gray (2.5Y 3/1) silt loam with dark brown (7.5YR 3/4) redoximorphic features. The soil meets the criteria for the hydric soil indicator *Redox Dark Surface* (F6).

Wetland C contains emergent and forested vegetation communities. The emergent community, which is primarily located along the northern edge of the pond, is dominated by reed canarygrass and creeping buttercup (*Ranunculus repens*). The forested vegetation community consists primarily of red alder (*Alnus rubra*) with an understory of salmonberry (*Rubus spectabilis*) and Himalayan blackberry (*Rubus armeniacus*). The buffer of Wetland C averages approximately 20 feet in width and consists of forest cover, with patches of grasses and herbaceous weeds. The adjacent upland is characterized in SP-6.

Wetland C is a palustrine unconsolidated bottom, emergent, and forested wetland under the USFWS system (Cowardin et al. 1979; FGDC 2013) and a depressional wetland under the HGM system (Brinson 1993). The wetland is rated a Category III wetland according to the state and Redmond rating systems. Overall, the wetland received moderate scores for improving water quality (7 points) and hydrologic (6 points) functions because the wetland is a depressional wetland located in an urbanized area with water quality impairments and flooding problems, but these functions are limited primarily by the presence of a permanently flowing water outlet and lack of seasonally ponded areas. Wetland D also scored as moderate for habitat (6 points) functions due to the presence of multiple plant community and hydroperiod types, special habitat features (e.g., snags and logs), and adjacent WDFW-designated priority habitats (e.g., riparian and instream). Habitat functions are limited primarily due to a lack of connections to off-site habitat areas.

3.1.2.4 Wetland D

Size: 0.034 acre

Redmond/Ecology Rating: III

Buffer: 150 feet

USFWS Classification: Palustrine Emergent/Scrub-Shrub/Forested

HGM Classification: Slope

Sample Plots: SP-7 (wetland) and SP-8 (adjacent upland)

Wetland D is a narrow, ditched wetland located north of NE 95th Street, between Willows Road and the Redmond Central Connector Trail (Figure 3-2) (Photo 4). The primary source of hydrology to the wetland is runoff from the adjacent trail and roads. Wetland D drains northward and discharges directly into Willows Creek. Indicators of wetland hydrology observed at the time of the field visit included saturation at the soil surface (A3) and a high water table (A2).

Soil was sampled at SP-7 to a depth of 16 inches and consists of three layers. The top layer is a 4-inch-thick very dark grayish brown (10YR 3/2) loam, and the middle layer is a 4-inch-thick very dark gray (10YR 3/1) loam. The lower layer starts at a depth of 8 inches, and is a very dark gray (10YR 3/1) loam with dark reddish brown (5YR 3/4) redoximorphic features. The soil meets the criteria for the hydric soil indicator *Redox Dark Surface* (F8).

The northern end of Wetland D contains a palustrine forested vegetation community, which is dominated by red alder. The remainder of the wetland contains patches of palustrine scrub-shrub and emergent cover, which is dominated by Himalayan blackberry, black cottonwood (*Populus balsamifera*) saplings, and reed canarygrass. The buffer of Wetland A is approximately 10 feet and width, and consists primarily of mowed grasses. The adjacent upland is characterized in SP-8.

Wetland D is a palustrine emergent, scrub-shrub, and forested wetland under the USFWS system (Cowardin et al. 1979; FGDC 2013) and a slope wetland under the HGM system (Brinson 1993). The wetland is rated a Category III wetland according to the state and Redmond rating systems. Overall, the wetland received moderate scores for improving water quality (7 points) and hydrologic (6 points) functions because the wetland is located in an urbanized area with water quality impairments and flooding problems and contains dense, rigid plants that can reduce the velocity of surface water flows and trap sediments. However, as a slope wetland, these functions are limited by the wetland's limited ability to store surface flows.

Wetland D scored as moderate for habitat (6 points) functions due to the presence of multiple plant community and hydroperiod types, special habitat features (e.g., snags and logs), and adjacent WDFW-designated priority habitats (e.g., riparian and instream). Habitat functions are limited primarily due to a lack of connections to off-site habitat areas.

3.1.2.5 Wetland E

Size: Approximately 0.1 acre

Redmond/Ecology Rating: III

Buffer: N/A (wetland is a constructed biofiltration swale)

USFWS Classification: Palustrine Scrub-Shrub/Forested

HGM Classification: Slope

Sample Plots: SP-9 (wetland) and SP-10 (adjacent upland)

Wetland E is a slope wetland located west of Willows Road and immediately south of Willows Creek (Figure 3-2) (Photo 5). The wetland is a constructed biofiltration swale, created in 1995, that receives flow from a stormwater detention pond to the south (Appendix E). Wetland E discharges to Willows Creek to the north. Indicators of wetland hydrology observed at the time of the field visit included saturation at the soil surface (A1) and a high water table (A3). Wetland E extends east along Willows Creek, outside of the investigation area.

Soil was sampled at SP-9 to a depth of 16 inches and consisted of three layers. The top layer is a 6-inch-thick layer of primarily gray (2.5Y 5/1) loam, with inclusions of dark gray (2.5Y 4/1) sand with yellowish red (5YR 5/6) redoximorphic features. The middle layer (extending from 6 to 12 inches below the soil surface) is a gray (2.5Y 5/1) and dark gray (2.5Y 4/1) sandy loam, with yellowish brown (10YR 5/6) redoximorphic features. The lower layer (extending from 12 to over 16 inches below the soil surface) is a gray (2.5Y 5/1) and dark gray (2.5Y 4/1) sandy loam with yellowish brown (10YR 5/8) redoximorphic features. The soil meets the criteria for the hydric soil indicator *Depleted Matrix* (F3).

Wetland E contains a forested vegetation community dominated by red alder (*Alnus rubra*), with an understory of Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass. The northwestern portion of the wetland contains a scrub-shrub community that contains Himalayan blackberry and red-osier dogwood (*Cornus sericea*). The buffer along the west side of Wetland E is forested and undisturbed, while the buffer along the east side is narrow (approximately 15 feet wide) and contains primarily mowed grass. The adjacent upland is characterized in SP-10.

Wetland E is a palustrine scrub-shrub and forested wetland under the USFWS system (Cowardin 1979; FDGC 2013) and a slope wetland under the HGM system (Brinson 1993). The wetland is rated a Category III wetland according to the state and Redmond rating systems. Overall, the wetland received moderate scores for improving water quality (6 points) and hydrologic (5 points) functions because the wetland is located in an urbanized basin with water quality impairments and flooding problems and contains dense plant cover that can trap sediments. However, as a slope wetland, these functions are limited by the wetland's limited ability to store surface flows.

Wetland E scored as moderate for habitat (6 points) functions due to the presence of multiple plant community and hydroperiod types, special habitat features (e.g., snags and logs), and adjacent WDFW-designated priority habitats (e.g., riparian and instream). Habitat functions are limited primarily due to a lack of connections to off-site habitat areas.

3.1.2.6 Wetland F

Size: 0.037 acre

Redmond/Ecology Rating: IV

Buffer: N/A (wetland is a constructed biofiltration swale)

USFWS Classification: Palustrine Scrub-Shrub/Forested

HGM Classification: Slope

Sample Plots: SP-11 (wetland) and SP-12 (adjacent upland)

Wetland F is located west of Willows Road and south of Gun Club Creek (Figure 3-1) (Photo 6). The wetland is a constructed biofiltration swale that was created in 1995 (Appendix E). The swale's primary source of hydrology is runoff from the adjacent slope to the west and Willows Road to the east. The swale drains to a culvert at its north end, which drains under Willows Road into Wetland B/Gun Club Creek. Indicators of wetland hydrology observed at the time of the field visit included saturation at the soil surface (A3), a high water table (A2), and surface water (A1).

Soil was sampled at SP-11 to a depth of 16 inches and consisted of three layers. The top layer is a 3-inch-thick layer of very dark brown (10YR 2/2) gravelly sandy loam, and the middle layer is a 5-inch-thick layer of dark gray (10YR 4/1) gravelly sandy loam with strong brown (7.5YR 4/6) redoximorphic features. The lower layer (extending from 8 inches to over 16 inches below the soil surface) is a dark gray (10YR 4/1) gravelly sandy loam with yellowish red (5YR 4/6) and strong brown (7.5YR 4/6) redoximorphic features. The soil meets the criteria for the hydric soil indicators *Depleted below Dark Surface* (A11) and *Depleted Matrix* (F3).

A scrub-shrub vegetation community is present in the northern portion of Wetland F; dominant plant species are red-osier dogwood and Himalayan blackberry. The southern portion of the wetland contains a forested community, which is dominated by red alder with an understory of reed canarygrass. The buffer along the west side of Wetland F is forested and undisturbed, while the buffer along the east side is narrow (approximately 15 feet wide) and contains primarily mowed grass and ornamental shrubs. The adjacent upland is characterized in SP-12.

Wetland F is a palustrine emergent, scrub-shrub, and emergent wetland under the USFWS system (Cowardin et al. 1979; FGDC 2013) and a slope wetland under the HGM system (Brinson 1993). The wetland is rated a Category IV wetland according to the state and Redmond rating systems. Overall, the wetland received moderate scores for improving water quality (6 points) and hydrologic (5 points) functions because the wetland is located in an urbanized basin with water quality impairments and flooding problems and also contains dense plant cover that can trap sediments but lacks rigid plants that can reduce the velocity of surface flows and has a slope of greater than 2 percent. Wetland F scored as low for habitat (4 points) functions due primarily to a lack of connections to off-site habitat areas and a low diversity of hydroperiods and vegetation communities.

3.2 Stream Identification and Delineation

3.2.1 Existing Information Review

3.2.1.1 Previously Mapped Streams

King County iMap (2017) and WDFW SalmonScape (2017b) data identify several perennial and ephemeral streams that cross the project area. For the purposes of this report, the focus will be on two of the streams, Willows Creek and Gun Club Creek. WDFW has identified the Gun Club Creek and Willows Creek culverts under Willows Road as partial fish barriers. The project as proposed will replace both culverts with new, larger fish-passable culverts.

City of Redmond (2016a) stream mapping identifies Willows Creek as a Class II stream within the project area. Gun Club Creek is identified as a Class III stream upstream of Willows Road, and for a short distance where Willows Creek flows parallel with Willows Road downstream of the culvert beneath Willows Road. Gun Club Creek transitions into a Class IV stream in the reach farther downstream and outside the project area just before its confluence with the Sammamish River.¹

In August 2006, fish removal and relocation activities were conducted on Willows Creek, in conjunction with the Willows Business Park Stream Daylighting Project (Taylor Associates, Inc. 2006). The project was conducted on a 500-foot section of Willows Creek, downstream of the project area. Biologists identified several aquatic species in the creek during removal and relocation activities, including crayfish (*Cambarus* sp.), lamprey (*Lampetra* sp.), stickleback (*Gasterosteus* sp.), mottled sculpin (*Cottus bairdii*), and cutthroat trout (*Oncorhynchus clarkii*).

Fish-trapping activities were conducted within Gun Club Creek in July 2017, in conjunction with a ditch-cleaning project that was conducted immediately downstream from the Gun Club Creek/Willows Road culvert (Redmond 2017). Aquatic species trapped include three-spined stickleback (*Gasterosteus aculeatus*), crayfish, sculpin (*Cottus* sp.) and snail (unknown genus/species).

3.2.2 Field Assessment

The results of the stream field assessment are detailed below. As noted in Section 1.2, the field assessment investigation areas were limited to the areas immediately upstream and downstream of the Gun Club Creek and Willows Creek culverts on Willows Road. Gun Club Creek and Willows Creek were the only streams observed in the investigation areas. Their attributes are described in the following sections.

3.2.2.1 Gun Club Creek

Immediately upstream (west) of the project area, Gun Club Creek flows northeastward adjacent to a stormwater pond, then enters a culvert under the 9845 Willows Road office building driveway (Figure 1-1). A short section (approximately 50 feet) of open stream channel is located downstream (northwest) of the driveway (Figure 3-1) (Photo 7). The channel in this location is approximately 4 feet

¹ RZC 21.64.020 defines Class II streams as natural streams that are not designated as Shorelines of the State, but have the potential for salmonid fish use. Class III streams are defined as natural streams that are not Shorelines of the State and have potential for non-salmonid fish use and/or are headwater streams with a surface water connection to a potentially salmonid-bearing stream.

wide with a cobble substrate. At the time of the field assessment, flowing water (approximately 4 inches deep) was observed in the channel. Riparian vegetation in this area consists primarily of mowed grass and ornamental evergreen trees.

Gun Club Creek then flows out of the culvert under Willows Road into Wetland B (Figure 3-1) (Photo 2). The stream channel in this location is an approximately 6-foot-wide linear ditch with a silt substrate, situated between Willows Road and the Redmond Central Connector Trail. The stream flows northwestward through a culvert under NE 100th Court, through Wetland A (Photo 1), then through another culvert under the Overlake Christian Church parking lot driveway. At the time of the field assessment, flowing water (approximately 10 inches deep) was observed in this stream reach. Riparian vegetation in this area consists primarily of emergent wetland vegetation and mowed grass (see wetland descriptions in Sections 3.1.2.1 and 3.1.2.2 for details).

After flowing through the culvert under the Overlake Christian Church parking lot driveway, Gun Club Creek flows east within a linear ditch between the parking lot and the southern boundary of the Willows Run Golf Complex (Figure 1-1). The stream then flows into a culvert under the Sammamish River Trail, which outfalls directly into the Sammamish River.

Under RZC 21.64.020, Gun Club Creek in the project area meets the criteria to be considered a Class III stream (see Section 4.2 for details). Class III streams receive a standard buffer of 100 feet.

3.2.2.2 Willows Creek

Immediately upstream (southwest) of the project vicinity, Willows Creek flows through a forested area then enters a culvert under Willows Road (Figures 1-1 and 3-2). The stream channel upstream of the culvert is approximately 6 feet wide with a sand and very fine gravel substrate. At the time of the field assessment, flowing water (approximately 10 inches deep) was observed in the channel. Riparian vegetation in this area consists primarily of reed canarygrass, Himalayan blackberry, and red-osier dogwood, with an overstory of red alder. Wetland E drains into Willows Creek from the south, directly upstream (west) of Willows Road.

Willows Creek then flows out of the culvert under Willows Road, flows through an open channel for approximately 15 feet, then flows into a recently replaced culvert under the Redmond Central Connector Trail (Figure 3-2) (Photo 9). The stream channel in this location is approximately 10 feet wide, with a cobble and gravel substrate; the substrate was likely placed in the stream during culvert installation. At the time of the field assessment, flowing water (approximately 10 inches deep) was observed in the channel. Riparian vegetation in this area consists primarily of reed canarygrass with an overstory of red alder. Wetland D drains into Willows Creek from the south, directly downstream (east) of Willows Road.

Downstream (east) of the Redmond Central Connector Trail, Willows Creek flows approximately 20 feet then empties into a ponded area (Wetland C), which is a constructed stormwater facility and inline sediment trap (Figure 3-2) (Photo 3). The pond is dominated by silt substrate, and was inundated over 2 feet deep during the field assessment. Wetland C/Willows Creek drains to a culvert at the north end of the sediment pond. Riparian vegetation in the pond vicinity consists primarily of emergent wetland vegetation and red alder (see wetland description in Section 3.1.2.3 for details).

Downstream of the pond, Willows Creek flows generally eastward through a series of piped and open channel sections (Figure 1-1). The creek discharges to the Sammamish River through a culvert under the Sammamish River Trail, near the outlet of Gun Club Creek.

Under RZC 21.64.020, Willows Creek meets the criteria to be considered a Class II stream (see Section 4.2 for details). Class II streams receive a standard buffer of 150 feet, consisting of a 100-foot inner buffer and a 50-foot outer buffer.

3.3 Fish and Wildlife Habitat Conservation Areas

In accordance with RZC 21.64.020, Gun Club Creek and Willows Creek are designated FWHCAs because they are “Waters of the State.” Additionally, Willows Creek provides habitat for a state priority species (coho salmon) WDFW 2017b).

City mapping (Redmond 2005b) identifies several “core preservation areas” adjacent to the project area. These include a Transfer Development Rights Easement east of Willows Road and NE 116th Street, an Open Space Easement west of the Willows Road/NE 116th Street intersection, and three Native Growth Protection Easements west of Willows Road that are associated with Gun Club Creek, Willows Creek, and Peters Creek.

3.4 Critical Aquifer Recharge Areas

According to City of Redmond mapping (2010), the majority of the project area is mapped as Wellhead Zone 4, with an area of Wellhead Zone 2 mapped along the east side of Willows Road immediately north of NE 90th Street.

3.5 Geologically Hazardous Areas

City of Redmond mapping (Redmond 2005c, 2016b) identifies erosion and landslide hazard areas just west of the project area, near the corner of Willows Road and NE 124th Street. Nearly the entire project area, from NE 90th Street at the south to NE 116th Street, is within a mapped seismic hazard area (Redmond 2005d). The draft geological study for the project (GeoEngineers 2018) states that the project area has a moderate risk of liquefaction, because of the relatively high groundwater table and presence of loose to medium-dense alluvial deposits. The study also states that there is a low risk in seismically induced landslides due to the relative flatness of the site. See the geological study for additional details (GeoEngineers 2018).

3.6 Frequently Flooded Areas

FEMA (1999) and City of Redmond (2005e) maps do not identify any frequently flooded areas within the project area.

4. REGULATORY IMPLICATIONS

Wetlands and streams within the project area are subject to federal, state, and City of Redmond regulations. At the federal level, wetlands and streams are regulated by the Clean Water Act (CWA) Section 404, which regulates placement of fill in waters of the United States. The U.S. Army Corps of Engineers (Corps) is responsible for issuing permits under Section 404 of the CWA.

Activities that affect wetlands and streams may also require a water quality certification (Section 401 of the CWA), which is implemented at the state level by Ecology. Ecology reviews projects for compliance with state water quality standards and makes permitting and mitigation decisions based on the nature and extent of impacts, as well as the type and quality of wetlands or streams being affected. Activities that use, divert, obstruct, or change the flow of a water of the state, including some wetlands, typically require a Hydraulic Project Approval (HPA) permit. Washington Administrative Code (WAC) Chapter 220-110 regulates water crossing structures and describes requirements for a HPA from WDFW.

The City of Redmond designates and regulates activities within critical areas and their buffers under RZC Article IV, Chapter 21.64. According to RZC 21.64.010(D) (Exceptions), only the Gun Club Creek and Willows Creek culvert replacement elements of the project are subject to Chapter 21.64. The remaining project elements are exempt (RZC 21.64.010[D][1][e]) because they involve reconstruction of an existing road and will not increase impervious area, remove flood storage capacity, or further encroach into a critical area or its buffer. City critical areas requirements applicable to the non-exempt project elements are detailed below.

4.1 Wetlands

As summarized in Table 2-1, the City of Redmond uses the state wetland rating system (Hruby 2014) to classify wetlands (RZC 21.64.030[A]). Wetland buffers are determined based upon wetland category, habitat and water quality functions scores, and intensity of adjacent land use (RZC 21.64.030[B]). According to the “wetland” definition in RZC 21.78, Wetlands C, E, and F are not regulated as critical areas by the City and do not receive a protective buffer because they are constructed stormwater facilities. Ratings and required buffer widths for wetlands within the investigation areas are presented in Table 4-1.

Table 4-1. Wetland Ratings and Required Buffer Widths Specified in RZC 21.64.030(B)

Wetland Name	Wetland Category	Water Quality Function		Buffer Width (ft) ¹
		Score	Habitat Function Score	
A	III	6	4	80
B	III	6	4	80
C	III	7	6	N/A ²
D	III	7	6	150
E	III	6	6	N/A ²
F	IV	6	4	N/A ²

¹ Buffers based upon a “high” intensity of adjacent land use, according to the land use intensity definitions specified in RZC 21.64.030(B)(3).

² Wetland is a constructed stormwater facility (see as-built plans in Appendix E), and is not considered a regulated wetland by the City (see ‘wetland’ definition in RZC 21.78).

Mitigation requirements for wetland alterations are specified in RZC 21.64.030(C). Unavoidable alterations to Category II, III, and IV wetlands are allowed under certain conditions, provided that the proposed alteration and mitigation comply with RZC 21.64.030(C) and will result in no net loss of wetland functions and values. As specified in RZC 21.64.030(C)(8), where permanent wetland alterations are permitted by the City, the applicant is required to restore or create areas of wetlands in accordance with the ratios listed in RZC 21.64.030(C). The RZC does not contain specific mitigation provisions relating to temporary, construction-related impacts to wetlands and buffers.

4.2 Streams

As summarized in Table 2-2, the City of Redmond classifies streams based upon several criteria, such as fish use and flow patterns (perennial or intermittent). In accordance with RZC 21.64.020(A)(2)(d), Gun Club Creek meets Class III stream criteria because it is a non-Shoreline of the State natural stream with non-salmonid fish use. Willows Creek meets Class II stream criteria because it is a non-Shoreline of the State natural stream with salmonid fish use. As specified in RZC 21.63.020(B), stream buffers are determined based upon stream class. Required buffers for streams within the investigation areas are presented in Table 4-2.

Table 4-2. Stream Classifications and Required Buffer Widths according to RZC 21.64.020(B)

Stream Name	Stream Classification	Buffer Width (ft)
Gun Club Creek	III	100
Willows Creek	II	100 + 50 (outer buffer) ¹

¹ Up to 35% of the total 50-foot buffer area may be cleared and graded according to RZC 21.64.020(B)(8). However, no net effective surface may be created within the outer buffer.

As specified in RZC 21.64.020[D][3], culverts are allowed in Class II, III, and IV streams provided that fish passage will not be impaired, WDFW culvert design criteria are used, and the applicant keeps the culvert free of debris and sediment to allow free passage of water and fish. Proposed alterations to riparian stream corridors must meet the performance standards and mitigation requirements specified in RZC 21.64.020[F] and 21.64.020[G].

4.3 Fish and Wildlife Habitat Conservation Areas

City-regulated FWHCAs located within the investigation area vicinities include waters of the state/riparian stream corridors (Gun Club Creek and Willows Creek), areas associated with state priority species (Willows Creek), and core preservation areas (Native Growth Protection Area associated with a wetland area along Willows Creek, just west of Willows Road). Applicable City of Redmond regulations for these habitat types are detailed in Sections 4.1 and 4.2 above.

4.4 Critical Aquifer Recharge Areas

Project construction activities must comply with the groundwater protection specified in RZC 21.64.050(D)(f) and (g). The remaining critical aquifer recharge area regulations detailed in RZC 21.64.050 do not apply to the proposed project because the completed project does not involve storing, handling, treating, using, producing, recycling, or disposing of hazardous materials or other deleterious substances.

4.5 Geologically Hazardous Areas

RZC 21.64.060(E) requires submission of a geotechnical study for projects located within identified geologically hazardous areas. A geotechnical study (GeoEngineers 2018) was prepared, and will be submitted to the City under a different cover.

4.6 Frequently Flooded Areas

There are no identified frequently flooded areas located within the project area; therefore, RZC 21.64.040 does not apply.

5. IMPACT ASSESSMENT

The project will not result in any permanent, adverse impacts to wetlands, FWHCAs (including streams), critical aquifer recharge areas, geologically hazardous areas, frequently flooded areas, or their buffers. Overall, the project will improve stream habitat by replacing two existing fish-barrier culverts with fish-passable structures.

Culvert replacement activities will result in temporary impacts to Gun Club Creek and Willows Creek, as well as Wetlands B, D, and E (Table 5-1).

Table 5-1. Summary of Wetland and Stream Impacts

Wetland/Stream Name	Wetland/Stream		Buffer	
	Permanent Impacts (sq ft)	Temporary Impacts (sq ft)	Permanent Impacts (sq ft)	Temporary Impacts (sq ft)
A	0	0	0	0
B/Gun Club Creek (combined) ¹	0	445	0	405
Gun Club Creek (non-wetland portion) ²	0	75	0	525
C	0	0	0	0
D/Willows Creek (combined) ¹	0	225	0	500
E/Willows Creek (combined) ¹	0	75	0	500
F	0	0	0	0
TOTALS	0	820	0	1,930

¹ Within the temporary impact areas, wetland habitat is located within the stream OHWM.

² There is no associated wetland habitat in the portion of the Gun Club Creek temporary impact area located upstream (west) of Willows Road.

Replacement of Gun Club Creek culvert will require clearing and grading activities within portions of Gun Club Creek, Wetland B, and their respective buffers (Figure 5-1). The disturbance area located at the upstream (west) end of the existing culvert consists of mowed grass and unvegetated stream channel. The disturbance area located at the downstream (east) end of the culvert consists of mowed grass, herbaceous wetland vegetation, and partially vegetated stream channel. No tree or shrub removal is anticipated within the Gun Club Creek impact areas.

Replacement of the Willows Creek culvert will require clearing and grading activities within portions of Willows Creek, Wetland D, Wetland E, and their respective buffers (Figure 5-2). The disturbance areas located at both ends of the existing culvert consist of herbaceous, shrub, and forest wetland and upland habitat, as well as unvegetated stream channel. Approximately 11 trees (primarily red alder) and several shrubs are located within the temporary impact area and will be removed. After construction, the temporarily impacted areas at both culvert replacement locations will be restored with native vegetation (see Section 6).

Some increased turbidity and minor disturbances to the stream substrate of Gun Club Creek and Willows Creek will likely occur during construction. However, impacts will be minimized by the use of erosion and sediment control best management practices (BMPs). Overall, impacts to aquatic organisms will be limited due to the short time period of construction activity and relatively minor magnitude of in-water disturbance activities and associated work (such as fish removal activities). Details on potential impacts to species listed in the Endangered Species Act and associated habitats, along with impact minimization measures, are provided in the project’s Biological Evaluation (Parametrix 2018), provided under separate cover.

Date: 3/23/2018 Path: U:\PSD\Projects\Clients\2577-Tetra Tech\553-2577-018-WillowsRdRestoration\99Svcs\GIS\MXD\Willows_WetlandsStreams.mxd



Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

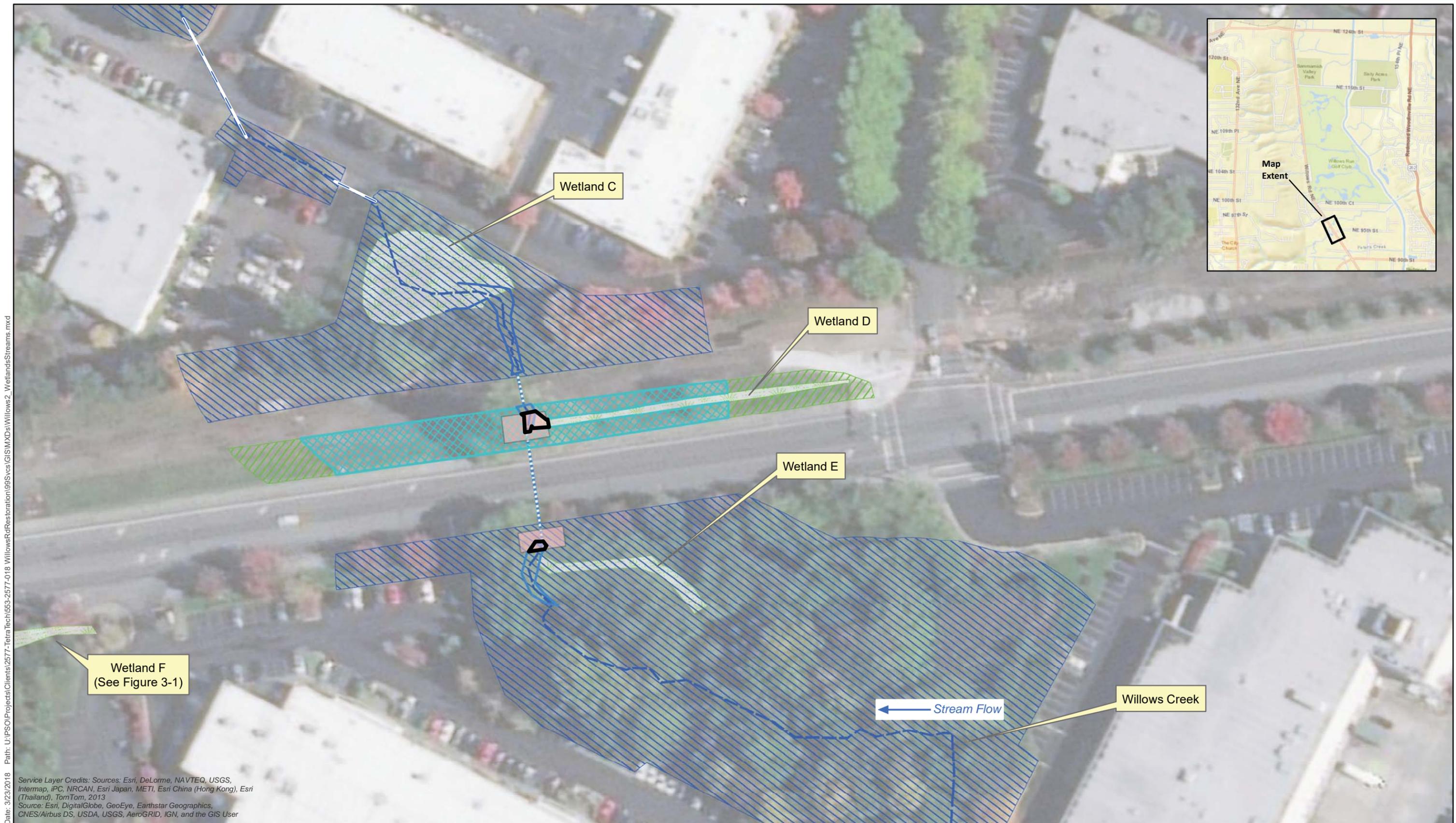
Parametrix



- Wetland
- Stream OHWM
- Stream
- Combined Wetland/Stream Buffer
- Clearing and Grading Limits
- Wetland Buffer
- Stream Buffer
- Stream in Culvert
- Temporary Wetland/Stream Impacts

Figure 5-1. Project Impacts: Gun Club Creek Vicinity
Willows Road Restoration Project

Redmond, Washington



Path: U:\PSO\Projects\Clients\2577-Tetra Tech\553-2577-018_WillowsRdRestoration\99Svcs\GIS\MXD\Willows2_WetlandsStreams.mxd
 Date: 3/23/2018
 Service Layer Credits: Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

Parametrix

0 40 80 160 Feet

- Wetland
- Stream OHWM
- Stream
- Combined Wetland/Stream Buffer
- Clearing and Grading Limits
- Wetland Buffer
- Stream Buffer
- Stream in Culvert
- Temporary Wetland/Stream Impacts

Figure 5-2. Project Impacts: Willows Creek Vicinity
 Willows Road Restoration Project
 Redmond, Washington

6. CONCEPTUAL MITIGATION PLAN

Overall, the project will result in a net improvement to City-regulated critical areas by replacing two existing fish-barrier stream culverts with fish-passable structures. In accordance with the mitigation sequencing requirements of RZC 21.64.010(I), the project was designed to avoid permanent impacts to critical areas. Temporary impacts to wetland, stream, and buffer habitats cannot be completely avoided, but will be limited to the minimum necessary to remove and replace the Gun Club Creek and Willows Creek culverts. Following construction, all temporarily impacted wetland, riparian, and buffer habitat areas will be restored to equal or better condition. Following restoration, the sites will be monitored in accordance with the requirements of RZC 21.64.010(P). Existing unvegetated stream channel areas will be restored to pre-construction conditions, or as required by the project's HPA.

6.1 Goals and Objectives

The overall goal of the restoration plan is to replant a total of 600 square feet of temporarily impacted riparian, wetland, and buffer habitat (see planting plan in Appendix F). This goal will be achieved by removing any temporary fill after construction and replanting the area at a one-to-one ratio (disturbance area to restoration areas).

Specific objectives to reach this goal include the following:

- Increasing the cover and diversity of native trees and shrubs in the temporarily impacted riparian, wetland, and buffer habitats
- Limiting invasive plant cover

6.2 Performance Criteria

A set of specific performance standards has been established to correspond with the stated restoration objectives. These standards serve as benchmarks that will be used to evaluate the success of the restoration project. By monitoring the mitigation project and comparing the results to performance standards, a determination will be made as to the need for implementing a contingency plan. The performance standards are as follows:

Year 1:

- Planted woody species in the wetland/riparian and buffer restoration areas will achieve 100 percent survival. If all dead woody plantings are replaced, the performance measure will be met.
- Invasive species such as non-native blackberry and Class B noxious weeds will occupy no more than 10 percent of the restoration areas.
- Class A noxious weeds, Japanese knotweed (*Polygonum cuspidatum*), and knotweed hybrids will be absent after Year 1 in the restoration areas.

Year 3:

- Native woody cover in the wetland/riparian and buffer restoration areas will be equal to or greater than 50 percent aerial coverage.
- Invasive species such as non-native blackberry and Class B noxious weeds will occupy no more than 10 percent of the restoration areas.
- Class A noxious weeds, Japanese knotweed, and knotweed hybrids will be absent after Year 3 in the restoration areas.

Year 5:

- Native woody cover in the wetland/riparian and buffer restoration areas will be equal to or greater than 80 percent aerial coverage.
- Invasive species such as non-native blackberry and Class B noxious weeds will occupy no more than 10 percent of the restoration areas.
- Class A noxious weeds, Japanese knotweed, and knotweed hybrids will be absent after Year 5 in the restoration areas.

6.3 Monitoring

The restoration areas will be monitored over a period of no less than 5 years, in accordance with the requirements of RZC 21.64.010(P). Details for monitoring of the restoration sites are outlined below.

6.3.1 Methods

The main objective of monitoring is to document the level of success in meeting the interim performance standards and the final success standards. Monitoring will be conducted by a qualified wetland and/or stream biologist and will begin the first full growing season after construction is completed and the plants have been installed. The biologist will perform a general walkthrough of the site and document the percent survival.

Survival of plantings will be based on comparisons with as-built drawings. Data documenting plant survival and health will be collected each time the site is monitored. Photographs will be taken to document conditions during that monitoring year.

Invasive and native plant cover will be assessed using line-intercept evaluations of established transects through the site.

6.3.2 Reporting

Monitoring reports will address the items presented in the preceding section, as well as document plant survival success and problems, if any. The reports will recommend plant species replacements, if necessary. Photographs will be included to document existing site conditions. In accordance with RZC 21.64.010(P)(3)(d), the Year 1 report will be produced 30 days after plantings, and two Year 2 reports will be produced (one early in the growing season and another at the end of the growing season). In Years 3 through 5, reports will be produced annually, at the end of the growing season.

6.4 Contingency Plan

The City of Redmond will implement a contingency plan if the restoration areas fail to meet the stated performance criteria. Contingency plans are prepared on a case-by-case basis, depending upon the mitigation aspect that does not meet the goals and objectives of the plan.

7. REFERENCES

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Appendix A

Background Information





WASHINGTON DEPARTMENT OF FISH AND WILDLIFE PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPublic
REPORT DATE: 01/16/2018 1.50

Query ID: P180116134939

Common Name	Site Name	Priority Area	Accuracy	Federal Status	Sensitive Data	Source Entity
Scientific Name	Source Dataset	Occurrence Type		State Status	Resolution	Geometry Type
Notes	Source Record	More Information (URL)		PHS Listing Status		
	Source Date	Mgmt Recommendations				
Chinook	Sammamish River	Occurrence	NA	Threatened	N	WDFW Fish Program
Oncorhynchus tshawytscha	SASI	Occurrence		N/A	AS MAPPED	Lines
	1128	http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS Listed		
		http://wdfw.wa.gov/publications/pub.php?				
Coho	SWIFD	Breeding Area	NA	N/A	N	
Oncorhynchus kisutch	31965	Breeding area		N/A	AS MAPPED	Lines
		http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS LISTED		
		http://wdfw.wa.gov/publications/pub.php?				
Coho	SWIFD	Breeding Area	NA	N/A	N	
Oncorhynchus kisutch	31966	Breeding area		N/A	AS MAPPED	Lines
		http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS LISTED		
		http://wdfw.wa.gov/publications/pub.php?				
Coho	SWIFD	Breeding Area	NA	N/A	N	
Oncorhynchus kisutch	32002	Breeding area		N/A	AS MAPPED	Lines
		http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS LISTED		
		http://wdfw.wa.gov/publications/pub.php?				
Coho	SWIFD	Breeding Area	NA	N/A	N	
Oncorhynchus kisutch	32003	Breeding area		N/A	AS MAPPED	Lines
		http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS LISTED		
		http://wdfw.wa.gov/publications/pub.php?				
Coho	SWIFD	Breeding Area	NA	N/A	N	
Oncorhynchus kisutch	32247	Breeding area		N/A	AS MAPPED	Lines
		http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS LISTED		
		http://wdfw.wa.gov/publications/pub.php?				
Coho	SWIFD	Breeding Area	NA	N/A	N	
Oncorhynchus kisutch	32669	Breeding area		N/A	AS MAPPED	Lines
		http://wdfw.wa.gov/wlm/diversty/soc/soc.htm		PHS LISTED		
		http://wdfw.wa.gov/publications/pub.php?				

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Coho Oncorhynchus kisutch	SWIFD 32728	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Coho Oncorhynchus kisutch	SWIFD 32811	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Coho Oncorhynchus kisutch	SWIFD 32894	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Coho Oncorhynchus kisutch	SWIFD 33215	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Coho Oncorhynchus kisutch	Sammamish River SWIFD 39960	Breeding Area Breeding area http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Coho Oncorhynchus kisutch	SASI 3120	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	Candidate N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Coho Oncorhynchus kisutch	SASI 3120	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	Candidate N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Coho Oncorhynchus kisutch	SASI 3120	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	Candidate N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Coho Oncorhynchus kisutch	SASI 3120	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	Candidate N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Coho Oncorhynchus kisutch	Sammamish River SASI 3120	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	Candidate N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Dolly Varden/ Bull Trout Salvelinus malma	Sammamish River SWIFD 39961	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Fall Chinook Oncorhynchus tshawytscha	SWIFD 32727	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Fall Chinook Oncorhynchus tshawytscha	Sammamish River SWIFD 39957	Breeding Area Breeding area http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Freshwater Emergent	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Emergent	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Emergent	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons

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

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

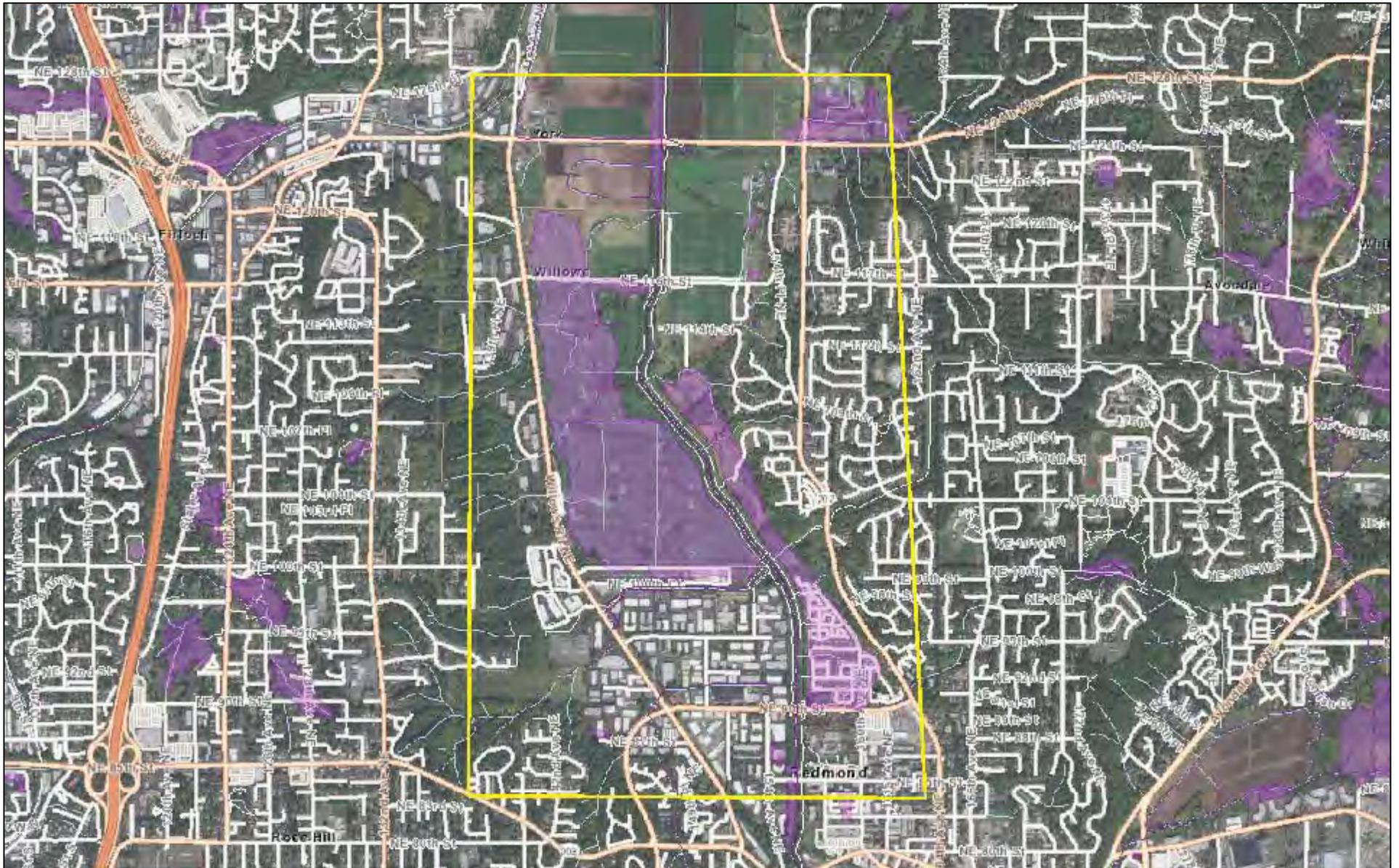
Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Freshwater Forested/Shrub	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.gov	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Forested/Shrub	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.gov	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Forested/Shrub	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.gov	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Freshwater Forested/Shrub	N/A NWIWetlands	Aquatic Habitat Aquatic habitat http://www.ecy.wa.gov	NA	N/A N/A PHS Listed	N AS MAPPED	US Fish and Wildlife Service Polygons
Kokanee Oncorhynchus nerka	SWIFD 32729	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Kokanee Oncorhynchus nerka	Sammamish River SWIFD 39964	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Rainbow Trout Oncorhynchus mykiss	Sammamish River SWIFD 39966	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Resident Coastal Cutthroat Oncorhynchus clarki	SWIFD 32245	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Resident Coastal Cutthroat Oncorhynchus clarki	SWIFD 32719	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Resident Coastal Cutthroat Oncorhynchus clarki	SWIFD 32726	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Resident Coastal Cutthroat Oncorhynchus clarki	SWIFD 33762	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Resident Coastal Cutthroat Oncorhynchus clarki	Sammamish River SWIFD 39955	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Sockeye Oncorhynchus nerka	SWIFD 32722	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Sockeye Oncorhynchus nerka	SWIFD 32730	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Sockeye Oncorhynchus nerka	SWIFD 33765	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Sockeye Oncorhynchus nerka	Sammamish River SWIFD 39967	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Sockeye Oncorhynchus nerka	Sammamish River SASI 5200	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm http://wdfw.wa.gov/publications/pub.php?	NA	Not Warranted N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Steelhead Oncorhynchus mykiss	Sammamish River SASI 6154	Occurrence Occurrence http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	Threatened N/A PHS Listed	N AS MAPPED	WDFW Fish Program Lines
Wetlands	SAMMAMISH RIVER PHSREGION 902534	Aquatic Habitat N/A http://www.ecy.wa	1/4 mile (Quarter	N/A N/A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons
Winter Steelhead Oncorhynchus mykiss	SWIFD 31969	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Winter Steelhead Oncorhynchus mykiss	SWIFD 32724	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Winter Steelhead Oncorhynchus mykiss	SWIFD 32731	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Winter Steelhead Oncorhynchus mykiss	SWIFD 33766	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines
Winter Steelhead Oncorhynchus mykiss	Sammamish River SWIFD 39968	Occurrence/Migration Occurrence/migration http://wdfw.wa.gov/wlm/diversty/soc/soc.htm	NA	N/A N/A PHS LISTED	N AS MAPPED	Lines

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.

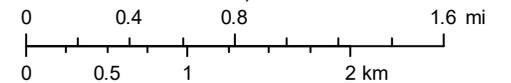
WDFW Test Map



January 16, 2018

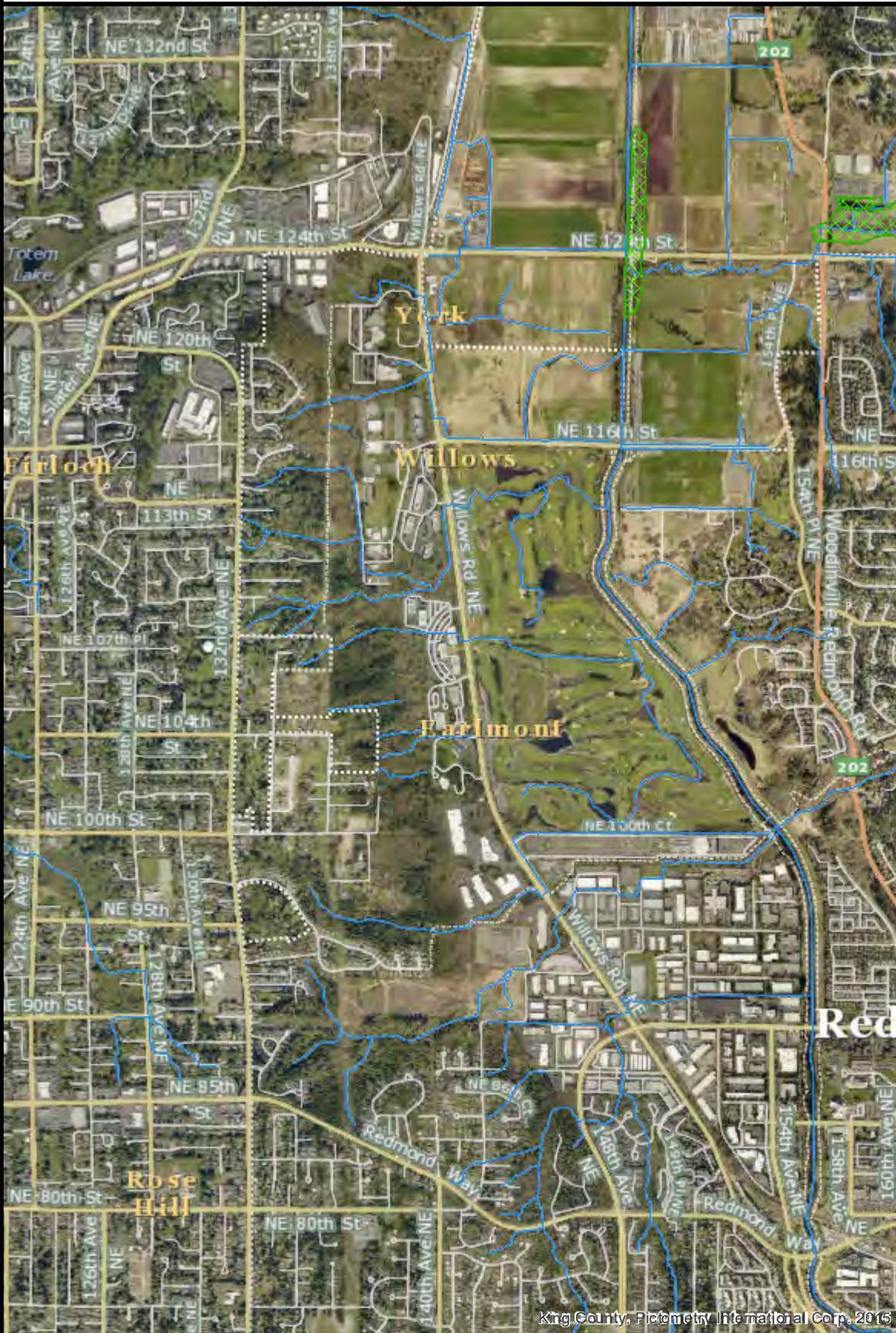
- | | | | | | |
|---|----------------------|---|-------------|---|----------|
|  | PHS Report Clip Area |  | POLY |  | QTR-TWP |
|  | PT |  | AS MAPPED |  | TOWNSHIP |
|  | LN |  | SECTION | | |

1:46,368



Washington Fish and Wildlife
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

King County iMap



Legend

-  Wetland (1990 SAO)
-  Streams

King County, Pictometry International Corp. 2015

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.



 **King County**
GIS CENTER

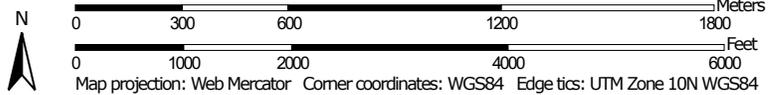
Date: 1/16/2018

Notes:

Soil Map—King County Area, Washington
(Willows Rd)



Map Scale: 1:21,200 if printed on A portrait (8.5" x 11") sheet.



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



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

-  Spoil Area
-  Stony Spot
-  Very Stony Spot
-  Wet Spot
-  Other
-  Special Line Features

Water Features

 Streams and Canals

Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

Background

 Aerial Photography

MAP INFORMATION

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

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 13, Sep 7, 2017

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

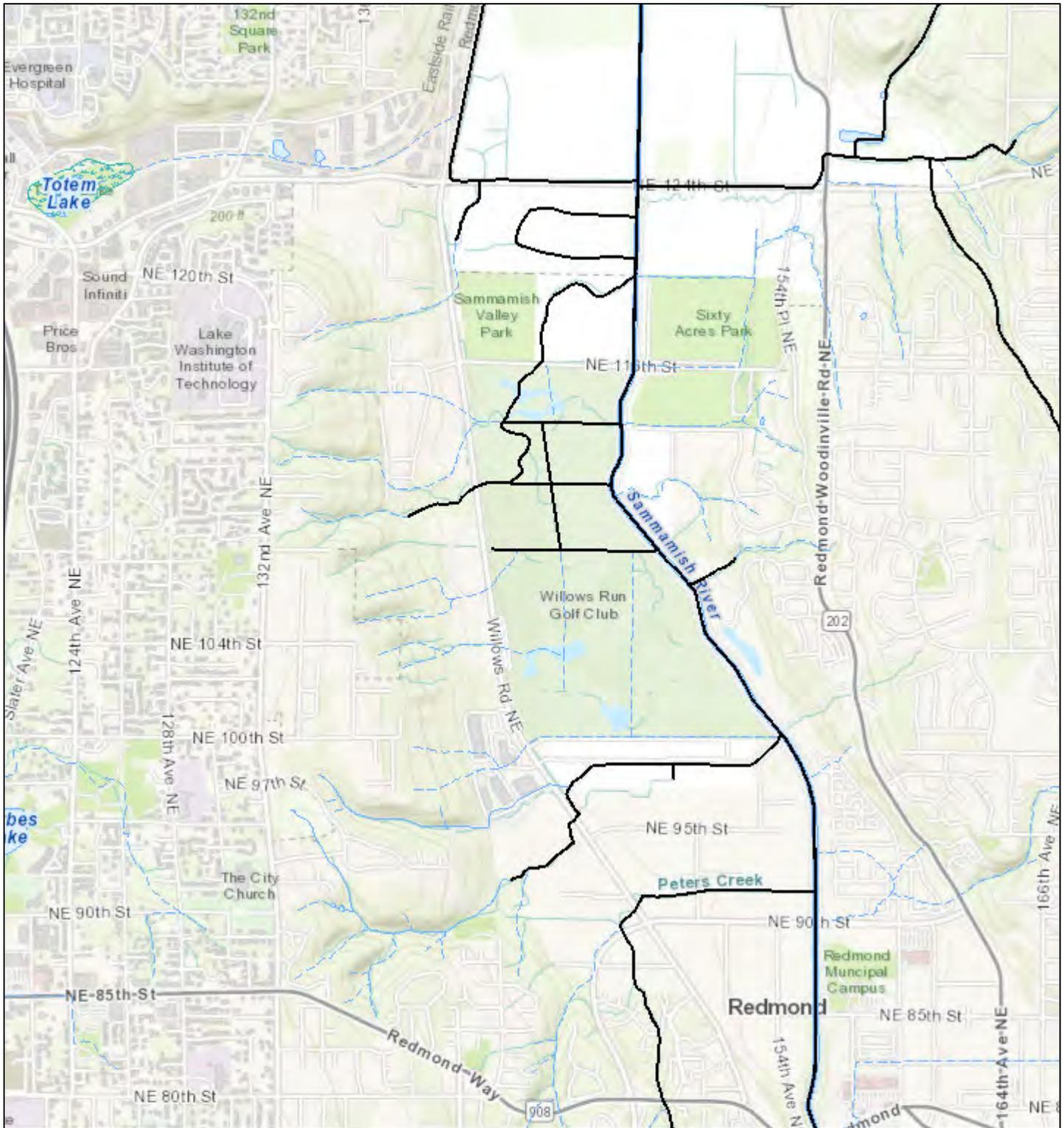
Date(s) aerial images were photographed: Aug 31, 2013—Oct 6, 2013

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

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AgC	Alderwood gravelly sandy loam, 8 to 15 percent slopes	113.2	21.5%
AgD	Alderwood gravelly sandy loam, 15 to 30 percent slopes	17.9	3.4%
Ea	Earlmont silt loam	52.2	9.9%
InA	Indianola loamy sand, 0 to 5 percent slopes	157.4	29.9%
KpB	Kitsap silt loam, 2 to 8 percent slopes	18.0	3.4%
Sr	Snohomish silt loam, thick surface variant	0.1	0.0%
Tu	Tukwila muck	167.8	31.9%
Totals for Area of Interest		526.6	100.0%

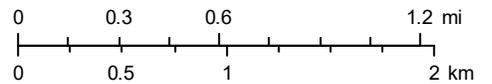
Willows Rd



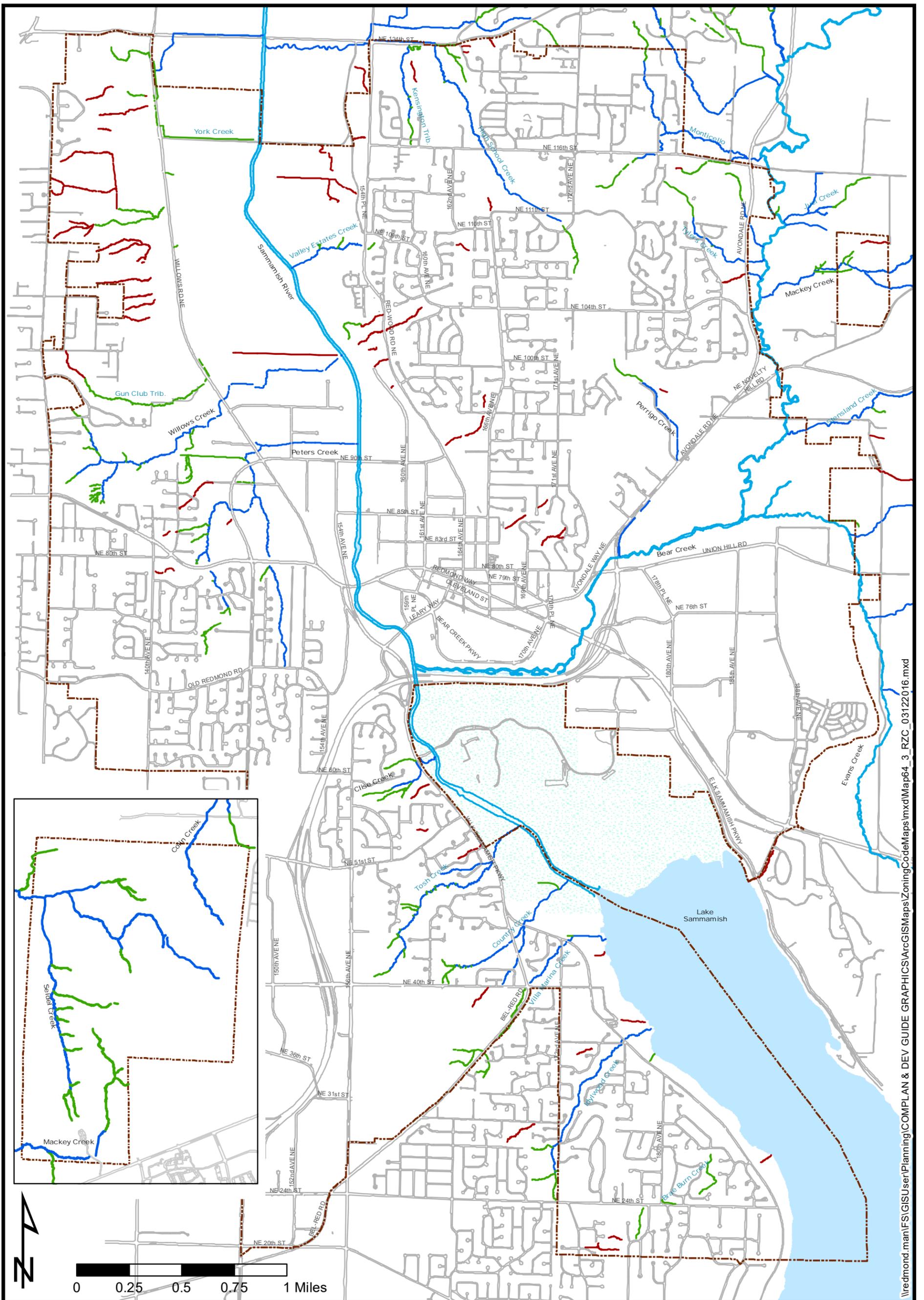
January 17, 2018

1:36,112

— All SalmonScape Species



USGS/NHD
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



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 **City of Redmond**

Critical Areas Map
Effective: 3/12/2016

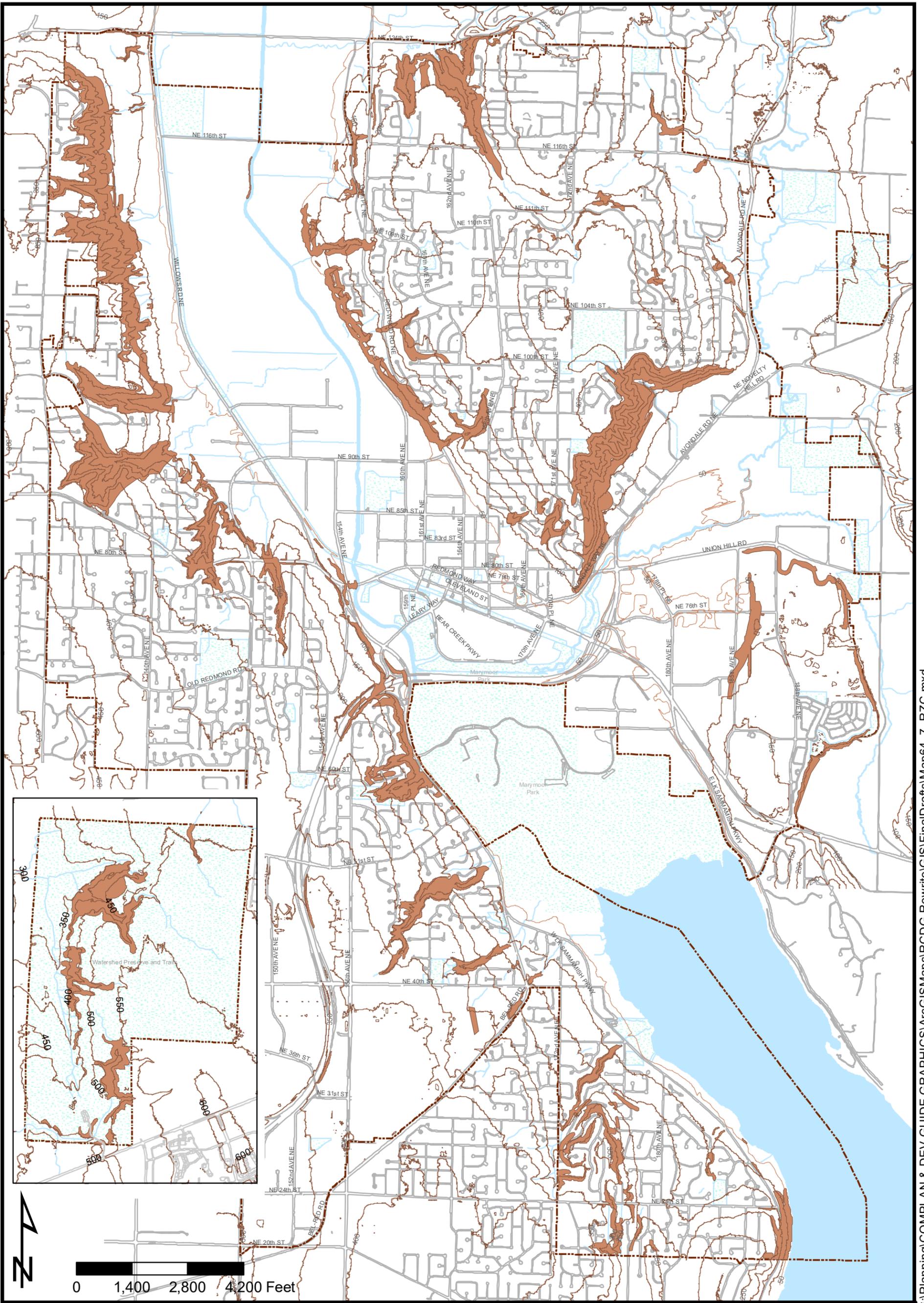
Map 64.3 Streams Classification

Stream Official USGS Stream Name
 Stream Informal Stream Name

- Class I Stream
- Class II Stream
- Class III Stream
- Class IV Stream

Sources:
 City of Redmond Public Works, Natural Resources Division
 City of Redmond GIS Services
 Washington Trout / Wild Fish Conservancy
 King County GIS

Note: This map shall be used as a general guide representing the approximate location of streams, per RZC 21.64.010(E)(2). The map does not necessarily ensure the presence or absence of streams. In the event of a conflict between the map and the criteria of the Critical Areas Ordinance (CAO), the criteria shall prevail. Consult the CAO (RZC 21.64) for reporting requirements
 Note: Gaps in illustrated streams may indicate culverts, pipes, etc.
 Note: Informal stream names may not conform to USGS policies and may change in the future.



G:\Planning\COMPLAN & DEV GUIDE GRAPHICS\ArcGIS\Maps\RCDG Rewrite\GIS\FinalDrafts\Map64_7_RZC.mxd



City of Redmond

*Critical Areas Map
Effective: 03/12/2016*

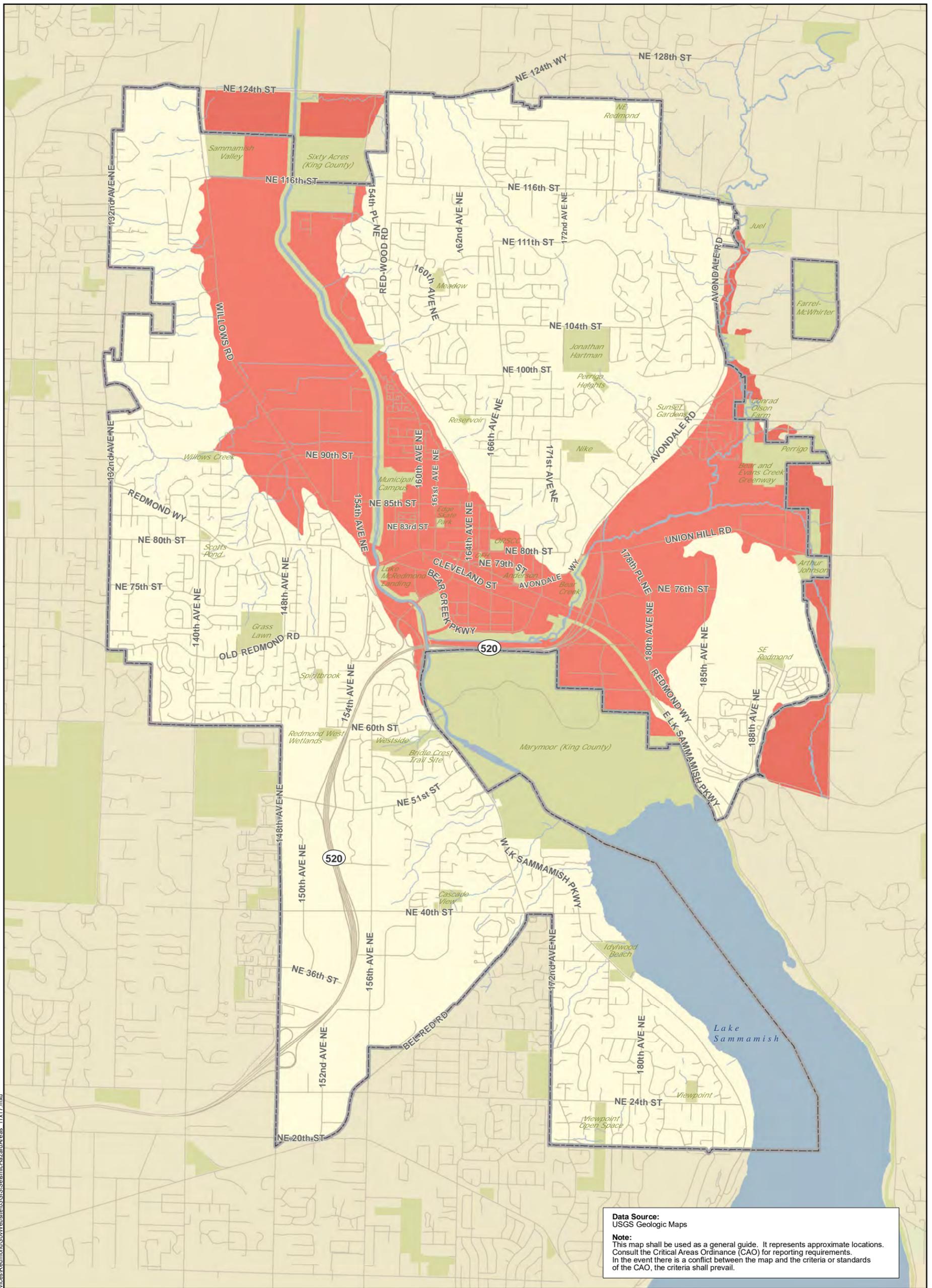
Map 64.7 Landslide Hazards

Legend

- Landslide Hazards Areas
- Contours
- Park

Sources:
City of Redmond GIS Services
King County GIS

Note: This map shall be used as a general guide representing the approximate location of steep slopes, per RZC 21.64.060(A)(1)b.vii. The map does not necessarily ensure the presence or absence of landslide hazards. In the event of a conflict between the map and the criteria of the Critical Areas Ordinance (CAO), the criteria shall prevail. Consult the CAO (RZC 21.64) for reporting requirements.



Seismic Hazard Areas

Critical Areas Map

City of Redmond, Washington

Effective: 05/28/2005



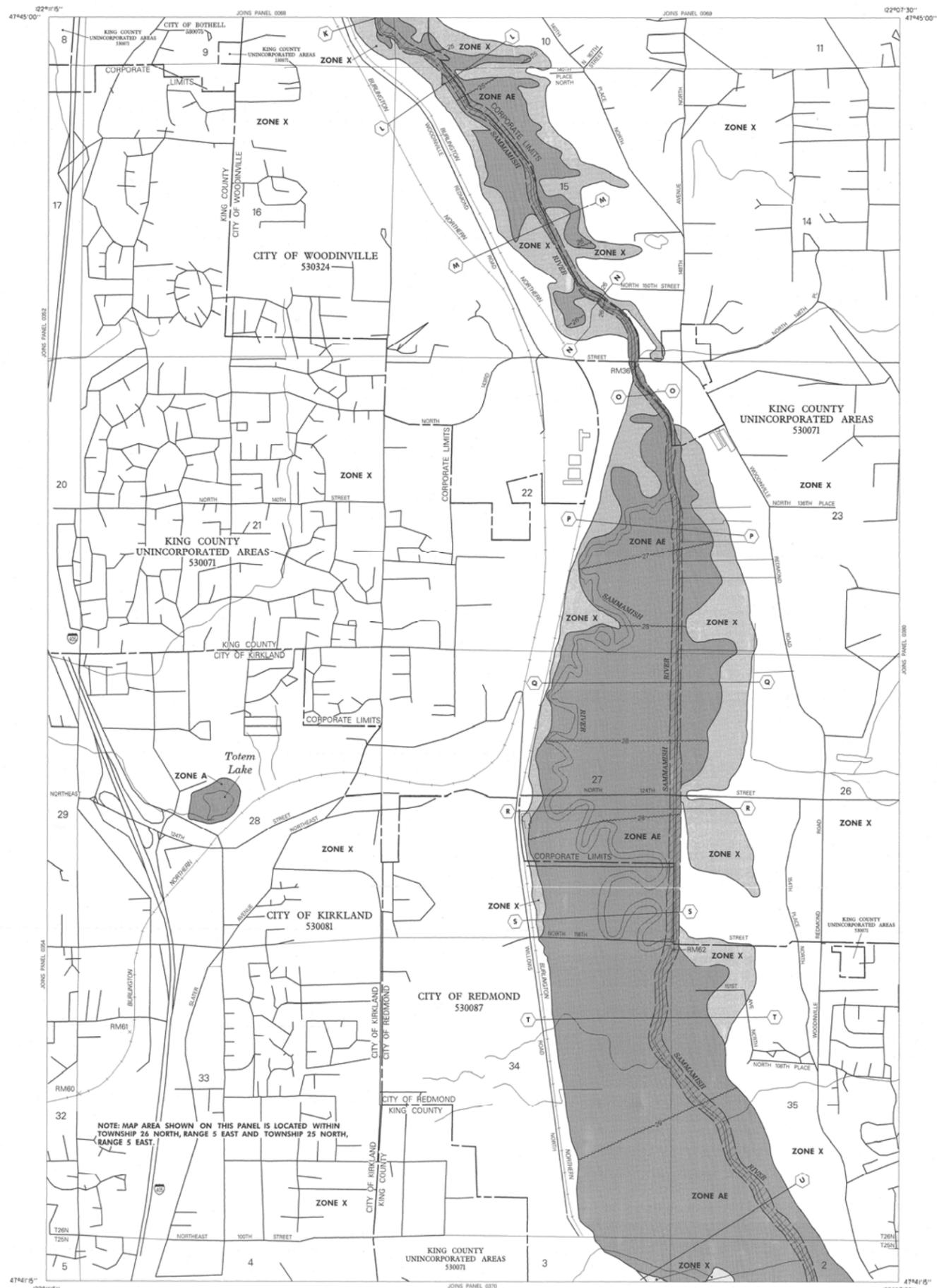
- | | | | |
|---|---------------------|---|---------------------|
|  | Seismic Hazard Area |  | Park and Open Space |
|  | City Limit |  | Water |

Disclaimer: This map is created and maintained by GIS Services Group, Finance and Information Services, City of Redmond, Washington, for reference purposes only.

The City makes no guarantee as to the accuracy of the features shown on this map.

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NAVD)	DESCRIPTION OF LOCATION
RM36	38.78	PPS-9-A chiseled X on the lower bridge rail on the upstream side and center of 145th Street Northwest Bridge.
RM60	145.08	Located in the City of Kirkland, a railroad spike 2 inches up on the east side of a power pole on the west side of 116th Avenue NE (extended), approximately 150 feet south of intersection of 116th Avenue NE and NE 108th Street. Established by Horton, Dennis, and Associates.
RM61	162.97	Located in the City of Kirkland, a railroad spike 2 inches up on a power pole on the north side of NE 112th Street, approximately 100 feet west of Burlington Northern Railroad tracks and approximately 900 feet east of intersection of 116th Avenue NE and NE 112th Street. Established by Horton, Dennis, and Associates.
RM62	39.04	NE 116th Street Bridge. Chiseled cross, top upstream curb on bridge near middle of bridge.



NOTE: MAP AREA SHOWN ON THIS PANEL IS LOCATED WITHIN TOWNSHIP 26 NORTH, RANGE 5 EAST AND TOWNSHIP 25 NORTH, RANGE 5 EAST.

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATE
BY 100-YEAR FLOOD

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet usually areas of ponding; base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet usually sheet flow on sloping terrain; average depths determined for areas of ponding; velocities also determined.
- ZONE APF** To be protected from 100-year flood by Federal Flood Protection System under construction; no base flood elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X** Area of 500-year flood area of 100-year flood with average depths of less than 1 foot or with drainage area less than 1 square mile; and area protected by levees from 100-year flood.

OTHER AREAS

- ZONE X** Area determined to be outside 500-year floodplain.
- ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

- Identified 1992
- Identified 1993
- Other/Not Protected Area

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Boundary Lines

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

Base Flood Elevation Line: Elevation in Feet. See Map Index for Elevation Datum.

Cross Section Line: (E1, S87)

Base Flood Elevation in Feet Where Location Within Zone: See Map Index for Elevation Datum.

Elevation Reference Mark: RM7

River Mile: M2

Horizontal Coordinates: Based on North American Datum of 1927 (NAD 27) Projection.

91°07'30", 32°52'30"

NOTES

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all phenomena, features outside Special Flood Hazard Areas. The community map repository should be contacted for more detailed data on FEMA and for any information on floodway determinations, prior to use of this map for property purchase or construction purposes.

Areas of Special Flood Hazard 100-year flood include Zones A, AE, AH, AO, APF, AP, V, VE and VI-VI2.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 120 inch.

Coastal base flood elevations apply only to landward of E.D. NAVD, and include the effects of wave action. These elevations may also differ significantly from those determined by the National Weather Service for hurricane evacuation planning.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and for Other/Not Protected Areas established under the Coastal Barrier Improvement Act of 1980 (P.L. 96-350).

For community map revision history prior to countywide mapping, see Section 4.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP:
SEPTEMBER 26, 1989

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
MAY 16, 1995

Revised November 8, 1999 to update corporate limits to change base flood elevations to those of special flood hazard areas to add roads and real names to incorporate previously issued letter of map revision, and to change floodway.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at 800-638-6622.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM FLOOD INSURANCE RATE MAP

KING COUNTY, WASHINGTON AND INCORPORATED AREAS

PANEL 360 OF 1725
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTROLLING COMMUNITY	NUMBER	PANEL	SUFFIX
BOTHELL, CITY OF	530076	0360	0
KIRKLAND, CITY OF	530077	0360	0
REDMOND, CITY OF	530078	0360	0
WOODINVILLE, CITY OF	530079	0360	0
KING COUNTY UNINCORPORATED AREAS	530071	0360	0

MAP NUMBER 53033C0360 G

MAP REVISED: NOVEMBER 8, 1999

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS
REFERENCE ELEVATION
MARK (FEET MVD) DESCRIPTION OF LOCATION

RM69	48.14	Wood and steel railroad bridge downstream of 80th Place bridge. A boat spike set in riverbed side of downstream piling to right bank abutment at Burlington Northern Railroad Bridge.
RM70	42.29	Leary Way Bridge, chiseled "V" in concrete curb at upstream side of center of bridge.



THIS AREA IS SHOWN ON MAP NUMBER 53033C0368

THIS AREA IS SHOWN ON MAP NUMBER 53033C0369

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain; average depths determined; for areas of about fan flooding, velocity also determined).
- ZONE AP** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V** Coastal flood with velocity based levee action; no base flood elevations determined.
- ZONE VE** Coastal flood with velocity based levee action; base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X** Area of 100-year flood area of 100-year flood with average depths of less than 1 foot or with drainage area less than 1 square mile and area protected by levees from 100-year flood.

OTHER AREAS

- ZONE X** Area determined to be outside 100-year floodplain.
- ZONE D** Area in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

- Identified 1987
- Identified
- Otherwise Protected Area

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Flood Boundary
Floodway Boundary
Zone D Boundary
Boundary Dividing Special Flood Hazard Zones and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones
Base Flood Elevation Line: Elevation in Feet. See Map Index for Elevation Datum.
Cross Section Line
Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.
Elevation Reference Mark
River Mile
Horizontal Coordinates Based on North American Datum of 1983 (NAD 83) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all parametric features outside Special Flood Hazard Areas.

Coastal base flood elevations apply only landward of 0.0 MVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of Special Flood Hazard (100-year floods) include Zones A, AE, AH, AO, AP, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and/or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1982 (P.L. 97-502). Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For community map revision history prior to county-wide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
SEPTEMBER 29, 1989

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
Revised May 16, 1995 to update map format.

To determine if flood insurance is available contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

KING COUNTY,
WASHINGTON AND
INCORPORATED AREAS

PANEL 370 OF 1725
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COUNTY	COMMUNITY	NUMBER	PANEL	SUFFIX
BELLEVUE CITY OF	KING COUNTY	53074	0370	F
UNINCORPORATED AREAS	KING COUNTY	53075	0370	F
KIRKLAND CITY OF	KING COUNTY	53076	0370	F
REDMOND CITY OF	KING COUNTY	53077	0370	F

MAP NUMBER
53033C0370 F

MAP REVISED:
MAY 16, 1995

Federal Emergency Management Agency

Appendix B

Site Photos





Photo 1. Wetland A/Gun Club Tributary, view northeast from north of NE 100th Court.



Photo 2. Wetland B/Gun Club Tributary, view southwest from south of NE 100th Court.



Photo 3. Wetland C/Willows Creek, view north from approximately 50 feet east of the Redmond Central Connector Trail.



Photo 4. Wetland D, view northwest from approximately 50 feet north of NE 95th Street.



Photo 5. Wetland E, view southeast from approximately 50 feet south of Willows Creek.



Photo 6. Wetland F, view northwest from approximately 100 feet south of Gun Club Tributary.



Photo 7. Gun Club Tributary, view northeast from the 9845 Willows Road office building driveway



Photo 8. Willows Creek stream channel immediately upstream (southwest) of Willows Road, view southwest.



Photo 8. Section of Willow Creek stream channel between Willows Road and the Redmond Central Connection Trail, view southwest from trail. Edge of recently-replaced trail culvert visible in foreground.

Appendix C

Wetland Data Sheets



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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 1(WET)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 2-4
 Subregion (LRR): A Lat: 47.688888 Long: -122.148749 Datum: WGS-84
 Soil Map Unit Name: Earlmont Silt Loam NWI classification: R4SBC

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The SP is positioned adjacent to Gunclub Creek within a confined ditch-like swale. The wetland boundary is defined by the edge of fill. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
				0 _____ = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
				0 _____ = Total Cover
<u>Herb Stratum</u> (Plot size: <u>r=1m</u>)				
1. <u>Juncus balticus</u>	40	Yes	FACW	
2. <u>Phalaris arundinacea</u>	30	Yes	FACW	
3. <u>Epilobium sp.</u>	Trace	No	--	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
				70 _____ = Total Cover
<u>Woody Vine Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>				
2. _____				
				0 _____ = Total Cover
<u>% Bare Ground in Herb Stratum</u> <u>15</u>				

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

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

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: 1(WET)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-8	10YR 3/1	100					Gr SL	
8-16+	5Y 5/1	85	7.5YR 3/4	5	C	PL	CL	
			10YR 3/1	10	C	M		
¹ Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. ² Location: PL=Pore Lining, M=Matrix.								
Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)						Indicators for Problematic Hydric Soils³:		
<input type="checkbox"/> Histosol (A1)			<input type="checkbox"/> Sandy Redox (S5)			<input type="checkbox"/> 2 cm Muck (A10)		
<input type="checkbox"/> Histic Epipedon (A2)			<input type="checkbox"/> Stripped Matrix (S6)			<input type="checkbox"/> Red Parent Material (TF2)		
<input type="checkbox"/> Black Histic (A3)			<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)			<input type="checkbox"/> Very Shallow Dark Surface (TF12)		
<input type="checkbox"/> Hydrogen Sulfide (A4)			<input type="checkbox"/> Loamy Gleyed Matrix (F2)			<input type="checkbox"/> Other (Explain in Remarks)		
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)			<input type="checkbox"/> Depleted Matrix (F3)			³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.		
<input type="checkbox"/> Thick Dark Surface (A12)			<input type="checkbox"/> Redox Dark Surface (F6)					
<input type="checkbox"/> Sandy Mucky Mineral (S1)			<input type="checkbox"/> Depleted Dark Surface (F7)					
<input type="checkbox"/> Sandy Gleyed Matrix (S4)			<input type="checkbox"/> Redox Depressions (F8)					
Restrictive Layer (if present):						Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Type: _____								
Depth (inches): _____								
Remarks:								

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input checked="" type="checkbox"/> Surface Water (A1)		<input type="checkbox"/> Water-Stained Leaves (B9) (except MLRA 1, 2, 4A, and 4B)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input checked="" type="checkbox"/> High Water Table (A2)		<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Saturation (A3)		<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)		<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)		<input checked="" type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)		<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)		<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)		<input type="checkbox"/> Stunted or Stressed Plants (D1) (LRR A)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)		<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)			
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)			
Field Observations:		Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Surface Water Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>+0.5"</u>	
Water Table Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0"; (surface)</u>	
Saturation Present? (includes capillary fringe)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Depth (inches): <u>0"; (surface)</u>	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: Below OHWM			

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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 2(UPL)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 70
 Subregion (LRR): A Lat: 47.688888 Long: -122.148749 Datum: WGS-84
 Soil Map Unit Name: Earlmont silt loam NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The SP is located above the OHWM for Gunclub Creek on the edge of an old railroad prism. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
	<u>0</u>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
	<u>0</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>r=1m</u>)				
1. <u>Hypochaeris radicata</u>	<u>50</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Phalaris arundinacea</u>	<u>10</u>	<u>No</u>	<u>FACW</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>60</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>				
2. _____				
	<u>0</u>	= Total Cover		
<u>% Bare Ground in Herb Stratum</u> <u>40</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 1 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

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

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)

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

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

Remarks:

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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 3(WET)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 3-5
 Subregion (LRR): A Lat: 47.687885 Long: -122.147805 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: R4SBC

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The SP is positioned upslope from where Gunclub Creek flows out of the culvert. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
				<u>0</u> = Total Cover
<u>Sapling/Shrub Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
				<u>0</u> = Total Cover
<u>Herb Stratum</u> (Plot size: <u>r=1m</u>)				
1. <u>Phalaris arundinacea</u>	<u>80</u>	<u>Yes</u>	<u>FACW</u>	
2. <u>Nasturtium officinale</u>	<u>15</u>	<u>No</u>	<u>OBL</u>	
3. <u>Poa sp.</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
				<u>100</u> = Total Cover
<u>Woody Vine Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>				
2. _____				
				<u>0</u> = Total Cover
% Bare Ground in Herb Stratum <u>0</u>				

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

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

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 4(UPL)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 60
 Subregion (LRR): A Lat: 47.687885 Long: -122.147805 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The SP is located on the road fill prism for Willows Road and is positioned above Gunclub Creek's OHWM and Wetland B. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
	<u>0</u>	= Total Cover		
Sapling/Shrub Stratum	(Plot size: <u>r=2m</u>)			
1. <u>Tsuga heterophylla (s)</u>	<u>10</u>	<u>Yes</u>	<u>FACU</u>	
2. <u>Rubus armeniacus</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
	<u>13</u>	= Total Cover		
Herb Stratum	(Plot size: <u>r=1m</u>)			
1. <u>Phalaris arundinacea</u>	<u>90</u>	<u>Yes</u>	<u>FACW</u>	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>90</u>	= Total Cover		
Woody Vine Stratum	(Plot size: <u>r=2m</u>)			
1. <u>none</u>				
2. _____				
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>5</u>				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

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

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks: Tsuga heterophylla is planted as a buffer enhancement.

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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 5(WET)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): 1-3
 Subregion (LRR): A Lat: 47.686537 Long: -122.146004 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: PUHBx

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The SP is located where Willows Creek ponds behind the downstream undersized culvert. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: r=3m)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>20</u>	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</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)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
_____	<u>20</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: r=2m)				
1. <u>Rubus spectabilis</u>	<u>4</u>	Yes	FAC	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Rubus armeniacus</u>	<u>3</u>	Yes	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____	<u>7</u>	= Total Cover		
Herb Stratum (Plot size: r=1m)				
1. <u>Ranunculus repens</u>	<u>50</u>	Yes	FAC	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Scirpus microcarpus</u>	<u>5</u>	No	OBL	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____	<u>55</u>	= Total Cover		
Woody Vine Stratum (Plot size: r=2m)				
1. _____	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
_____	<u>none</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>20</u>				

Remarks: leaf litter duff

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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 6(UPL)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 2-3
 Subregion (LRR): A Lat: 47.686537 Long: -122.146004 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The SP is positioned on a bench above SP-5(WET). WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status		
Tree Stratum (Plot size: r=3m)					
1. <u>none</u>				Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A) Total Number of Dominant Species Across All Strata: <u>6</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)	
2. _____					
3. _____					
4. _____					
	<u>0</u>	= Total Cover			
Sapling/Shrub Stratum (Plot size: r=2m)					
1. <u>Rubus armeniacus</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____	
2. <u>Rubus spectabilis</u>	<u>3</u>	<u>Yes</u>	<u>FAC</u>		
3. _____					
4. _____					
5. _____					
	<u>8</u>	= Total Cover			
Herb Stratum (Plot size: r=1m)					
1. <u>Ranunculus repens</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>		
2. <u>Poa pratensis</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>		
3. <u>Agrostis stolonifera</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>		
4. <u>Equisetum telemateia</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>		
5. <u>Phalaris arundinacea</u>	<u>3</u>	<u>No</u>	<u>FACW</u>		
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
	<u>23</u>	= Total Cover			
Woody Vine Stratum (Plot size: r=2m)					
1. <u>none</u>				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
2. _____					
	<u>0</u>	= Total Cover			
% Bare Ground in Herb Stratum <u>0</u>					
Remarks:					
				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

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

Project/Site: Willows Rd City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 7(WET)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5
 Subregion (LRR): A Lat: 47.686304 Long: -122.146289 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The SP is located on the right bank of Willow Creek, between Willows Road and the trail. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>60</u>	Yes	<u>FAC</u>	
2. _____				
3. _____				
4. _____				
	<u>60</u>	= Total Cover		
Sapling/Shrub Stratum	(Plot size: <u>r=2m</u>)			
1. <u>none</u>				
2. _____				
3. _____				
4. _____				
5. _____				
	<u>0</u>	= Total Cover		
Herb Stratum	(Plot size: <u>r=1m</u>)			
1. <u>Phalaris arundinacea</u>	<u>75</u>	Yes	<u>FACW</u>	
2. <u>Scirpus microcarpus</u>	<u>5</u>	No	<u>OBL</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>80</u>	= Total Cover		
Woody Vine Stratum	(Plot size: <u>r=2m</u>)			
1. <u>none</u>				
2. _____				
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>20</u>				

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

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

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

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

Project/Site: Willows Road City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 8(UPL)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 20
 Subregion (LRR): A Lat: 47.86331 Long: -122.146173 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The SP is just east of wetland on rip rap fill slope. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Notes
Tree Stratum (Plot size: r=3m)				
1. <u>Alnus rubra</u>	<u>50</u>	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</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>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
<u>50</u> = Total Cover				
Sapling/Shrub Stratum (Plot size: r=2m)				
1. <u>Rubus armeniacus</u>	<u>5</u>	Yes	FAC	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
<u>5</u> = Total Cover				
Herb Stratum (Plot size: r=1m)				
1. <u>Phalaris arundinacea</u>	<u>25</u>	Yes	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>25</u> = Total Cover				
Woody Vine Stratum (Plot size: r=2m)				
1. <u>none</u>	_____	_____	_____	
2. _____	_____	_____	_____	
<u>0</u> = Total Cover				
% Bare Ground in Herb Stratum <u>0</u>				

Remarks:

SOIL

Sampling Point: 8(UPL)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0+							rip rap	
			</					

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

Project/Site: Willows Rd City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 9(WET)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): none Slope (%): 2
 Subregion (LRR): A Lat: 47.685959 Long: -122.146528 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The SP is in a swale downslope from the road prism embankment. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

Stratum	Absolute % Cover	Dominant Species?	Indicator Status	Notes
Tree Stratum (Plot size: r=3m)				
1. <u>Alnus rubra</u>	<u>70</u>	Yes	FAC	
2. _____				
3. _____				
4. _____				
	<u>70</u>	= Total Cover		
Sapling/Shrub Stratum (Plot size: r=2m)				
1. <u>Rubus armeniacus</u>	<u>60</u>	Yes	FAC	
2. _____				
3. _____				
4. _____				
5. _____				
	<u>60</u>	= Total Cover		
Herb Stratum (Plot size: r=1m)				
1. <u>Phalaris arundinacea</u>	<u>20</u>	Yes	FACW	
2. <u>Poa pratensis</u>	<u>30</u>	Yes	FAC	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
	<u>50</u>	= Total Cover		
Woody Vine Stratum (Plot size: r=2m)				
1. <u>none</u>				
2. _____				
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>0</u>				

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

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

Hydrophytic Vegetation Indicators:
 Rapid Test for Hydrophytic Vegetation
 Dominance Test is >50%
 Prevalence Index is ≤3.0¹
 Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Wetland Non-Vascular Plants¹
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No

Remarks:

SOIL

Sampling Point: 9(WET)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-6	2.5Y 5/1	75					L	
	2.5Y 4/1	20	5YR 5/6	5	C	M	S	
6-12	2.5Y 5/1	70	10YR 5/6	10	C	M	SL	
	2.5Y 4/1	20					SL	
12-16+	2.5Y 5/1	60	10YR 5/8	15	C	M	SL	
	2.5Y 4/1	25					SL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	Indicators for Problematic Hydric Soils³: <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red Parent Material (TF2) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) ³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Remarks:

HYDROLOGY

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

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

Remarks:

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

Project/Site: Willows Rd City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 10(UPL)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 15
 Subregion (LRR): A Lat: 47.686036 Long: -122.146394 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The SP is located directly upslope from SP-9(WET) on full slope. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>30</u>	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</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>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>30</u>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>r=2m</u>)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
1. <u>Rubus armeniacus</u>	<u>20</u>	Yes	FAC	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>20</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>r=1m</u>)				Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1. <u>Phalaris arundinacea</u>	<u>10</u>	Yes	FACW	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>10</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>r=2m</u>)				Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
1. <u>none</u>	_____	_____	_____	
2. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
% Bare Ground in Herb Stratum <u>80</u>				
Remarks:				

SOIL

Sampling Point: 10(UPL)

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

Depth (inches)	Matrix		Redox Features			Loc ²	Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹			
0-8	10YR 3/3	100					SL	
8-16+	10YR 3/3	100	10YR 3/6	5			SL	

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

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

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	Indicators for Problematic Hydric Soils³:
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Redox Depressions (F8)	

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

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

Restrictive Layer (if present):
 Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Water-Stained Leaves (B9) (MLRA 1, 2, 4A, and 4B)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Raised Ant Mounds (D6) (LRR A)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Frost-Heave Hummocks (D7)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	
<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	

Field Observations:

Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____	Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): >16" _____	
Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (includes capillary fringe)	Depth (inches): >16" _____	

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

Remarks:

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

Project/Site: Willows Rd City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 11(WET)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 15
 Subregion (LRR): A Lat: 47.687097 Long: -122.147598 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: The SP is located at the toe of fill slope, just inside wetland boundaries. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>30</u>	Yes	FAC	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)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>30</u>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>Cornus alba</u>	<u>2</u>	No	FACW	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	<u>2</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>r=1m</u>)				
1. <u>Phalaris arundinacea</u>	<u>30</u>	Yes	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Poa pratensis</u>	<u>20</u>	Yes	FAC	
3. <u>Lotus corniculatus</u>	<u>20</u>	Yes	FAC	
4. <u>Ranunculus repens</u>	<u>10</u>	No	FAC	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
	<u>80</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
	<u>0</u>	= Total Cover		
<u>% Bare Ground in Herb Stratum</u> <u>20</u>				

Remarks:

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

Project/Site: Willows Rd City/County: Redmond/King Sampling Date: 12/5/17
 Applicant/Owner: City of Redmond State: WA Sampling Point: 12(UPL)
 Investigator(s): Adam Merrill, Trey Parry Section, Township, Range: S3 T25N R5E
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 10
 Subregion (LRR): A Lat: 47.687166 Long: -122.147552 Datum: WGS-84
 Soil Map Unit Name: Indianola loamy sand NWI classification: none

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

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is the Sampled Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: The SP is located on a road fill slope, just uphill (east) from Wetland F. WETS table indicates conditions are wetter than normal for previous 3 months.	

VEGETATION – Use scientific names of plants.

<u>Tree Stratum</u> (Plot size: <u>r=3m</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <u>Alnus rubra</u>	<u>30</u>	Yes	FAC	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across All Strata: <u>5</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60</u> (A/B)
2. <u>Pinus sp. (ornamental)</u>	<u>20</u>	Yes	NL	
3. <u>Acer sp. (ornamental)</u>	<u>10</u>	No	NL	
4. _____	<u>60</u>	= Total Cover		
<u>Sapling/Shrub Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>Rhododendron sp. (ornamental)</u>	<u>10</u>	Yes	NL	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
2. <u>Rubus armeniacus</u>	<u>2</u>	No	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	<u>12</u>	= Total Cover		
<u>Herb Stratum</u> (Plot size: <u>r=1m</u>)				
1. <u>Phalaris arundinacea</u>	<u>30</u>	Yes	FACW	Hydrophytic Vegetation Indicators: <input type="checkbox"/> Rapid Test for Hydrophytic Vegetation <input checked="" type="checkbox"/> Dominance Test is >50% <input type="checkbox"/> Prevalence Index is ≤3.0 ¹ <input type="checkbox"/> Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Wetland Non-Vascular Plants ¹ <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Poa sp.</u>	<u>30</u>	Yes	FAC	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	<u>60</u>	= Total Cover		
<u>Woody Vine Stratum</u> (Plot size: <u>r=2m</u>)				
1. <u>none</u>	_____	_____	_____	Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
2. _____	_____	_____	_____	
% Bare Ground in Herb Stratum <u>40</u>				

Remarks:

Appendix D

Wetland Rating Forms



Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 12-5-17
 Rated by Adam Merrill Trained by Ecology? X Yes ___ No Date of training 2014
 HGM Class used for rating Riverine Wetland has multiple HGM classes? ___ Y X N

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

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

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality		Hydrologic		Habitat				
<i>Circle the appropriate ratings</i>									
Site Potential	H	M	<u>L</u>	H	<u>M</u>	L	H	M	<u>L</u>
Landscape Potential	<u>H</u>	M	L	<u>H</u>	M	L	H	M	<u>L</u>
Value	H	<u>M</u>	L	H	<u>M</u>	L	H	<u>M</u>	L
Score Based on Ratings	6		7		4		TOTAL	17	

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

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

Riverine Wetlands

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

Lake Fringe Wetlands

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

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Plant cover of 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 A

NO – go to 6

YES – The wetland class is Riverine

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

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

NO – go to 7

YES – The wetland class is Depressional

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

NO – go to 8

YES – The wetland class is Depressional

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

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

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

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

Wetland name or number A

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	0
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	0
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	0

Rating of Site Potential If score is: 12-16 = H 6-11 = M X 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	1
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 Other sources <u> vehicle exhaust particulates </u>	Yes = 1 No = 0	1
Total for R 2	Add the points in the boxes above	5

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? (<i>answer YES if there is a TMDL for the drainage in which the unit is found</i>)	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 A

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: <i>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).</i> If the ratio is more than 20 If the ratio is 10-20 If the ratio is 5-<10 If the ratio is 1-<5 If the ratio is < 1	points = 9 points = 6 points = 4 points = 2 points = 1	2
R 4.2. Characteristics of plants that slow down water velocities during floods: <i>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).</i> Forest or shrub for > ¹ / ₃ area OR emergent plants > ² / ₃ area Forest or shrub for > ¹ / ₁₀ area OR emergent plants > ¹ / ₃ area Plants do not meet above criteria	points = 7 points = 4 points = 0	7
Total for R 4	Add the points in the boxes above	9

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

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	1
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	1
Total for R 5	Add the points in the boxes above	3

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

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? <i>Choose the description that best fits the site.</i> 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) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	points = 2 points = 1 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

Wetland name or number A

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

- Aquatic bed 4 structures or more: points = 4
 - Emergent 3 structures: points = 2
 - Scrub-shrub (areas where shrubs have > 30% cover) **2 structures: points = 1**
 - 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

1

H 1.2. Hydroperiods

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

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

1

H 1.3. Richness of plant species

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

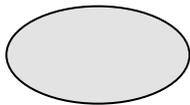
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

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

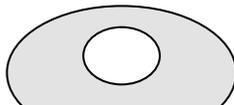
1

H 1.4. Interspersion of habitats

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



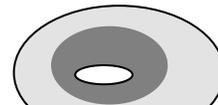
None = 0 points



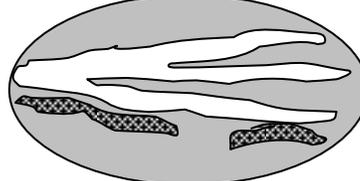
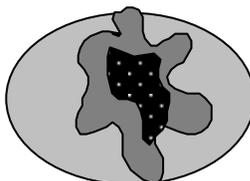
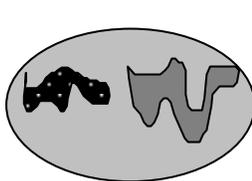
Low = 1 point



Moderate = 2 points



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



1

Wetland name or number A

<p>H 1.5. Special habitat features: Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i> <input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). <input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input 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 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 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>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p>		0
Total for H 1	Add the points in the boxes above	4

Rating of Site Potential If score is: 15-18 = H 7-14 = M X 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>). <i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u>% 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</p>		0
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u>% 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</p>		1
<p>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</p>		-2
Total for H 2	Add the points in the boxes above	-1

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

H 3.0. Is the habitat provided by the site valuable to society?		
<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> Site meets ANY of the following criteria: points = 2 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan 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</p>		1

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

Wetland name or number A

WDFW Priority Habitats

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

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

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

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

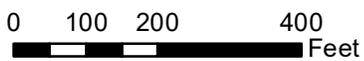
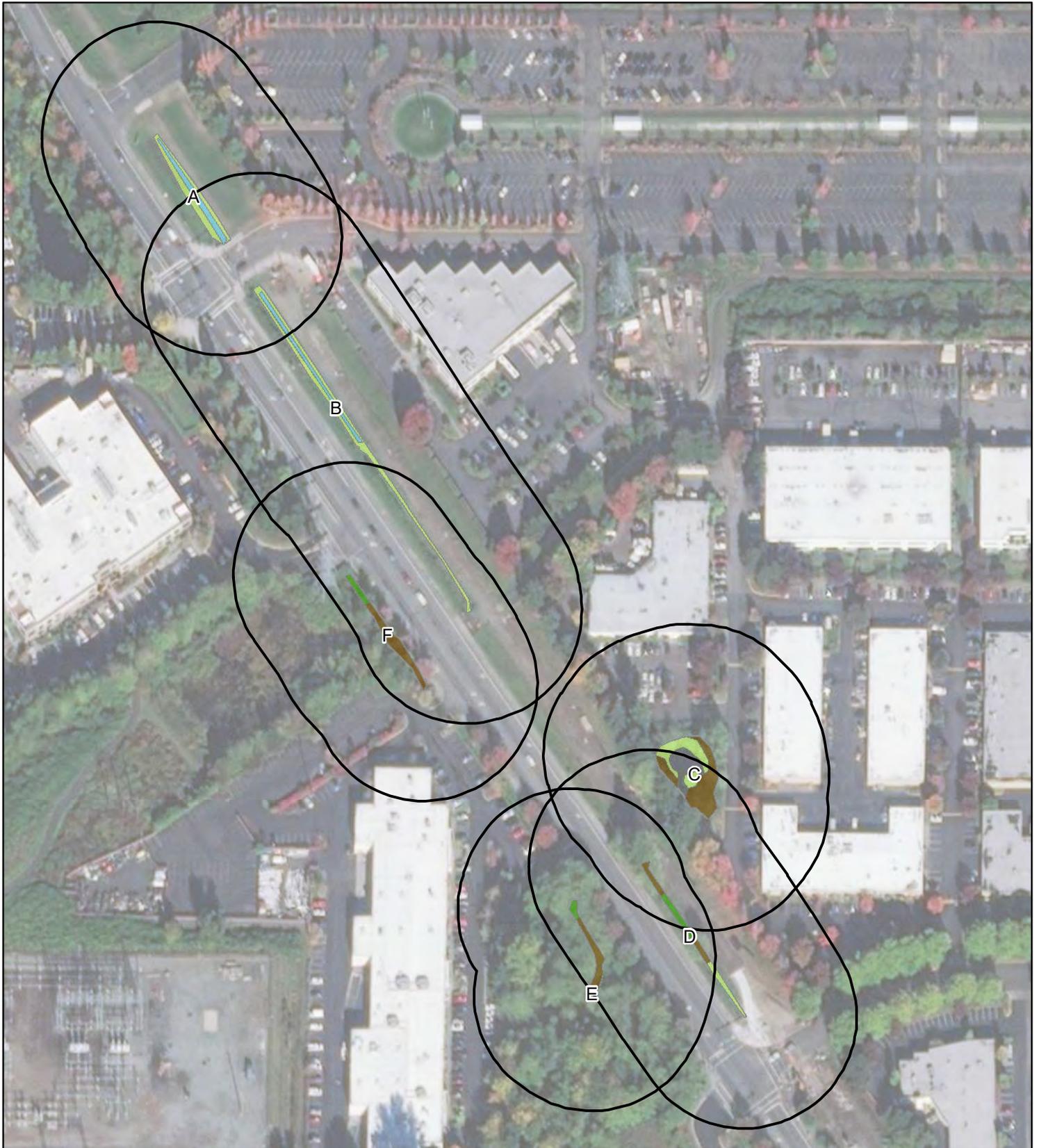
Wetland name or number A

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>	
<p>SC 1.0. Estuarine wetlands</p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <p style="text-align: right;">Yes – Go to SC 1.1 No = Not an estuarine wetland</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p style="text-align: right;">Yes = Category I No - Go to SC 1.2</p>	Cat. I
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two 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 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 2.0. Wetlands of High Conservation Value (WHCV)</p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;">Yes – Go to SC 2.2 No – Go to SC 2.3</p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p> <p>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</p> <p style="text-align: right;">Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV</p> <p>SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p>	Cat. I
<p>SC 3.0. Bogs</p> <p>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></p> <p>SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No – Go to SC 3.2</p> <p>SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No = Is not a bog</p> <p>SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?</p> <p style="text-align: right;">Yes = Is a Category I bog No – Go to SC 3.4</p> <p>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.</p> <p>SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?</p> <p style="text-align: right;">Yes = Is a Category I bog No = Is not a bog</p>	Cat. I

Wetland name or number A

<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>	<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 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>	<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 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>	<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>	<p>N/A</p>



Cowardin Class  150ft polygon

-  Aquatic Bed
-  Emergent
-  Scrub-Shrub
-  Forested

Wetlands A through F Cowardin Classes

Willows Road Project
City of Redmond



0 50 100 200
Feet

- - - - Stream
- Hydroperiod Type**
- Permanently Flooded
- Seasonally Flooded
- Occasionally Flooded
- Saturated Only

Wetlands A, B, & F Hydroperiods

Willows Road Project
City of Redmond



Redmond



0 550 1,100 2,200
Feet

-  Wetland
-  1 km Buffer

Wetland A 1 Kilometer Buffer

Willows Road Project
City of Redmond

Add or remove map data

Assessed Waters/Sediment

Water

Category 5 - 303d

Category 4C

Category 4B

Category 4A

Category 2

Category 1

Sediment

Category 5 - 303d

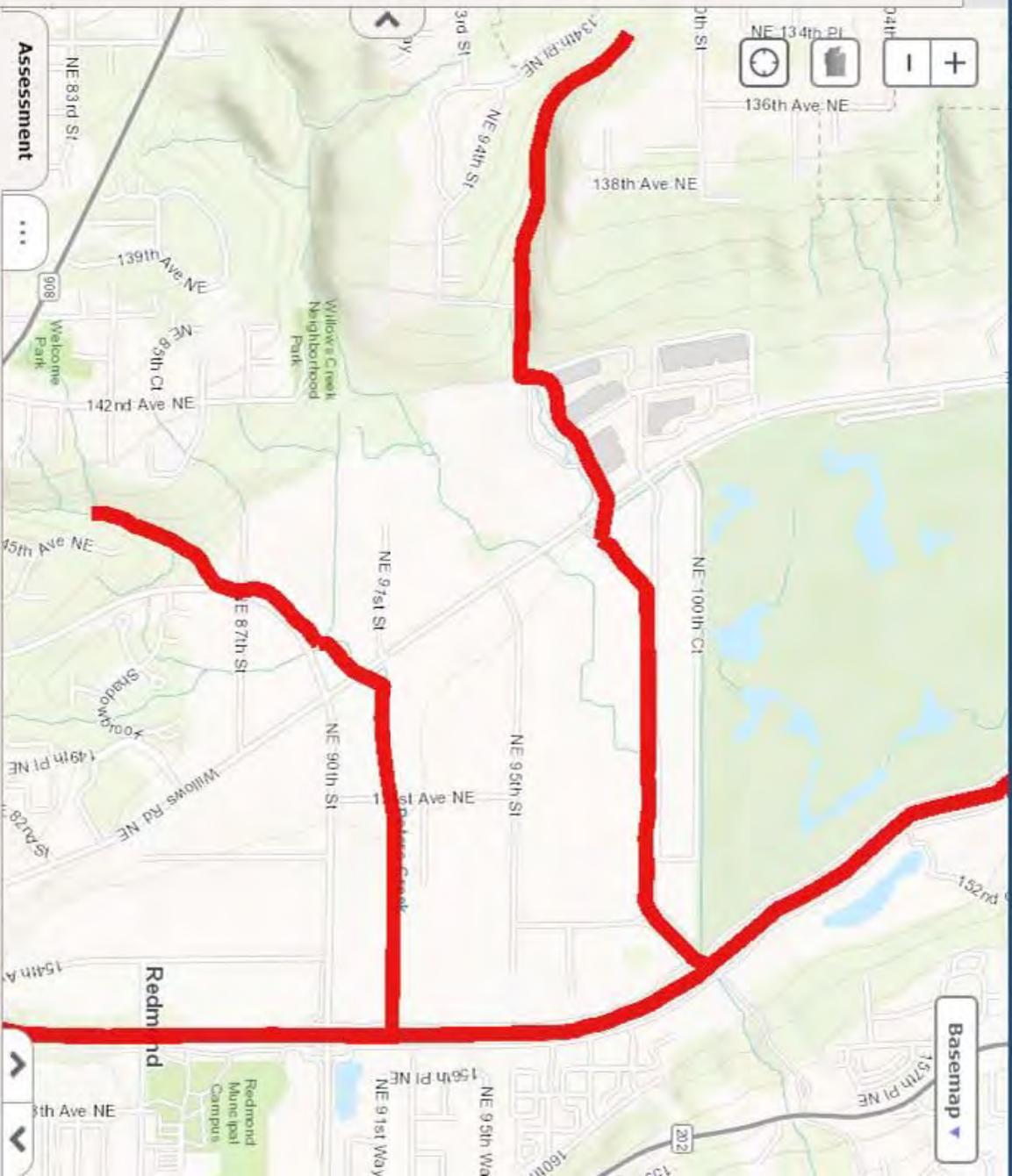
Category 4C

Category 4B

Category 4A

Category 2

Category 1



Zoom to selection

Export to csv

Assessment

...

Find

Listing ID

Assessment Unit ID

Category

Medium

Parameter

Details

Water Quality Improvement Projects (TMDLs)

[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > [WRIA 8: Cedar-Sammamish](#)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- [King](#)
- [Snohomish](#)



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrcek 425-649-7165
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Project is under development	Ralph Svrcek 425-649-7165
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165

** Status will be listed as one of the following: *Approved by EPA, Under Development or Implementation*

For more information about WRIA 8:

- [Waterbodies in WRIA 8](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 8](#)

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

[Back to top of page](#)

Wetland name or number B

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland B Date of site visit: 12-5-17
 Rated by Adam Merrill Trained by Ecology? X Yes ___ No Date of training 2014
 HGM Class used for rating Riverine Wetland has multiple HGM classes? X 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 III (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality		Hydrologic		Habitat					
<i>Circle the appropriate ratings</i>										
Site Potential	H	M	<u>L</u>	H	<u>M</u>	L	H	M	<u>L</u>	
Landscape Potential	<u>H</u>	M	L	<u>H</u>	M	L	H	M	<u>L</u>	
Value	H	<u>M</u>	L	H	<u>M</u>	L	H	<u>M</u>	L	TOTAL
Score Based on Ratings	6		7		4		17			

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number _B_

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 B

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 B

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	2
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	0
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	2

Rating of Site Potential If score is: 12-16 = H 6-11 = M X 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	1
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 Other sources <u> vehicle exhaust particulates </u>	Yes = 1 No = 0	1
Total for R 2	Add the points in the boxes above	5

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? (<i>answer YES if there is a TMDL for the drainage in which the unit is found</i>)	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 B

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: <i>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).</i> If the ratio is more than 20 If the ratio is 10-20 If the ratio is 5-<10 If the ratio is 1-<5 If the ratio is < 1	points = 9 points = 6 points = 4 points = 2 points = 1	1
R 4.2. Characteristics of plants that slow down water velocities during floods: <i>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).</i> Forest or shrub for > ¹ / ₃ area OR emergent plants > ² / ₃ area Forest or shrub for > ¹ / ₁₀ area OR emergent plants > ¹ / ₃ area Plants do not meet above criteria	points = 7 points = 4 points = 0	7
Total for R 4	Add the points in the boxes above	8

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

Record the rating on the first page

R 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
R 5.1. Is the stream or river adjacent to the wetland downcut?	Yes = 0 No = 1	1
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	1
Total for R 5	Add the points in the boxes above	3

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

Record the rating on the first page

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? <i>Choose the description that best fits the site.</i> 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) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream	points = 2 points = 1 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

Wetland name or number B

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

- Aquatic bed 4 structures or more: points = 4
 - Emergent 3 structures: points = 2
 - Scrub-shrub (areas where shrubs have > 30% cover) **2 structures: points = 1**
 - 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

1

H 1.2. Hydroperiods

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

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

2

H 1.3. Richness of plant species

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

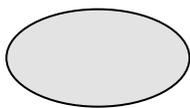
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

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

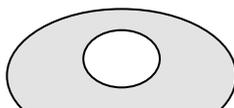
1

H 1.4. Interspersion of habitats

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



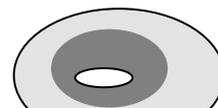
None = 0 points



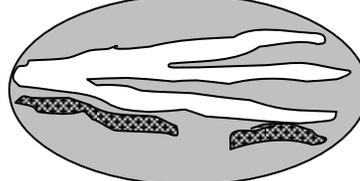
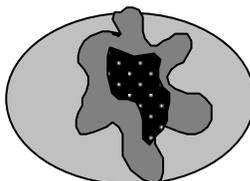
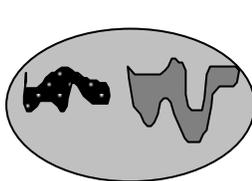
Low = 1 point



Moderate = 2 points



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



1

Wetland name or number B

<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> <input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). <input type="checkbox"/> Standing snags (dbh > 4 in) within the wetland <input 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 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 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>) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in every stratum of plants (<i>see H 1.1 for list of strata</i>)</p>	0
<p>Total for H 1</p>	<p>Add the points in the boxes above</p> <p>5</p>

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

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>	
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>). <i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u> % 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</p>	0
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. <i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u> % 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</p>	1
<p>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</p>	-2
<p>Total for H 2</p>	<p>Add the points in the boxes above</p> <p>-1</p>

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

<p>H 3.0. Is the habitat provided by the site valuable to society?</p>	
<p>H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? <i>Choose only the highest score that applies to the wetland being rated.</i> Site meets ANY of the following criteria: points = 2 <input type="checkbox"/> It has 3 or more priority habitats within 100 m (see next page) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input type="checkbox"/> It is mapped as a location for an individual WDFW priority species <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan 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</p>	1

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

Wetland name or number B

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.

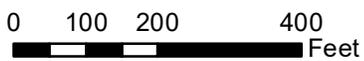
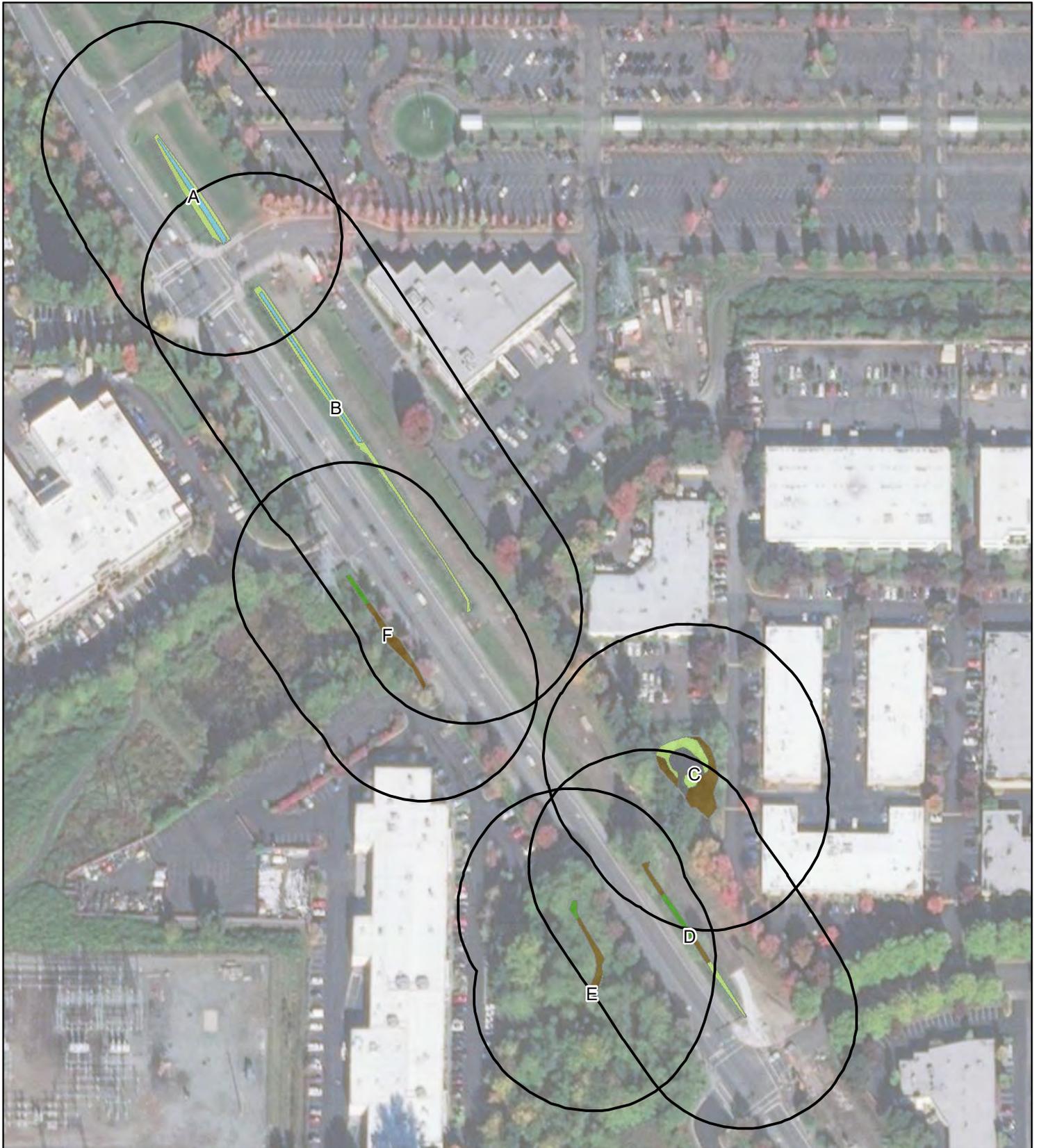
Wetland name or number B

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>	
<p>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</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2</p>	Cat. I
<p>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. Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>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? 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</p>	Cat. I
<p>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. 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</p>	Cat. I

Wetland name or number B

<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>	<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 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>	<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 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>	<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>	<p>N/A</p>

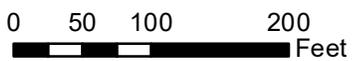


Cowardin Class  150ft polygon

-  Aquatic Bed
-  Emergent
-  Scrub-Shrub
-  Forested

Wetlands A through F Cowardin Classes

Willows Road Project
City of Redmond



- - - - Stream
- Hydroperiod Type**
- Permanently Flooded
- Seasonally Flooded
- Occasionally Flooded
- Saturated Only

Wetlands A, B, & F Hydroperiods

Willows Road Project
City of Redmond



0 550 1,100 2,200
Feet

-  Wetland
-  1 km Buffer

Wetland B 1 Kilometer Buffer

Willows Road Project
City of Redmond

 Add or remove map data

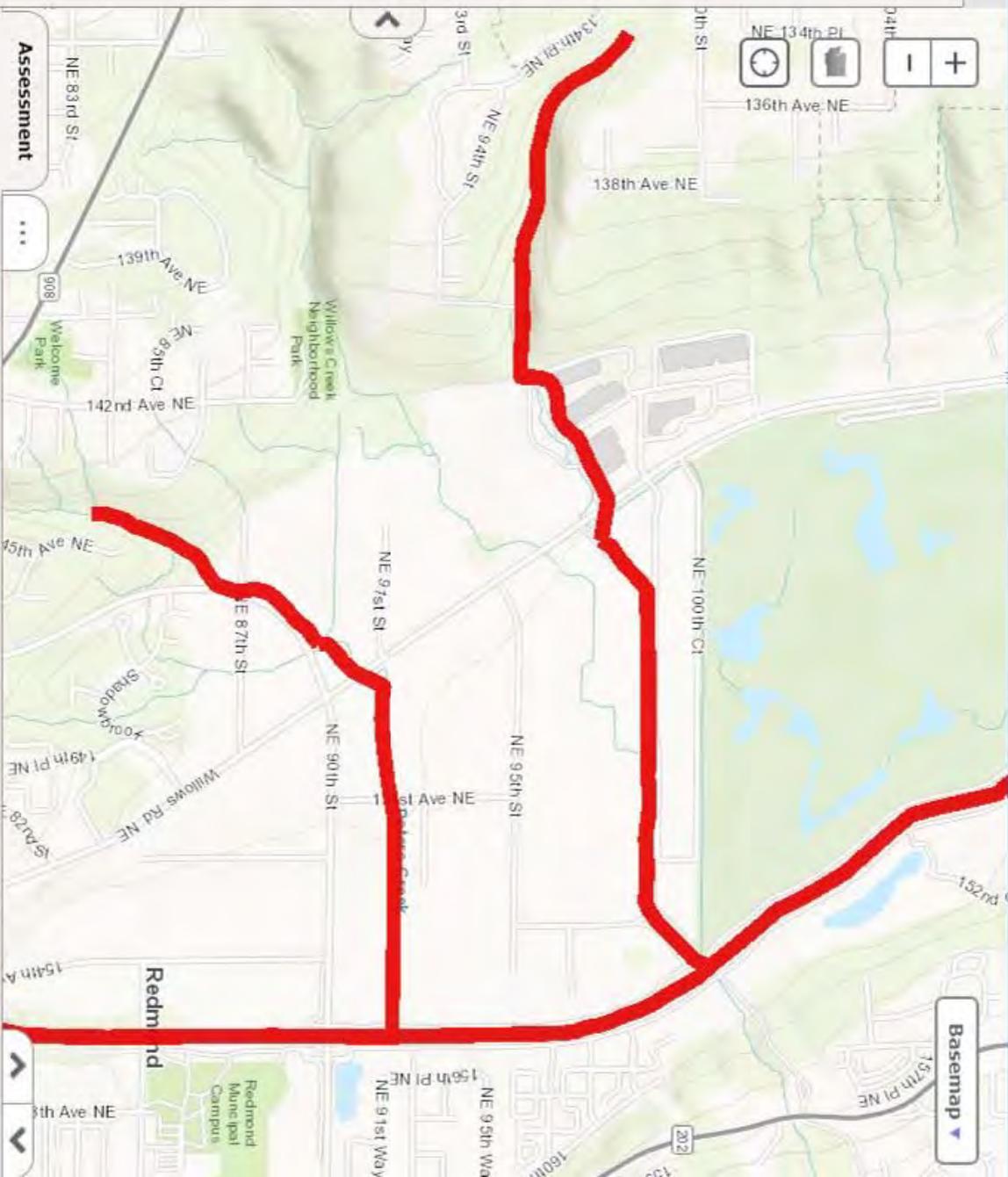
Assessed Waters/Sediment 

Water

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

Sediment

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



Assessment

Zoom to selection

Export to csv

Find

Listing ID

Assessment Unit ID

Category

Medium

Parameter

Details

Water Quality Improvement Projects (TMDLs)

[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > [WRIA 8: Cedar-Sammamish](#)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- [King](#)
- [Snohomish](#)



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrcek 425-649-7165
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Project is under development	Ralph Svrcek 425-649-7165
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165

** Status will be listed as one of the following: *Approved by EPA, Under Development or Implementation*

For more information about WRIA 8:

- [Waterbodies in WRIA 8](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 8](#)

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Wetland name or number C

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland C Date of site visit: 12-5-17
 Rated by Adam Merrill Trained by Ecology? X Yes ___ No Date of training 2014
 HGM Class used for rating depressional Wetland has multiple HGM classes? X 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 III (based on functions X or special characteristics ___)

1. Category of wetland based on FUNCTIONS

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

FUNCTION	Improving Water Quality			Hydrologic			Habitat			
<i>Circle the appropriate ratings</i>										
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	TOTAL
Score Based on Ratings	7			6			6			19

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

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

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number C

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 C

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 C

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

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

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland unit receive stormwater discharges?	Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1-D 2.3? Source <u>vehicle exhaust particulates</u>	Yes = 1 No = 0	1
Total for D 2		3

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

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

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	0
Wetland has an intermittently flowing stream or ditch, OR highly constricted permanently flowing outlet	points = 2	
Wetland is a flat depression (QUESTION 7 on key), whose outlet is a permanently flowing ditch	points = 1	
Wetland has an unconstricted, or slightly constricted, surface outlet that is permanently flowing	points = 0	
D 4.2. Depth of storage during wet periods: Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or if dry, the deepest part.		
Marks of ponding are 3 ft or more above the surface or bottom of outlet	points = 7	3
Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet	points = 5	
Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet	points = 3	
The wetland is a "headwater" wetland	points = 3	
Wetland is flat but has small depressions on the surface that trap water	points = 1	
Marks of ponding less than 0.5 ft (6 in)	points = 0	
D 4.3. Contribution of the wetland to storage in the watershed: Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.		
The area of the basin is less than 10 times the area of the unit	points = 5	0
The area of the basin is 10 to 100 times the area of the unit	points = 3	
The area of the basin is more than 100 times the area of the unit	points = 0	
Entire wetland is in the Flats class	points = 5	
Total for D 4	Add the points in the boxes above	3

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

D 5.0. Does the landscape have the potential to support hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	1
D 5.2. Is >10% of the area within 150 ft of the wetland in land uses that generate excess runoff?	Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses (residential at >1 residence/ac, urban, commercial, agriculture, etc.)?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	3

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

D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The unit is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland unit being rated. Do not add points. Choose the highest score if more than one condition is met.		
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):		1
• Flooding occurs in a sub-basin that is immediately down-gradient of unit.	points = 2	
• Surface flooding problems are in a sub-basin farther down-gradient.	points = 1	
Flooding from groundwater is an issue in the sub-basin.	points = 1	
The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. Explain why _____	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

Wetland name or number C

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

- Aquatic bed 4 structures or more: points = 4
 - Emergent **3 structures: points = 2**
 - Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1
 - 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*).

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

2

H 1.3. Richness of plant species

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

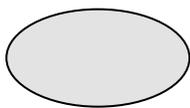
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

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

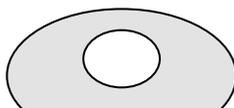
1

H 1.4. Interspersion of habitats

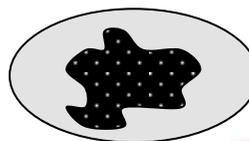
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



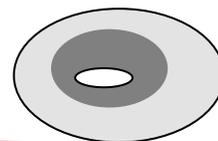
None = 0 points



Low = 1 point

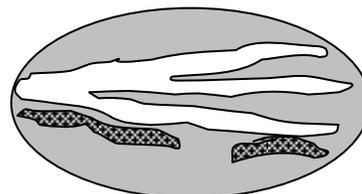
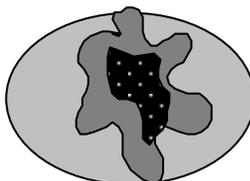
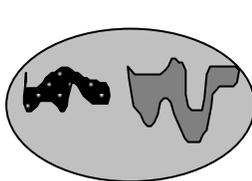


Moderate = 2 points



2

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



Wetland name or number C

<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> <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 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 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>) <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>	3
<p>Total for H 1 Add the points in the boxes above</p>	10

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?	
<p>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</p>	0
<p>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</p>	1
<p>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</p>	-2
<p>Total for H 2 Add the points in the boxes above</p>	-1

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?	
<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> 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) <input type="checkbox"/> It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) <input checked="" type="checkbox"/> It is mapped as a location for an individual WDFW priority species 2 <input type="checkbox"/> It is a Wetland of High Conservation Value as determined by the Department of Natural Resources <input type="checkbox"/> It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan 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</p>	2

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

Wetland name or number C

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 C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

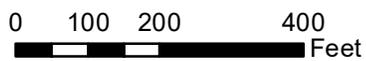
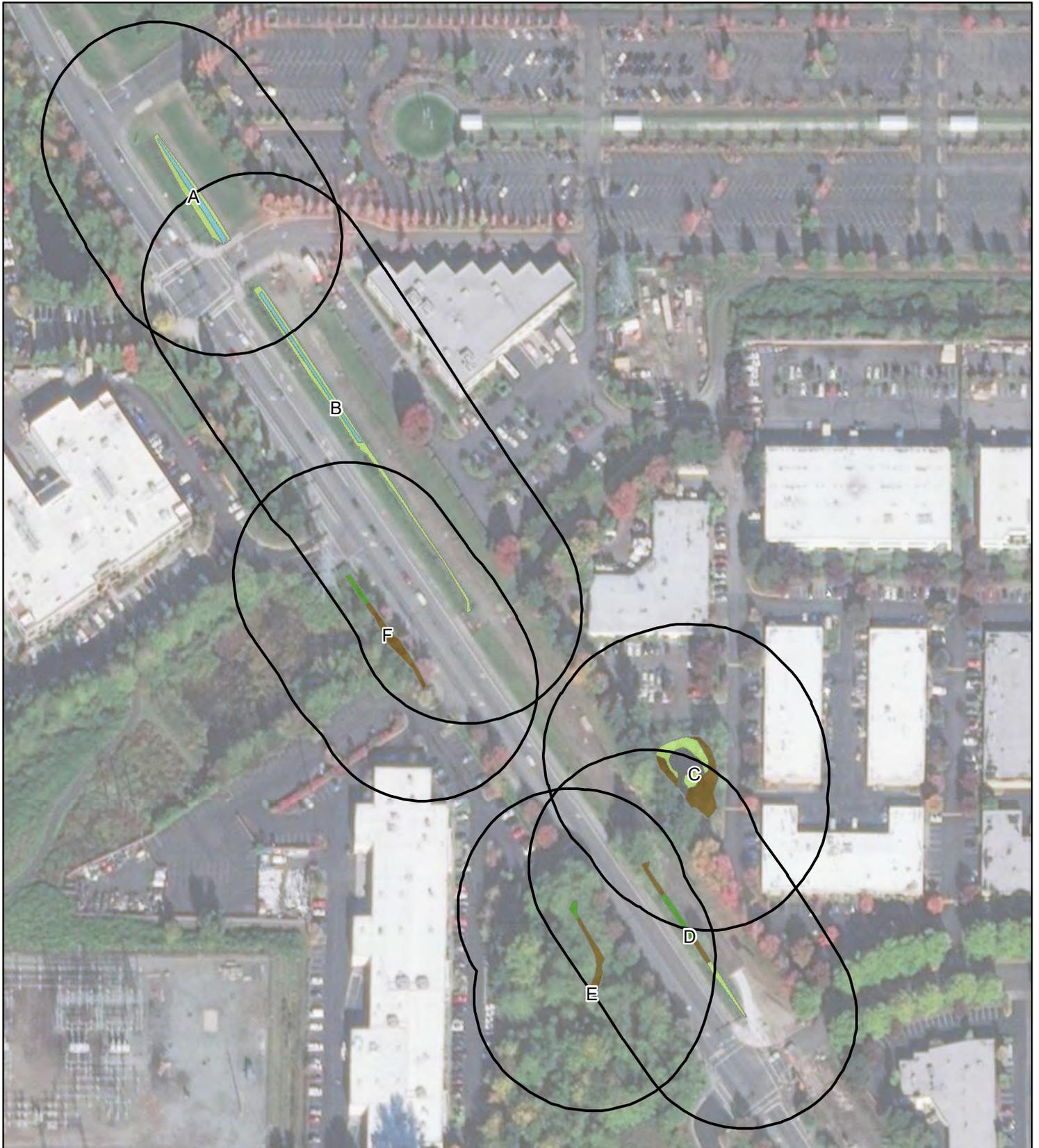
Wetland Type	Category
<i>Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.</i>	
<p>SC 1.0. Estuarine wetlands</p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <p style="text-align: right;">Yes – Go to SC 1.1 No = Not an estuarine wetland</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p style="text-align: right;">Yes = Category I No - Go to SC 1.2</p>	Cat. I
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two 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 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 2.0. Wetlands of High Conservation Value (WHCV)</p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;">Yes – Go to SC 2.2 No – Go to SC 2.3</p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p> <p>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</p> <p style="text-align: right;">Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV</p> <p>SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p>	Cat. I
<p>SC 3.0. Bogs</p> <p>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></p> <p>SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No – Go to SC 3.2</p> <p>SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No = Is not a bog</p> <p>SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?</p> <p style="text-align: right;">Yes = Is a Category I bog No – Go to SC 3.4</p> <p>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.</p> <p>SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?</p> <p style="text-align: right;">Yes = Is a Category I bog No = Is not a bog</p>	Cat. I

Wetland name or number C

<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>	<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 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>	<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 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>	<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>	<p>N/A</p>

Wetland name or number C

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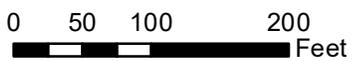
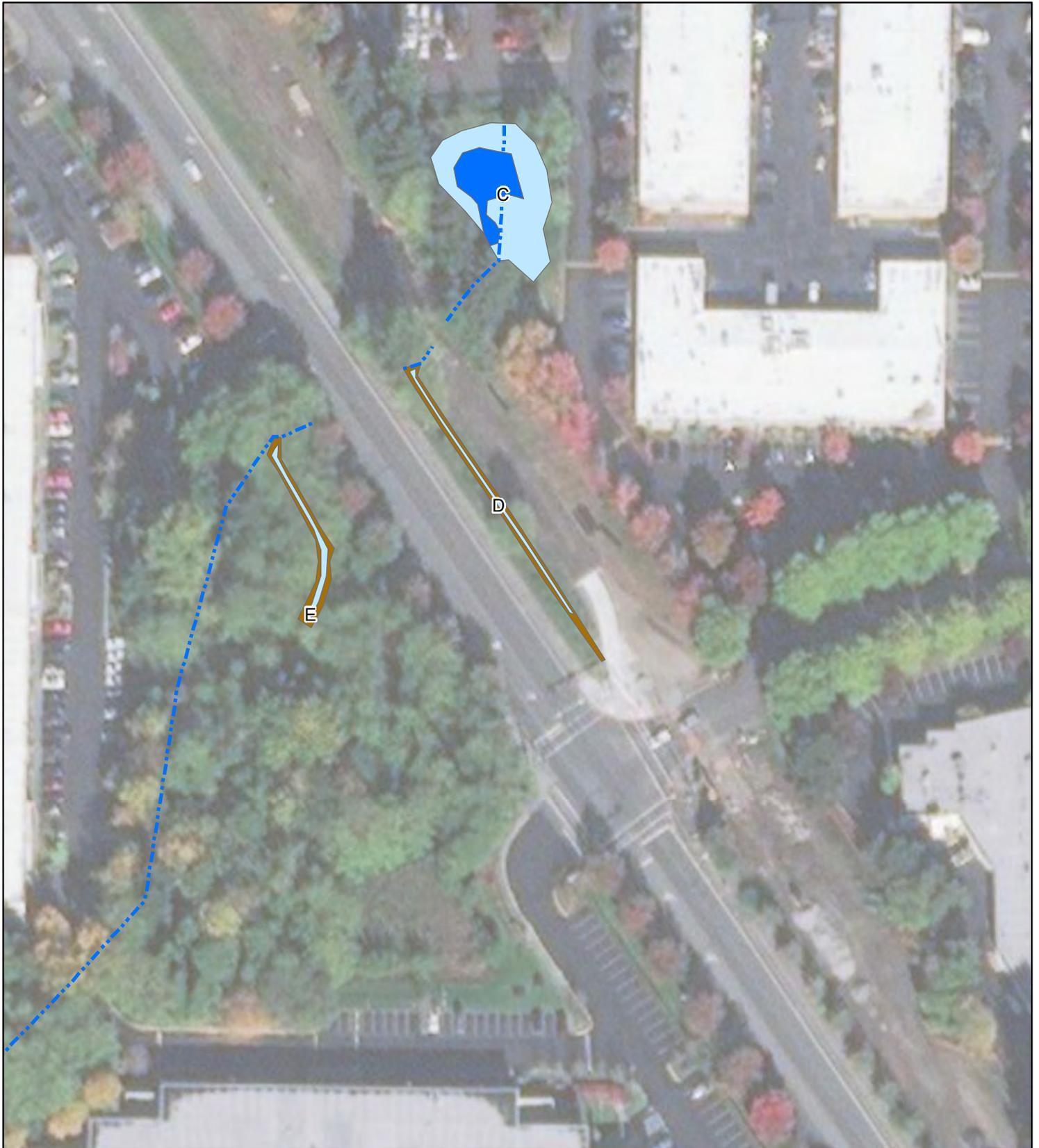


Cowardin Class  150ft polygon

-  Aquatic Bed
-  Emergent
-  Scrub-Shrub
-  Forested

Wetlands A through F Cowardin Classes

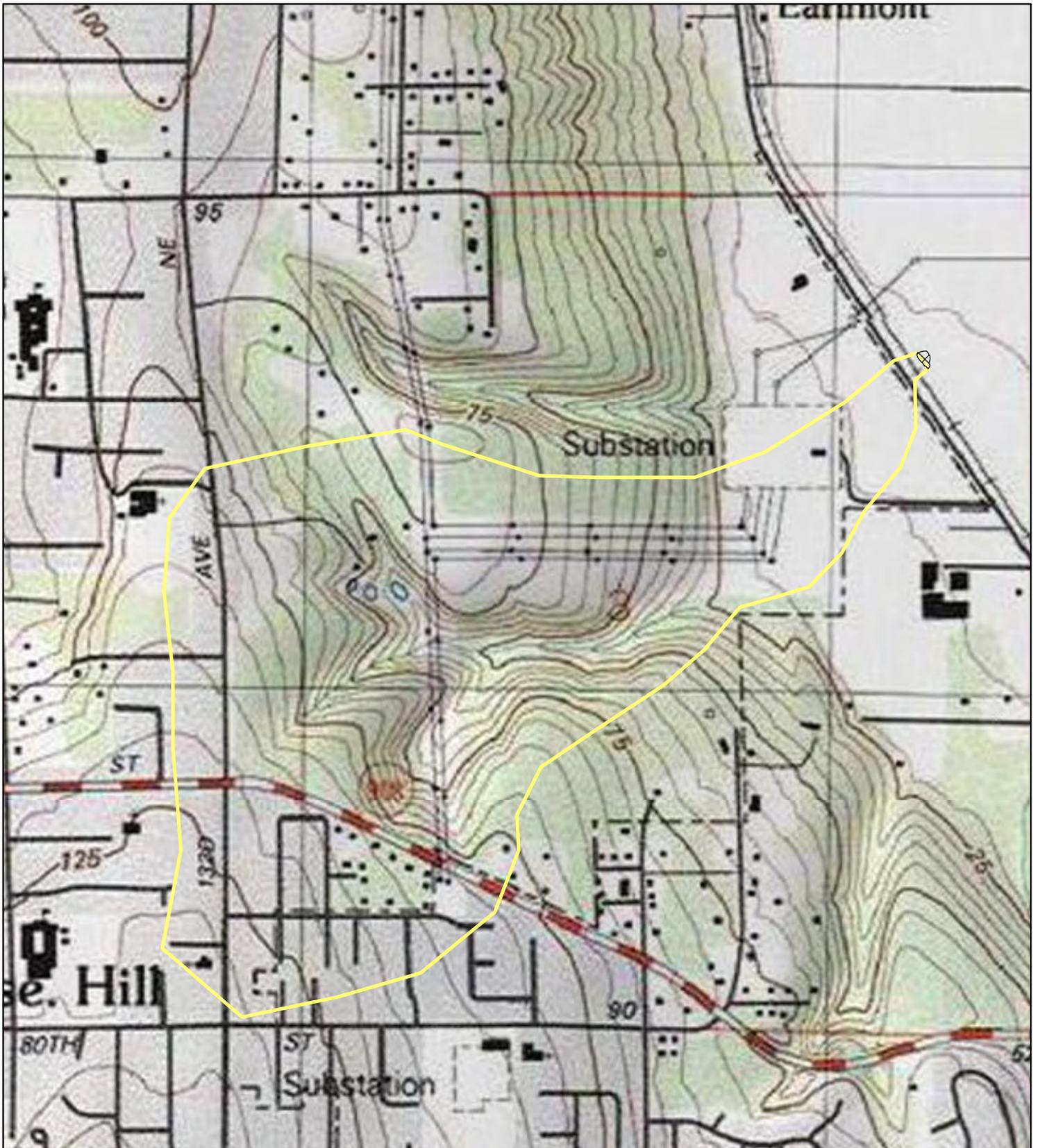
Willows Road Project
City of Redmond



- · - · - Stream
- Hydroperiod Type**
- Permanently Flooded
- Seasonally Flooded
- Occasionally Flooded
- Saturated Only

Wetlands C, D, & E Hydroperiods

Willows Road Project
City of Redmond



0 470 940 1,880
Feet



Wetland



Contributing Basin

Wetland C Contributing Basin

Willows Road Project
City of Redmond



0 550 1,100 2,200
Feet

-  Wetland
-  1 km Buffer

Wetland C 1 Kilometer Buffer

Willows Road Project
City of Redmond

 Add or remove map data

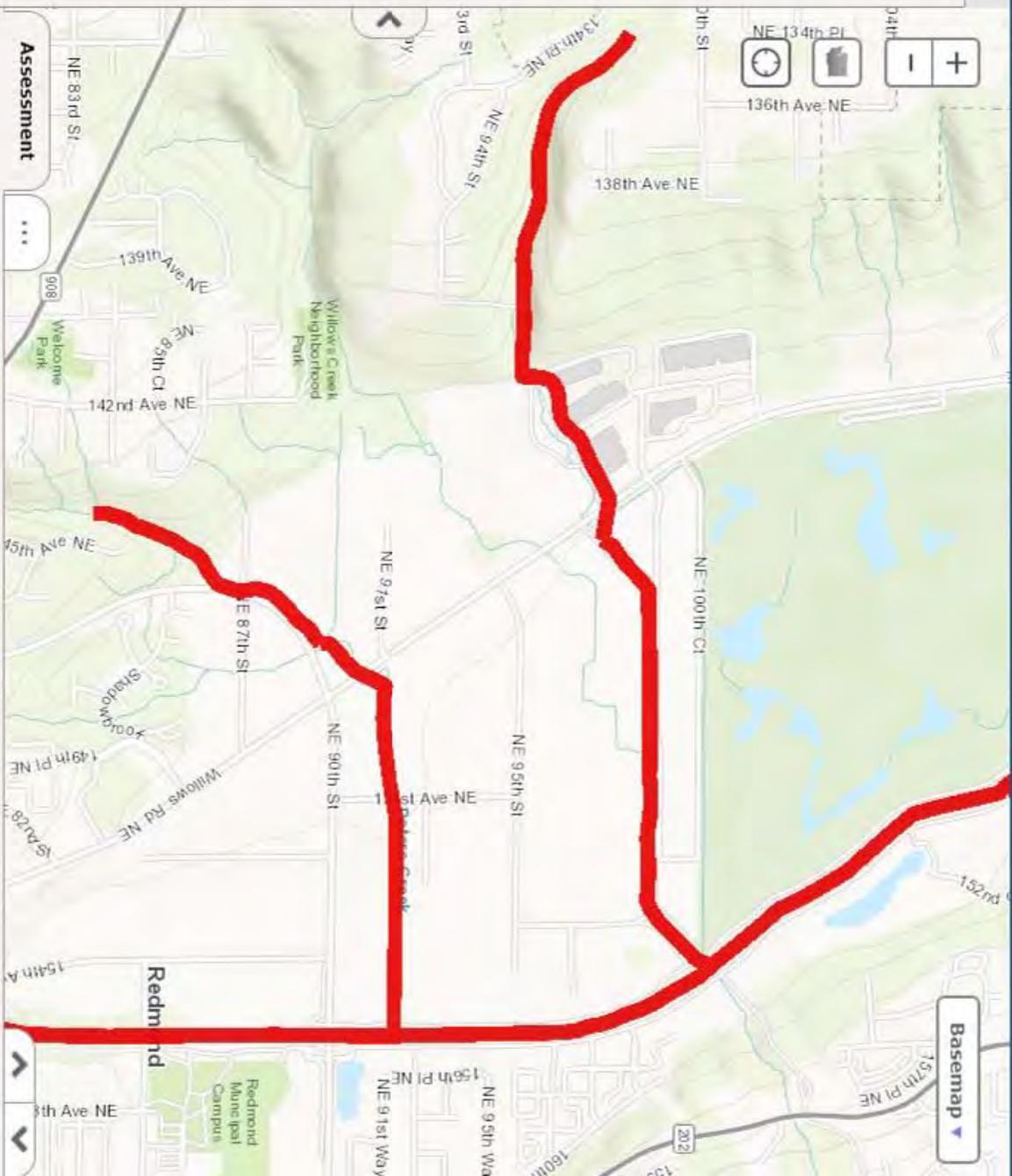
Assessed Waters/Sediment 

Water

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

Sediment

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



Assessment

Zoom to selection

Export to csv

Find Listing ID Assessment Unit ID Category Medium Parameter Details

Water Quality Improvement Projects (TMDLs)

[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > [WRIA 8: Cedar-Sammamish](#)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- [King](#)
- [Snohomish](#)



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrcek 425-649-7165
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Project is under development	Ralph Svrcek 425-649-7165
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165

** Status will be listed as one of the following: *Approved by EPA, Under Development or Implementation*

For more information about WRIA 8:

- [Waterbodies in WRIA 8](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 8](#)

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Wetland name or number D

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland D Date of site visit: 12-5-17

Rated by Adam Merrill Trained by Ecology? X Yes ___ No Date of training 2014

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

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

Source of base aerial photo/map Esri

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

1. Category of wetland based on FUNCTIONS

___ Category I – Total score = 23 - 27

___ Category II – Total score = 20 - 22

X Category III – Total score = 16 - 19

___ Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
<i>Circle the appropriate ratings</i>				
Site Potential	H <u>M</u> L	H <u>M</u> L	H <u>M</u> L	
Landscape Potential	H <u>M</u> L	H <u>M</u> L	H M <u>L</u>	
Value	<u>H</u> M L	H <u>M</u> L	<u>H</u> M L	TOTAL
Score Based on Ratings	7	6	6	19

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
<u>None of the above</u>	

Wetland name or number D

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 D

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 D

SLOPE WETLANDS

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

S 1.0. Does the site have the potential to improve water quality?			
S 1.1. Characteristics of the average slope of the wetland: <i>(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)</i>			
Slope is 1% or less	points = 3		2
Slope is > 1%-2%	points = 2		
Slope is > 2%-5%	points = 1		
Slope is greater than 5%	points = 0		
S 1.2. <u>The soil 2 in below the surface (or duff layer)</u> is true clay or true organic <i>(use NRCS definitions)</i> : Yes = 3 No = 0			0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. <i>Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.</i>			
Dense, uncut, herbaceous plants > 90% of the wetland area	points = 6		6
Dense, uncut, herbaceous plants > ½ of area	points = 3		
Dense, woody, plants > ½ of area	points = 2		
Dense, uncut, herbaceous plants > ¼ of area	points = 1		
Does not meet any of the criteria above for plants	points = 0		
Total for S 1		Add the points in the boxes above	8

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

Record the rating on the first page

S 2.0. Does the landscape have the potential to support the water quality function of the site?			
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?			
	Yes = 1 No = 0		1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources <u>vehicle exhaust particulates</u>			
	Yes = 1 No = 0		1
Total for S 2		Add the points in the boxes above	2

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

Record the rating on the first page

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

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

Record the rating on the first page

Wetland name or number D

SLOPE WETLANDS

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

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

<p>S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. <i>Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.</i> Dense, uncut, rigid plants cover > 90% of the area of the wetland All other conditions</p>	<p>1</p>
---	----------

points = 1
points = 0

Rating of Site Potential If score is: X 1 = M ___ 0 = L

Record the rating on the first page

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

<p>S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff?</p>	<p>1</p>
--	----------

Yes = 1 No = 0

Rating of Landscape Potential If score is: X 1 = M ___ 0 = L

Record the rating on the first page

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

<p>S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) Surface flooding problems are in a sub-basin farther down-gradient No flooding problems anywhere downstream</p>	<p>1</p>
<p>S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan?</p>	<p>0</p>
<p>Total for S 6</p>	<p>1</p>

points = 2
points = 1
points = 0

Yes = 2 No = 0

Add the points in the boxes above

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

Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

Wetland name or number D

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

- Aquatic bed 4 structures or more: points = 4
 - Emergent 3 structures: points = 2
 - Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1
 - 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

4

H 1.2. Hydroperiods

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

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

2

H 1.3. Richness of plant species

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

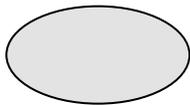
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

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

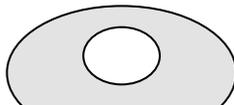
1

H 1.4. Interspersion of habitats

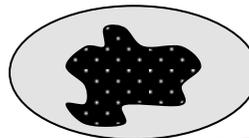
Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always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



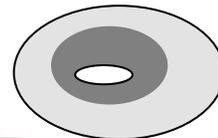
None = 0 points



Low = 1 point

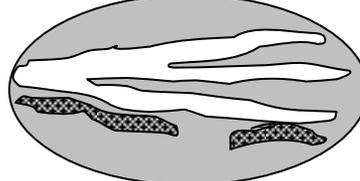
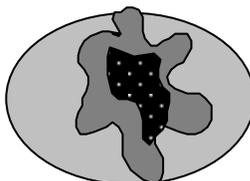
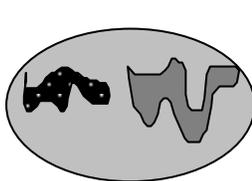


Moderate = 2 points



2

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



Wetland name or number D

<p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long).</p> <p><input checked="" type="checkbox"/> Standing snags (dbh > 4 in) within the wetland</p> <p><input 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 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 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>		1
Total for H 1	Add the points in the boxes above	10

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

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>		
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p><i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u> %</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>		0
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p><i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u> %</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>		1
<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>		-2
Total for H 2	Add the points in the boxes above	-1

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

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

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

Wetland name or number D

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.

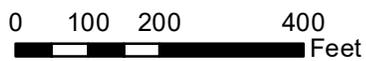
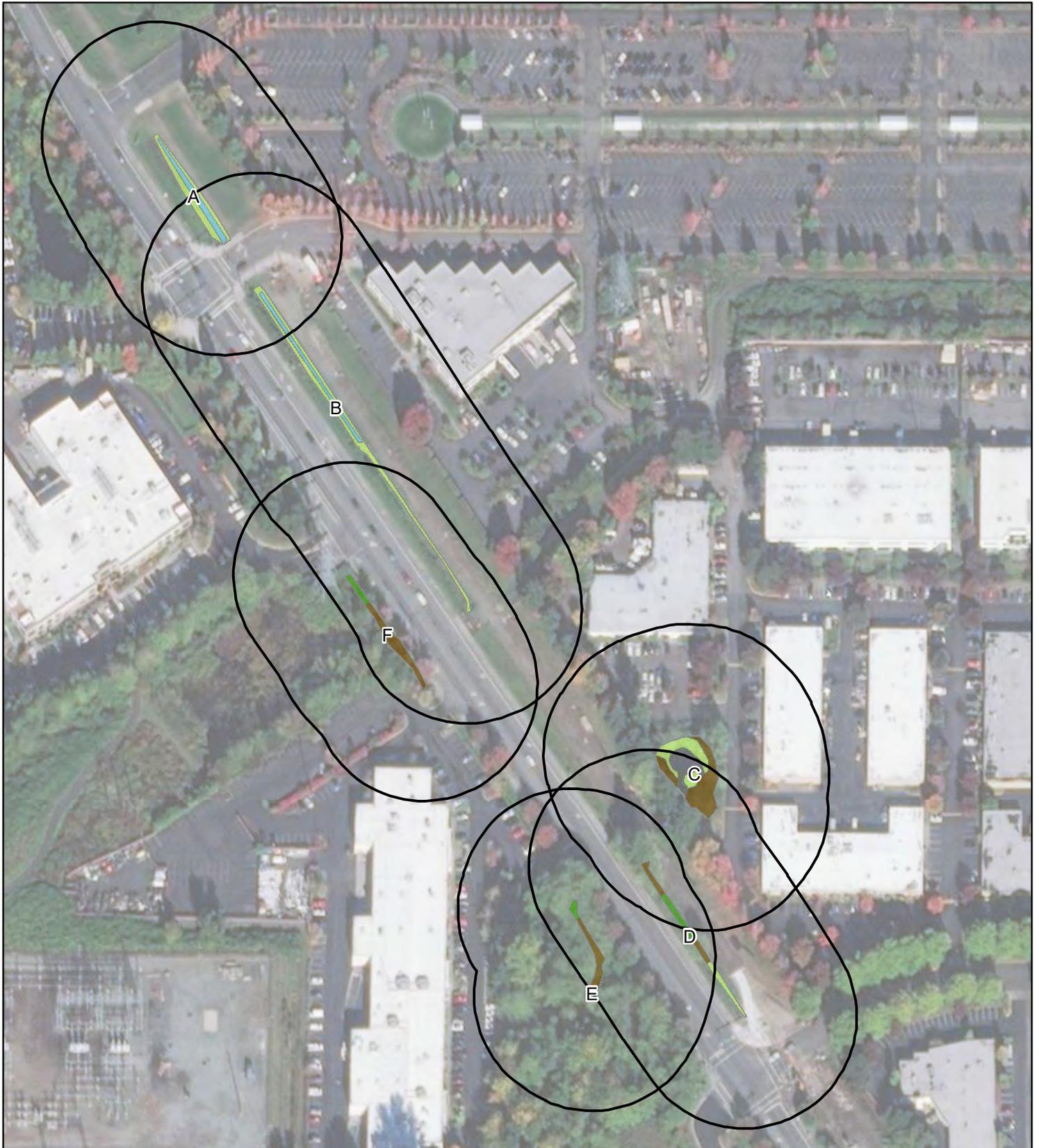
Wetland name or number D

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>	
<p>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</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = Category I No - Go to SC 1.2</p>	Cat. I
<p>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. Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>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? 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</p>	Cat. I
<p>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. 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</p>	Cat. I

Wetland name or number D

<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>	<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 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 un-mowed grassland. — The wetland is larger than 1/10 ac (4350 ft²) <p style="text-align: right;">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 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>	<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>	<p>N/A</p>

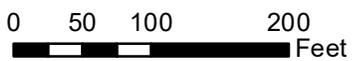
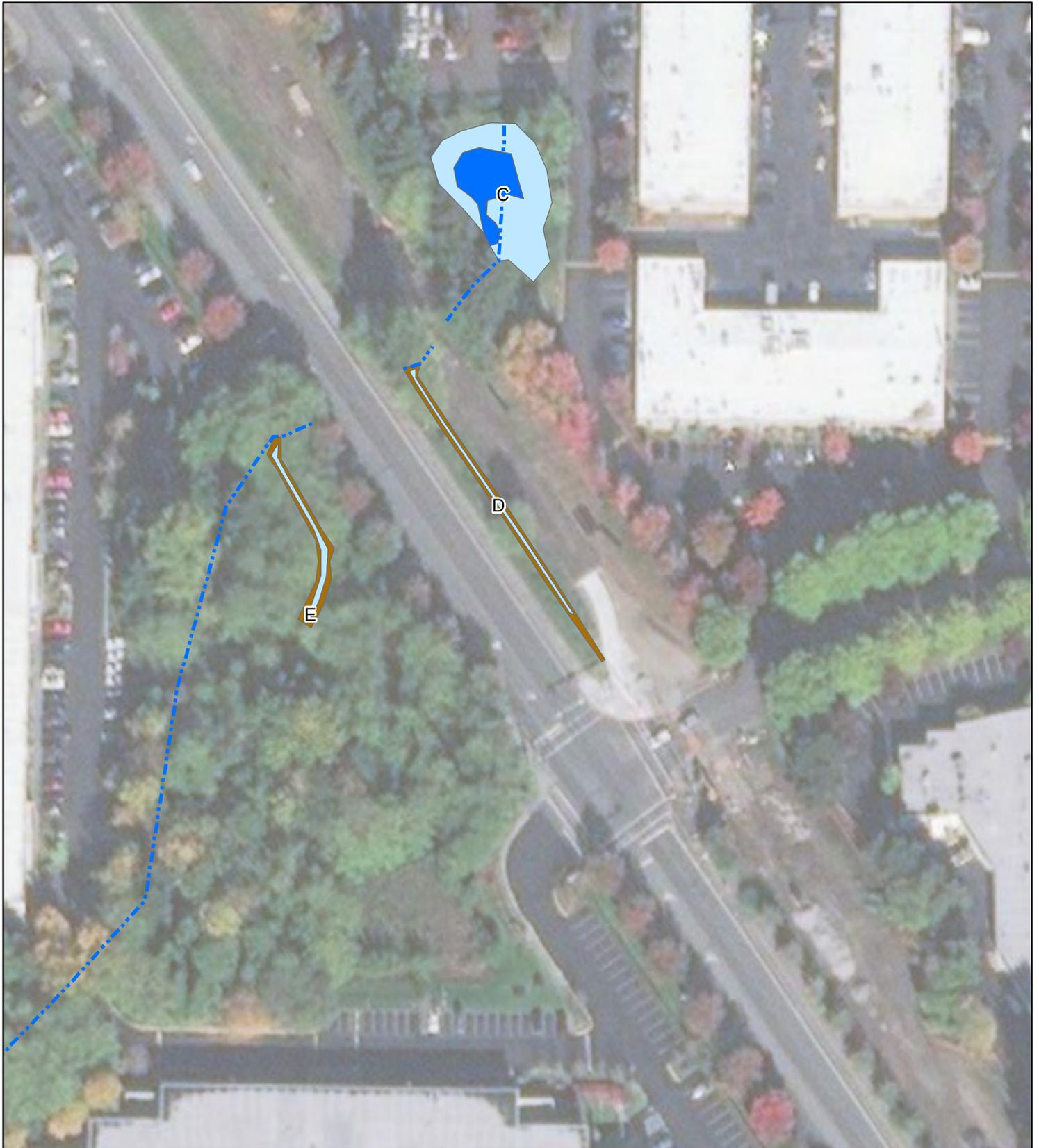


Cowardin Class  150ft polygon

-  Aquatic Bed
-  Emergent
-  Scrub-Shrub
-  Forested

Wetlands A through F Cowardin Classes

Willows Road Project
City of Redmond



- · - · - Stream
- Hydroperiod Type**
- Permanently Flooded
- Seasonally Flooded
- Occasionally Flooded
- Saturated Only

Wetlands C, D, & E Hydroperiods

Willows Road Project
City of Redmond



0 550 1,100 2,200
Feet

-  Wetland
-  1 km Buffer

Wetland D 1 Kilometer Buffer

Willows Road Project
City of Redmond

Add or remove map data

Assessed Waters/Sediment

Water

Category 5 - 303d

Category 4C

Category 4B

Category 4A

Category 2

Category 1

Sediment

Category 5 - 303d

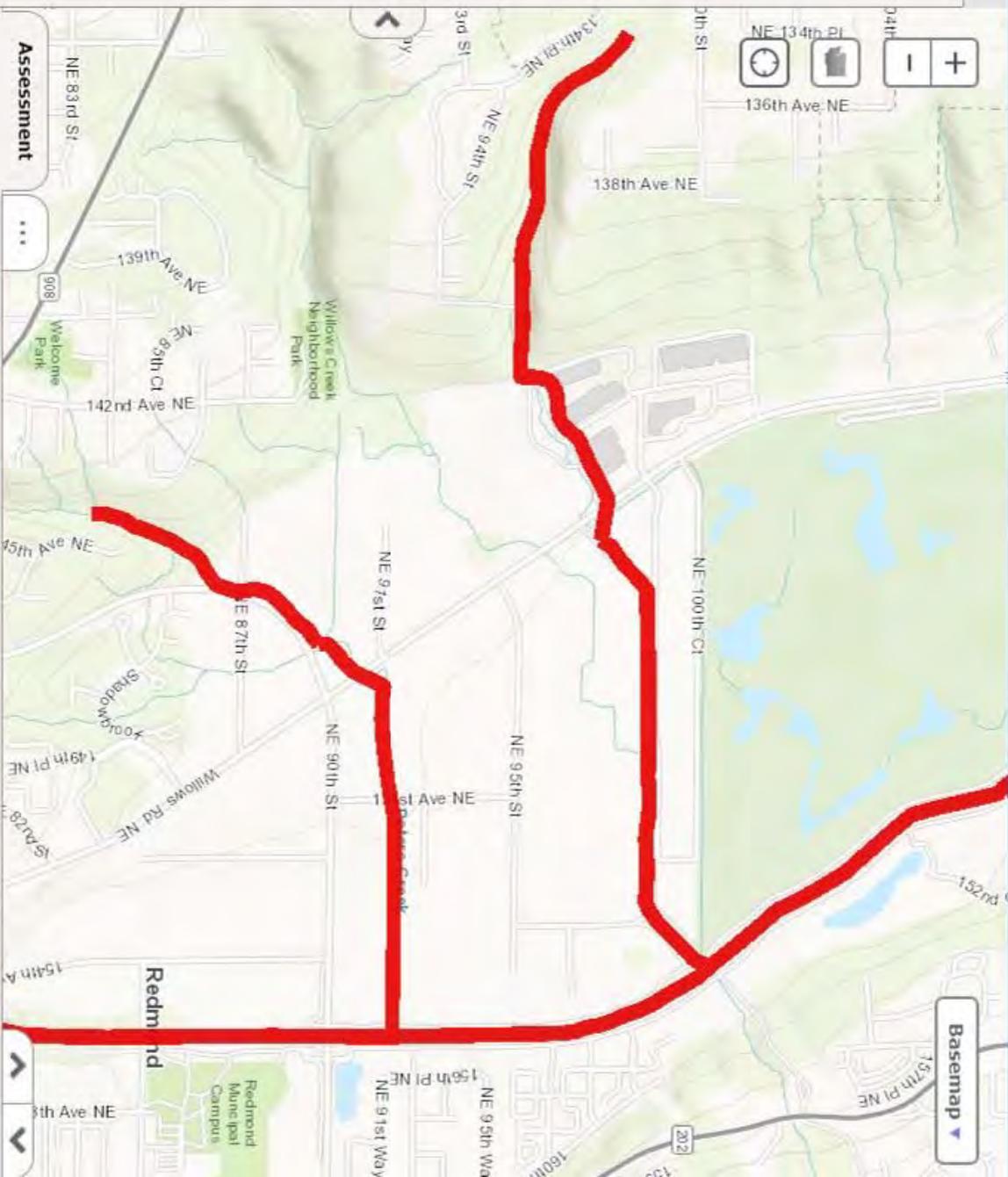
Category 4C

Category 4B

Category 4A

Category 2

Category 1



Water Quality Improvement Projects (TMDLs)

[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > [WRIA 8: Cedar-Sammamish](#)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- [King](#)
- [Snohomish](#)



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrcek 425-649-7165
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Project is under development	Ralph Svrcek 425-649-7165
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165

** Status will be listed as one of the following: *Approved by EPA, Under Development or Implementation*

For more information about WRIA 8:

- [Waterbodies in WRIA 8](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 8](#)

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

[Back to top of page](#)

Wetland name or number E

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland E Date of site visit: 12-5-17

Rated by Adam Merrill Trained by Ecology? Yes No Date of training 2014

HGM Class used for rating Slope 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 III (based on functions or special characteristics)

1. Category of wetland based on FUNCTIONS

Category I – Total score = 23 - 27

Category II – Total score = 20 - 22

Category III – Total score = 16 - 19

Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality		Hydrologic		Habitat					
<i>Circle the appropriate ratings</i>										
Site Potential	H	M	L	H	M	L	H	M	L	
Landscape Potential	H	M	L	H	M	L	H	M	L	
Value	H	M	L	H	M	L	H	M	L	TOTAL
Score Based on Ratings	6		5		6		17			

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

9 = H,H,H

8 = H,H,M

7 = H,H,L

7 = H,M,M

6 = H,M,L

6 = M,M,M

5 = H,L,L

5 = M,M,L

4 = M,L,L

3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

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

Wetland name or number E

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 E

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 E

SLOPE WETLANDS

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

S 1.0. Does the site have the potential to improve water quality?		
S 1.1. Characteristics of the average slope of the wetland: <i>(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)</i> Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% points = 1 Slope is greater than 5% points = 0	1	
S 1.2. <u>The soil 2 in below the surface (or duff layer)</u> is true clay or true organic (use NRCS definitions): Yes = 3 No = 0	0	
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. <i>Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.</i> Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	3	
Total for S 1	Add the points in the boxes above	4

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

Record the rating on the first page

S 2.0. Does the landscape have the potential to support the water quality function of the site?		
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1	
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources <u>vehicle exhaust particulates</u> Yes = 1 No = 0	1	
Total for S 2	Add the points in the boxes above	2

Rating of Landscape Potential If score is: **X 1-2** = M 0 = L

Record the rating on the first page

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

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

Record the rating on the first page

Wetland name or number E

SLOPE WETLANDS

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

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

S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.*
 Dense, uncut, **rigid** plants cover > 90% of the area of the wetland
 All other conditions

points = 1
 points = 0

0

Rating of Site Potential If score is: 1 = M X 0 = L

Record the rating on the first page

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

S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff?
 Yes = 1 No = 0

Yes = 1 No = 0

1

Rating of Landscape Potential If score is: X 1 = M ___ 0 = L

Record the rating on the first page

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

S 6.1. Distance to the nearest areas downstream that have flooding problems:

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

points = 2
 points = 1
 points = 0

1

S 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 S 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

NOTES and FIELD OBSERVATIONS:

Wetland name or number E

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

- Aquatic bed 4 structures or more: points = 4
 - Emergent 3 structures: points = 2
 - Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1
 - 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*).

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

2

H 1.3. Richness of plant species

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

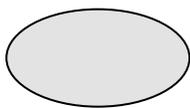
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

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

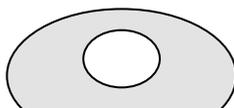
1

H 1.4. Interspersion of habitats

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



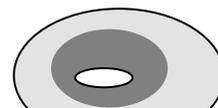
None = 0 points



Low = 1 point

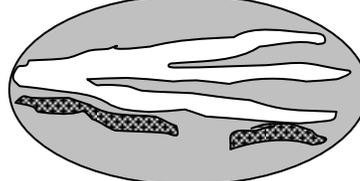
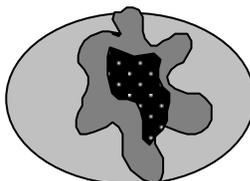
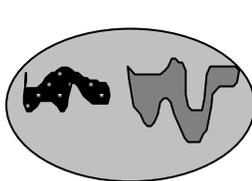


Moderate = 2 points



2

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



Wetland name or number E

<p>H 1.5. Special habitat features:</p> <p>Check the habitat features that are present in the wetland. <i>The number of checks is the number of points.</i></p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (> 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 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 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>	2
<p>Total for H 1</p>	<p>Add the points in the boxes above</p> <p>9</p>

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

<p>H 2.0. Does the landscape have the potential to support the habitat functions of the site?</p>	
<p>H 2.1. Accessible habitat (include <i>only habitat that directly abuts wetland unit</i>).</p> <p><i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u> %</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>	0
<p>H 2.2. Undisturbed habitat in 1 km Polygon around the wetland.</p> <p><i>Calculate:</i> % undisturbed habitat <u> </u> + [(% moderate and low intensity land uses)/2] <u> </u> = <u> </u> %</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>	1
<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>	-2
<p>Total for H 2</p>	<p>Add the points in the boxes above</p> <p>-1</p>

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

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

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

Wetland name or number E

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.

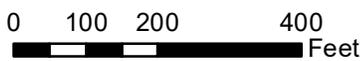
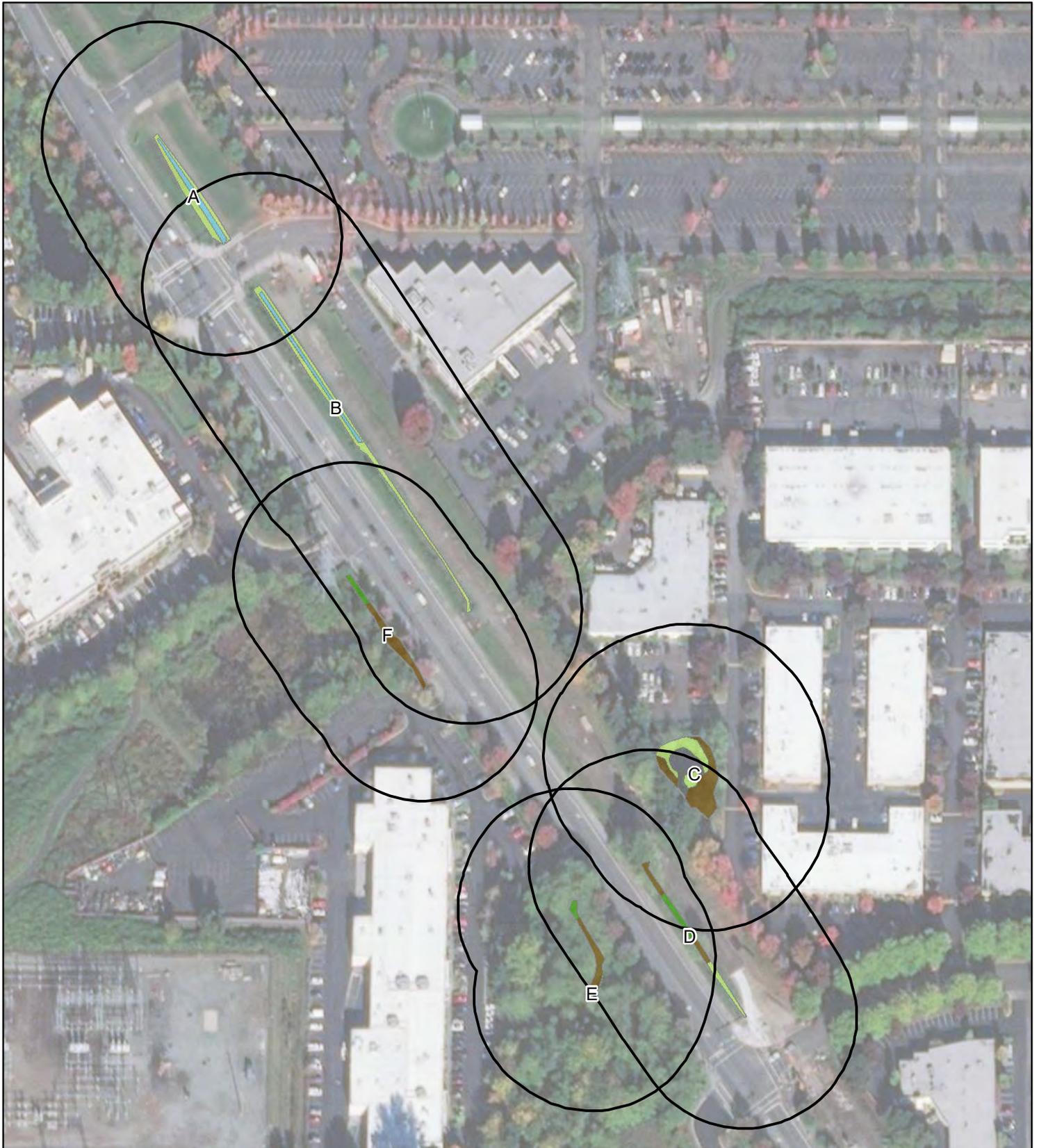
Wetland name or number E

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>	
<p>SC 1.0. Estuarine wetlands</p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <p style="text-align: right;">Yes – Go to SC 1.1 No = Not an estuarine wetland</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p style="text-align: right;">Yes = Category I No - Go to SC 1.2</p>	Cat. I
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two 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 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 2.0. Wetlands of High Conservation Value (WHCV)</p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;">Yes – Go to SC 2.2 No – Go to SC 2.3</p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p> <p>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</p> <p style="text-align: right;">Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV</p> <p>SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p>	Cat. I
<p>SC 3.0. Bogs</p> <p>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></p> <p>SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No – Go to SC 3.2</p> <p>SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No = Is not a bog</p> <p>SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?</p> <p style="text-align: right;">Yes = Is a Category I bog No – Go to SC 3.4</p> <p>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.</p> <p>SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?</p> <p style="text-align: right;">Yes = Is a Category I bog No = Is not a bog</p>	Cat. I

Wetland name or number E

<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>	<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 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>	<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 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>	<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>	<p>N/A</p>

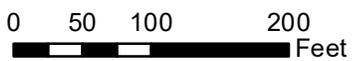
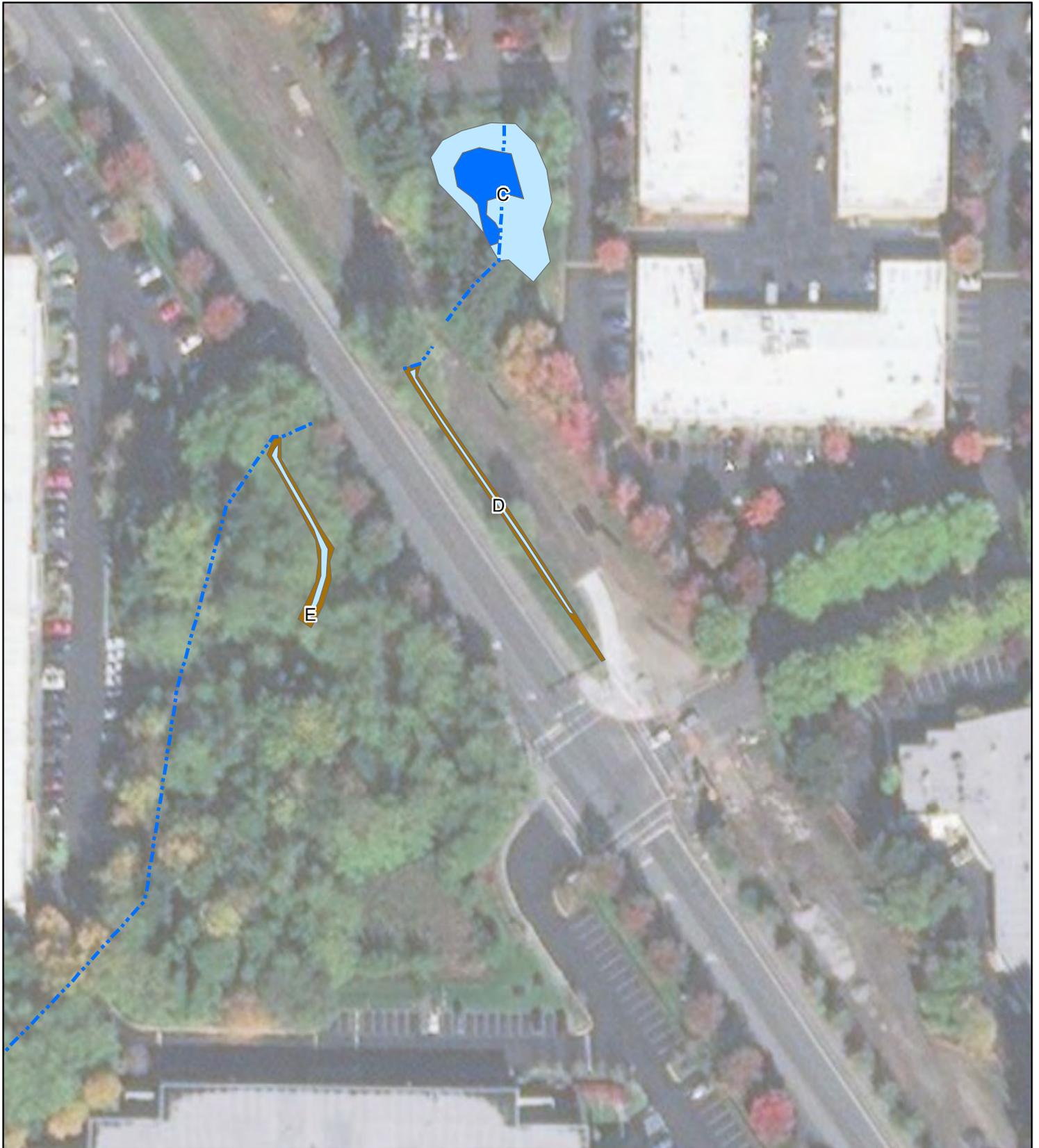


Cowardin Class  150ft polygon

-  Aquatic Bed
-  Emergent
-  Scrub-Shrub
-  Forested

Wetlands A through F Cowardin Classes

Willows Road Project
City of Redmond



- · - · - Stream
- Hydroperiod Type**
- Permanently Flooded
- Seasonally Flooded
- Occasionally Flooded
- Saturated Only

Wetlands C, D, & E Hydroperiods

Willows Road Project
City of Redmond



-  Wetland
-  1 km Buffer

Wetland E 1 Kilometer Buffer

Willows Road Project
City of Redmond

 Add or remove map data

Assessed Waters/Sediment 

Water

 Category 5 - 303d

 Category 4C

 Category 4B

 Category 4A

 Category 2

 Category 1

Sediment

 Category 5 - 303d

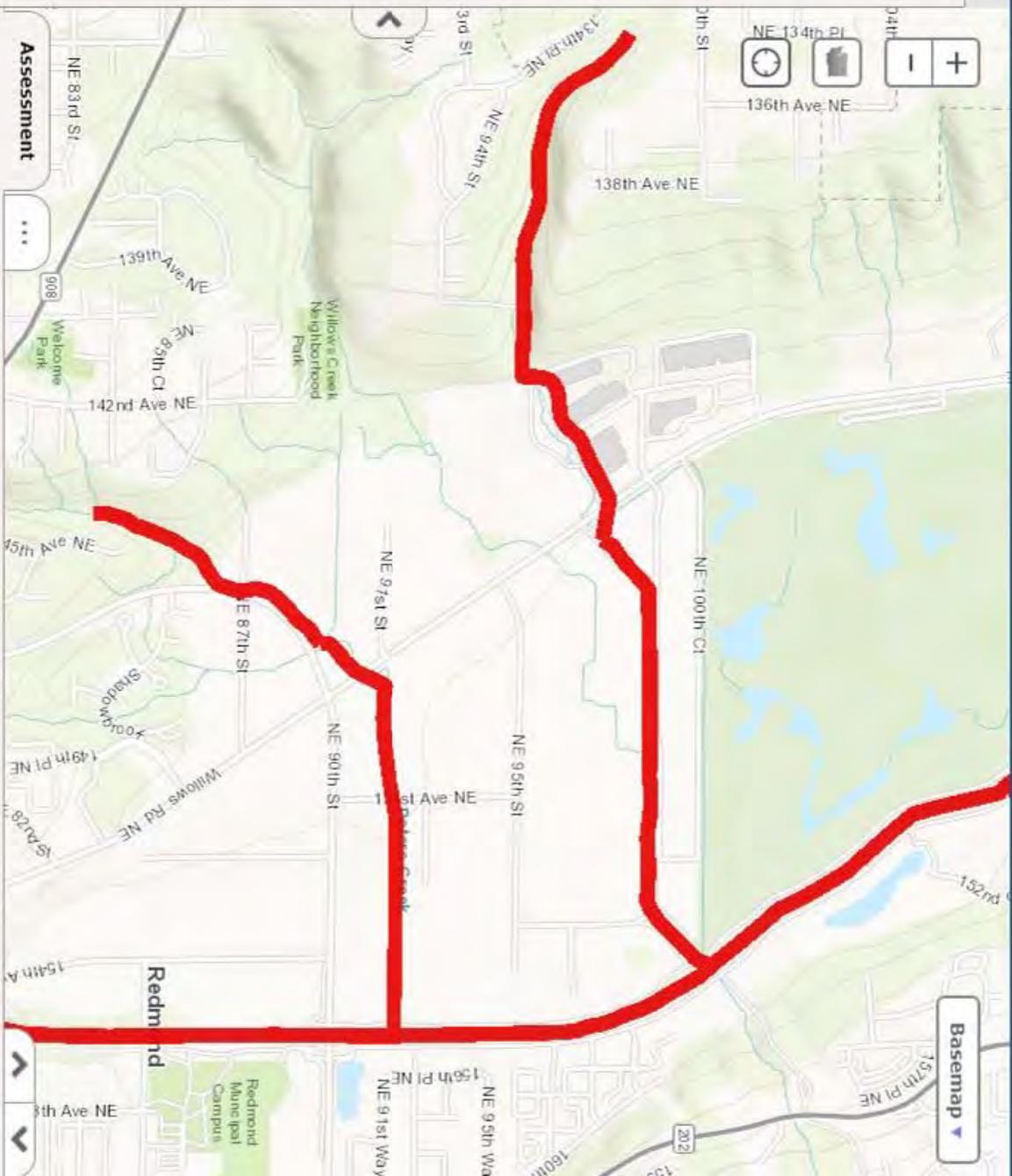
 Category 4C

 Category 4B

 Category 4A

 Category 2

 Category 1



Zoom to selection

Export to csv

Assessment

...

Find

Listing ID

Assessment Unit ID

Category

Medium

Parameter

Details

Water Quality Improvement Projects (TMDLs)

[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > [WRIA 8: Cedar-Sammamish](#)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- [King](#)
- [Snohomish](#)



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrcek 425-649-7165
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Project is under development	Ralph Svrcek 425-649-7165
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165

** Status will be listed as one of the following: *Approved by EPA, Under Development or Implementation*

For more information about WRIA 8:

- [Waterbodies in WRIA 8](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 8](#)

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Wetland name or number F

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland F Date of site visit: 12-5-17
 Rated by Adam Merrill Trained by Ecology? X Yes ___ No Date of training 2014
 HGM Class used for rating Slope Wetland has multiple HGM classes? ___ Y X N

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

OVERALL WETLAND CATEGORY IV (based on functions X 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
- X Category IV – Total score = 9 - 15

FUNCTION	Improving Water Quality		Hydrologic		Habitat					
	<i>Circle the appropriate ratings</i>									
Site Potential	H	M	<u>L</u>	H	M	<u>L</u>	H	M	<u>L</u>	
Landscape Potential	H	<u>M</u>	L	H	<u>M</u>	L	H	M	<u>L</u>	
Value	<u>H</u>	M	L	H	<u>M</u>	L	H	<u>M</u>	L	TOTAL
Score Based on Ratings	6		5		4		15			

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
<u>None of the above</u>	

Wetland name or number F

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 F

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 F

SLOPE WETLANDS

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

S 1.0. Does the site have the potential to improve water quality?		
S 1.1. Characteristics of the average slope of the wetland: <i>(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)</i>		
Slope is 1% or less	points = 3	1
Slope is > 1%-2%	points = 2	
Slope is > 2%-5%	points = 1	
Slope is greater than 5%	points = 0	
S 1.2. <u>The soil 2 in below the surface (or duff layer)</u> is true clay or true organic <i>(use NRCS definitions)</i> : Yes = 3 No = 0		0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. <i>Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.</i>		
Dense, uncut, herbaceous plants > 90% of the wetland area	points = 6	3
Dense, uncut, herbaceous plants > ½ of area	points = 3	
Dense, woody, plants > ½ of area	points = 2	
Dense, uncut, herbaceous plants > ¼ of area	points = 1	
Does not meet any of the criteria above for plants	points = 0	
Total for S 1	Add the points in the boxes above	4

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

Record the rating on the first page

S 2.0. Does the landscape have the potential to support the water quality function of the site?		
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants?	Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources <u>vehicle exhaust particulates</u>	Yes = 1 No = 0	1
Total for S 2	Add the points in the boxes above	2

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

Record the rating on the first page

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

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

Record the rating on the first page

Wetland name or number F

SLOPE WETLANDS

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

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

<p>S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. <i>Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.</i> Dense, uncut, rigid plants cover > 90% of the area of the wetland All other conditions</p>	<p>0</p>
---	----------

points = 1
 points = 0

Rating of Site Potential If score is: 1 = M 0 = L

Record the rating on the first page

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

<p>S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff?</p>	<p>1</p>
--	----------

Yes = 1 No = 0

Rating of Landscape Potential If score is: 1 = M 0 = L

Record the rating on the first page

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

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

points = 2
 points = 1
 points = 0

Yes = 2 No = 0

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

Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

Wetland name or number F

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS - Indicators that site functions to provide important habitat

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

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

- Aquatic bed 4 structures or more: points = 4
 - Emergent 3 structures: points = 2
 - Scrub-shrub (areas where shrubs have > 30% cover) 2 structures: points = 1
 - 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

1

H 1.2. Hydroperiods

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

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

1

H 1.3. Richness of plant species

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

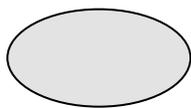
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species. Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle

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

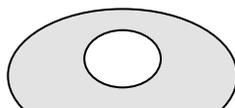
1

H 1.4. Interspersion of habitats

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



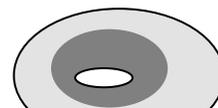
None = 0 points



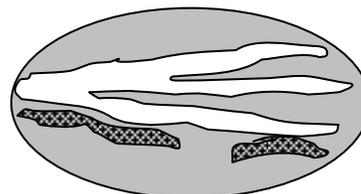
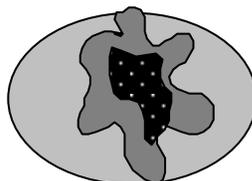
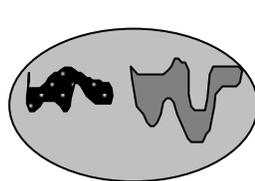
Low = 1 point



Moderate = 2 points



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



1

Wetland name or number F

<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> <input 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 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 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>) <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>		2
Total for H 1	Add the points in the boxes above	6

Rating of Site Potential If score is: 15-18 = H 7-14 = M X 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>). <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</p>		0
<p>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</p>		1
<p>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</p>		-2
Total for H 2	Add the points in the boxes above	-1

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

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

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

Wetland name or number F

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.

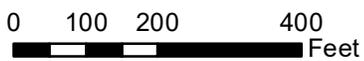
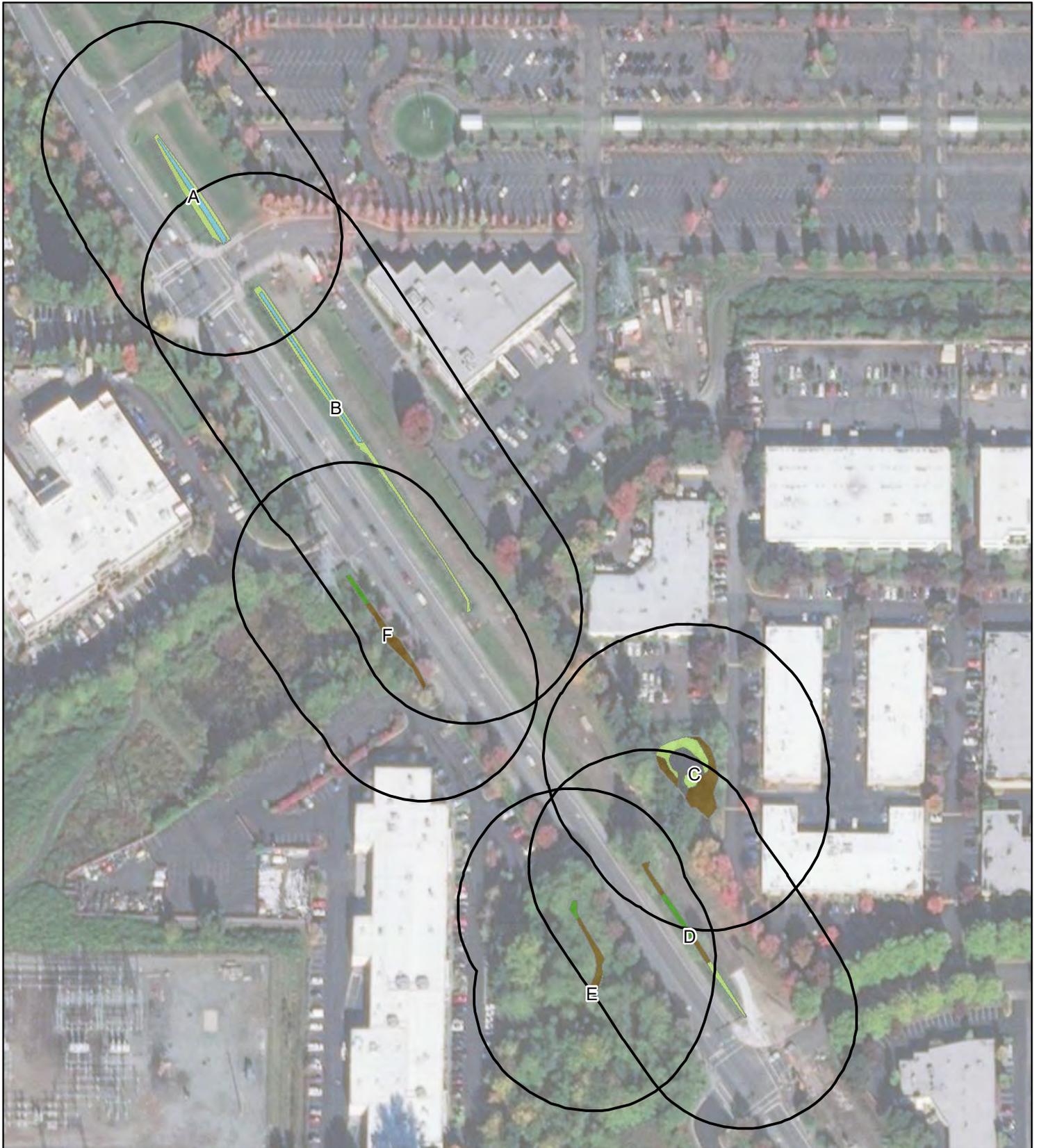
Wetland name or number F

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>	
<p>SC 1.0. Estuarine wetlands</p> <p>Does the wetland meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt <p style="text-align: right;">Yes – Go to SC 1.1 No = Not an estuarine wetland</p>	
<p>SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p style="text-align: right;">Yes = Category I No - Go to SC 1.2</p>	Cat. I
<p>SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two 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 10% cover of non-native plant species. (If non-native species are <i>Spartina</i>, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or unmowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. <p style="text-align: right;">Yes = Category I No = Category II</p>	Cat. I Cat. II
<p>SC 2.0. Wetlands of High Conservation Value (WHCV)</p> <p>SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value?</p> <p style="text-align: right;">Yes – Go to SC 2.2 No – Go to SC 2.3</p> <p>SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p> <p>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</p> <p style="text-align: right;">Yes – Contact WNHP/WDNR and go to SC 2.4 No = Not a WHCV</p> <p>SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website?</p> <p style="text-align: right;">Yes = Category I No = Not a WHCV</p>	Cat. I
<p>SC 3.0. Bogs</p> <p>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></p> <p>SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No – Go to SC 3.2</p> <p>SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond?</p> <p style="text-align: right;">Yes – Go to SC 3.3 No = Is not a bog</p> <p>SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4?</p> <p style="text-align: right;">Yes = Is a Category I bog No – Go to SC 3.4</p> <p>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.</p> <p>SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy?</p> <p style="text-align: right;">Yes = Is a Category I bog No = Is not a bog</p>	Cat. I

Wetland name or number F

<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>	<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 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 un-mowed grassland. — The wetland is larger than 1/10 ac (4350 ft²) <p style="text-align: right;">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 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>	<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>	<p>N/A</p>

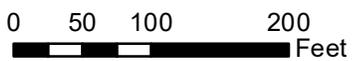


Cowardin Class  150ft polygon

-  Aquatic Bed
-  Emergent
-  Scrub-Shrub
-  Forested

Wetlands A through F Cowardin Classes

Willows Road Project
City of Redmond



- - - - Stream
- Hydroperiod Type**
- Permanently Flooded
- Seasonally Flooded
- Occasionally Flooded
- Saturated Only

Wetlands A, B, & F Hydroperiods

Willows Road Project
City of Redmond



Redmond



0 550 1,100 2,200
Feet

-  Wetland
-  1 km Buffer

Wetland F 1 Kilometer Buffer

Willows Road Project
City of Redmond

Add or remove map data

Assessed Waters/Sediment

Water

Category 5 - 303d

Category 4C

Category 4B

Category 4A

Category 2

Category 1

Sediment

Category 5 - 303d

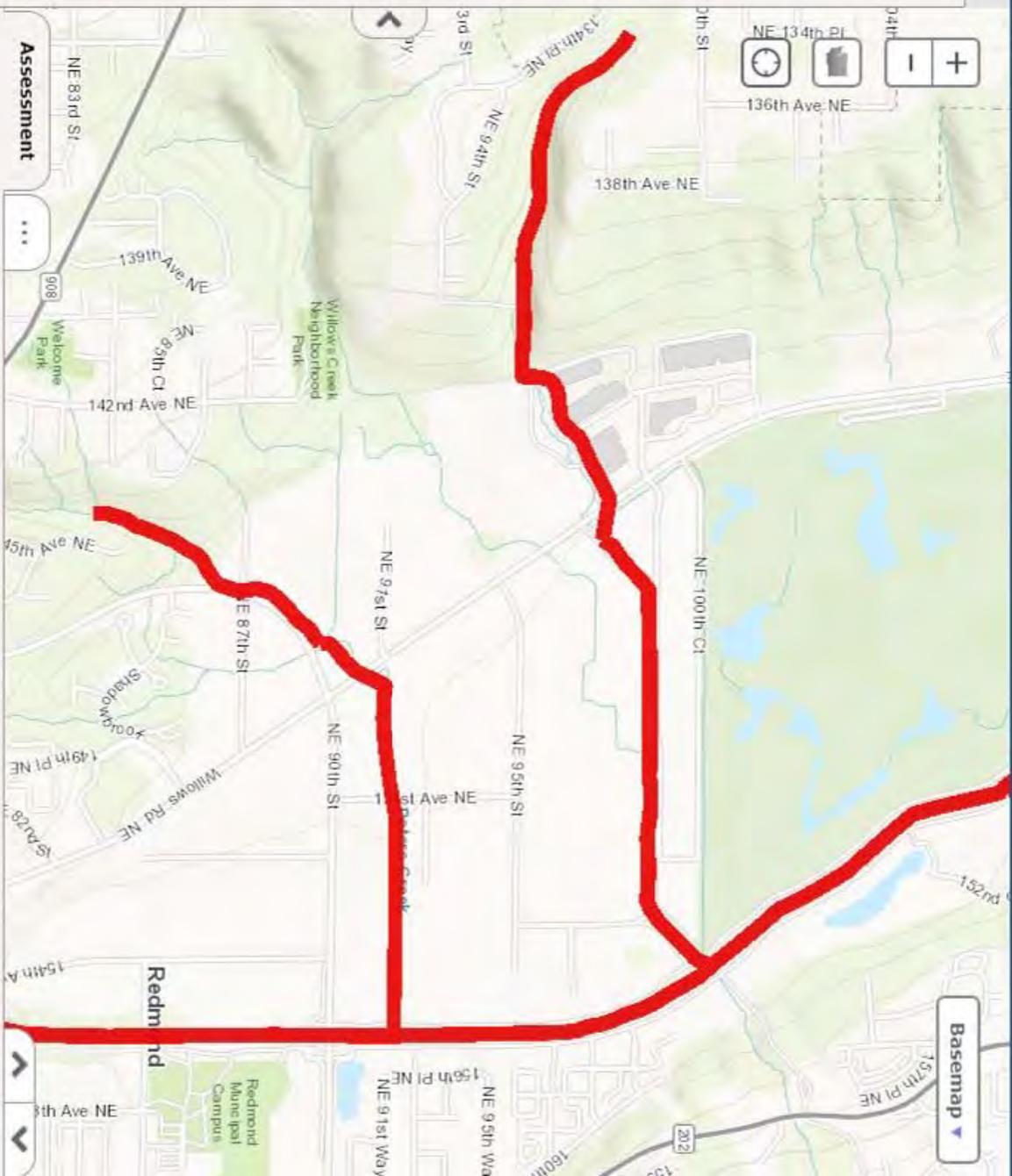
Category 4C

Category 4B

Category 4A

Category 2

Category 1



Zoom to selection

Export to csv

Assessment

...

Find

Listing ID

Assessment Unit ID

Category

Medium

Parameter

Details

Basemap

Water Quality Improvement Projects (TMDLs)

[Water Quality Improvement](#) > [Water Quality Improvement Projects by WRIA](#) > [WRIA 8: Cedar-Sammamish](#)

WRIA 8: Cedar-Sammamish

The following table lists overview information for water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Counties

- [King](#)
- [Snohomish](#)



Waterbody Name	Pollutants	Status**	TMDL Lead
Ballinger Lake	Total Phosphorus	Approved by EPA	Tricia Shoblom 425-649-7288
Bear-Evans Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
	Dissolved Oxygen Temperature	Approved by EPA	
Cottage Lake	Total Phosphorus	Approved by EPA Has an implementation plan	Tricia Shoblom 425-649-7288
Issaquah Creek Basin	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Little Bear Creek Tributaries: Trout Stream Great Dane Creek Cutthroat Creek	Fecal Coliform	Approved by EPA	Ralph Svrcek 425-649-7165
North Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165
Pipers Creek	Fecal Coliform	Approved by EPA	Joan Nolan 425-649-4425
Sammamish River	Dissolved Oxygen Temperature	Project is under development	Ralph Svrcek 425-649-7165
Swamp Creek	Fecal Coliform	Approved by EPA Has an implementation plan	Ralph Svrcek 425-649-7165

** Status will be listed as one of the following: Approved by EPA, Under Development or Implementation

For more information about WRIA 8:

- [Waterbodies in WRIA 8](#) - using the Water Quality Assessment Query Tool
- [Watershed Information for WRIA 8](#)

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

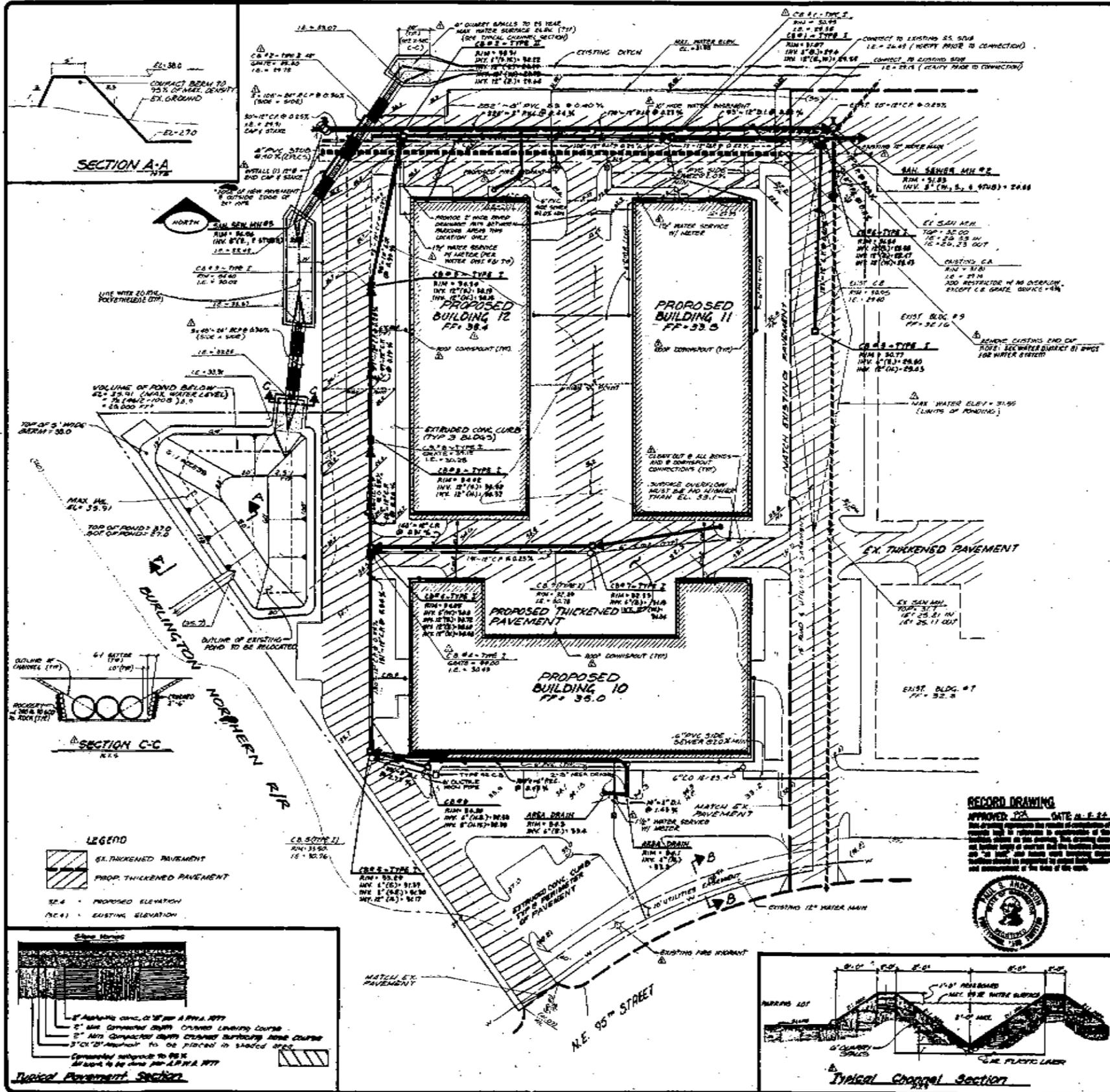
[Back to top of page](#)

Appendix E

Stormwater Facility As-Built Plans (Wetlands C, E, and F)



ORIGINAL DESIGN PLAN



GENERAL NOTES

- ALL WORK, MATERIALS AND CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE PLANS, SPECIAL PROVISIONS, THE STANDARD SPECIFICATIONS FOR MUNICIPAL WORKS CONSTRUCTION, APRIL 1977 AND THE CITY OF REDMOND DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS. UTILITIES, EXISTING GRADES AND EXISTING STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY AND ARE LOCATED FROM THE BEST INFORMATION MADE AVAILABLE BY THE VARIOUS AGENCIES INVOLVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL GRADE AND LOCATION OF EXISTING UTILITIES AND STRUCTURES SO AS TO AVOID DAMAGE OR DISTURBANCE. SHOULD ANY DISCREPANCY OR CONFLICT ARISE, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY PRIOR TO PROCEEDING ANY FURTHER WITH CONSTRUCTION.
- PROVIDE AND MAINTAIN TEMPORARY SEDIMENTATION COLLECTION FACILITIES TO INSURE THAT EXISTING AND NEW DRAINAGE SYSTEMS ARE NOT CLOGGED OR DISTURBED. THESE FACILITIES MUST BE IN OPERATION PRIOR TO CLEARING AND BUILDING CONSTRUCTION, AND SATISFACTORILY MAINTAINED UNTIL CONSTRUCTION AND LANDSCAPING ARE COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED.
- ALL DISTURBED AREAS SHALL BE GRASS SEEDING. GRASS SEEDINGS WILL BE DONE USING AN APPROVED TYPE HYBRID SEEDER, OR AS OTHERWISE APPROVED BY PUBLIC WORKS.
- IT SHALL BE THE RESPONSIBILITY OF THE OWNER AND/OR CONTRACTOR TO OBTAIN ALL NECESSARY PERMITS, EASEMENTS AND/OR RELEASES.
- ALL CATCH BASINS SHALL BE TYPE F-10 UNLESS NOTED OTHERWISE ON THE PLAN. ALL TYPE I-C AND TYPE II-C CATCH BASINS SHALL CONFORM TO THE CITY OF REDMOND STANDARD DETAILS.
- TYPE I-A CATCH BASINS SHALL CONFORM TO REDMOND CONCRETE PRODUCTS STANDARD DETAIL FOR (E-14).
- ALL ROOF DOWNSPOUTS SHALL BE TYPED TO THE STORM DRAINAGE SYSTEM.
- PROVIDE 12" MINIMUM COVER OVER STORM MAINS, CATCH BASIN, FRAME AND GRATES SHALL CONFORM TO CITY OF REDMOND STANDARD DETAILS.
- ALL GRATES SHALL BE DERESSED 0.05 FEET BELOW PAVEMENT LEVEL. DO NOT ADJUST UNITS AND CATCH BASIN FRAMES AND GRATES, MAN-HOLE RIMS AND VALVE BODIES UNTIL JUST PRIOR TO PAVING.
- WHERE NEW PAVING MEET EXISTING PAVEMENT, THE CONNECTION SHALL BE SQUARE CUT IN A STRAIGHT LINE AND ALL DEBRIS REMOVED PRIOR TO CONSTRUCTION. A TACK COAT (PERFECT) SHALL BE APPLIED TO INSURE PROPER SEALING AND WATER-TIGHTNESS.
- SIDE SEWER AND WATER SERVICES SHALL NOT BE CONSTRUCTED WITHOUT BUILDING CORNERS AND SPACES BEING SET. THE PRECISE CONNECTION POINTS AT THE BUILDING FOR THE WATER AND SEWER SERVICES SHALL BE DETERMINED BY THE PROJECT ARCHITECT.
- ROOF RIP RAP SHALL MEET THE SPECIFICATIONS AS SET FORTH IN SECTIONS 12-1.1 AND 12-1.2 OF THE STATE OF WASHINGTON STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, FOR LOOSE RIP RAP.
- FOR PROPOSED WATER MAIN SEE "WILLOWS INDUSTRIAL CENTER, WATER MAIN EXTENSION" PLAN PREPARED BY WATER SERVICE AND BE.
- CONCRETE DELIVERY PIPE SHALL CONFORM TO ASTM C-76 CLASS (E SPECIFICATIONS).
- DRAINAGE CHANNEL SHALL BE CONSTRUCTED PER 1982 ASH SPECIFICATION SECTION 12-3.3C, WITH A MINIMUM COEFFICIENT OF 90% OF THE MAXIMUM DENSITY.
- C-CHANNEL LIVING TO BE 6" QUARRY SPALLS IN LOWER FOOT. UPPER 3FT. TO BE FILLING SEEDED WITH RYE GRASS AND PERENNIAL GRASS AND CLOVER. GRASS TO BE COVERED WITH AMERICAN EXCELSDOR CO. "EROSION CONTROL BLANKET" OR OTHER APPROVED.
- ALL ROOF DRAIN SPOTS SHALL BE 6" MIN. AT D. 50FT. PIPES SHALL BE PVC (3" MIN. COVER) OR CPV (4") (3" MIN. COVER).

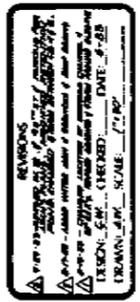
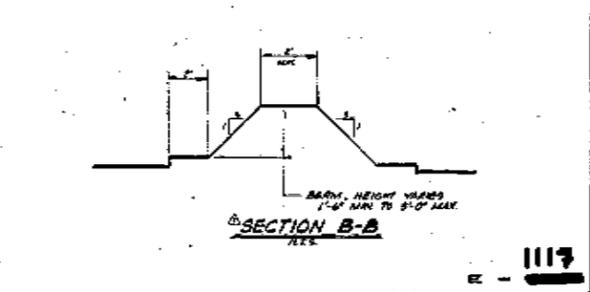
LEGAL DESCRIPTION

LOT 3 & 4 OF SHORT PLAT OF LOT 2 OF WILLOWS INDUSTRIAL CENTER PRESENTLY BEING REVIEWED BY THE CITY OF REDMOND.

SUBJECT TO AND TOGETHER WITH EASEMENTS, CONVEYANCES, CONDITIONS, RESTRICTIONS AND RESERVATIONS OF RECORD, IF ANY.

DATE _____

THIS APPROVAL IS FOR DESIGN CONCEPT ONLY. THESE PLANS APPLY TO BE IN CONFORMANCE WITH CITY OF REDMOND DESIGN STANDARDS FOR CONSTRUCTION. THIS APPROVAL SHALL NOT BE CONSIDERED AS AUTHORIZING CONSTRUCTION NOT IN ACCORDANCE WITH APPLICABLE CITY STANDARDS. THE CITY RESERVES THE RIGHT TO REQUIRE REVISIONS TO THE APPROVED PLANS TO ASSURE CONFORMANCE WITH CITY OF REDMOND DESIGN STANDARDS FOR CONSTRUCTION AT ANY TIME THAT IT IS DISCOVERED THE PROPOSED CONSTRUCTION DOES NOT OTHERWISE MEET THE APPLICABLE CONSTRUCTION STANDARDS. THE OWNER IS REQUIRED TO PROVIDE DESIGN AND PLANS IN ACCORDANCE WITH APPLICABLE CITY STANDARDS AND ASSURE THAT CONSTRUCTION IS ACCOMPLISHED IN ACCORDANCE WITH THOSE STANDARDS. THE OWNER AND/OR DESIGN ENGINEER AND/OR DEVELOPER AS THE CASE MAY BE, MAY BE REQUIRED TO MAKE NECESSARY APPROVED FIELD REVISIONS TO CORRECT ANY ERRORS OR OMISSIONS FOUND TO EXIST ON THE APPROVED PLAN.



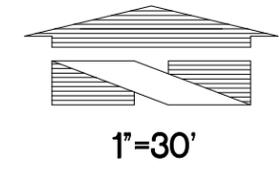
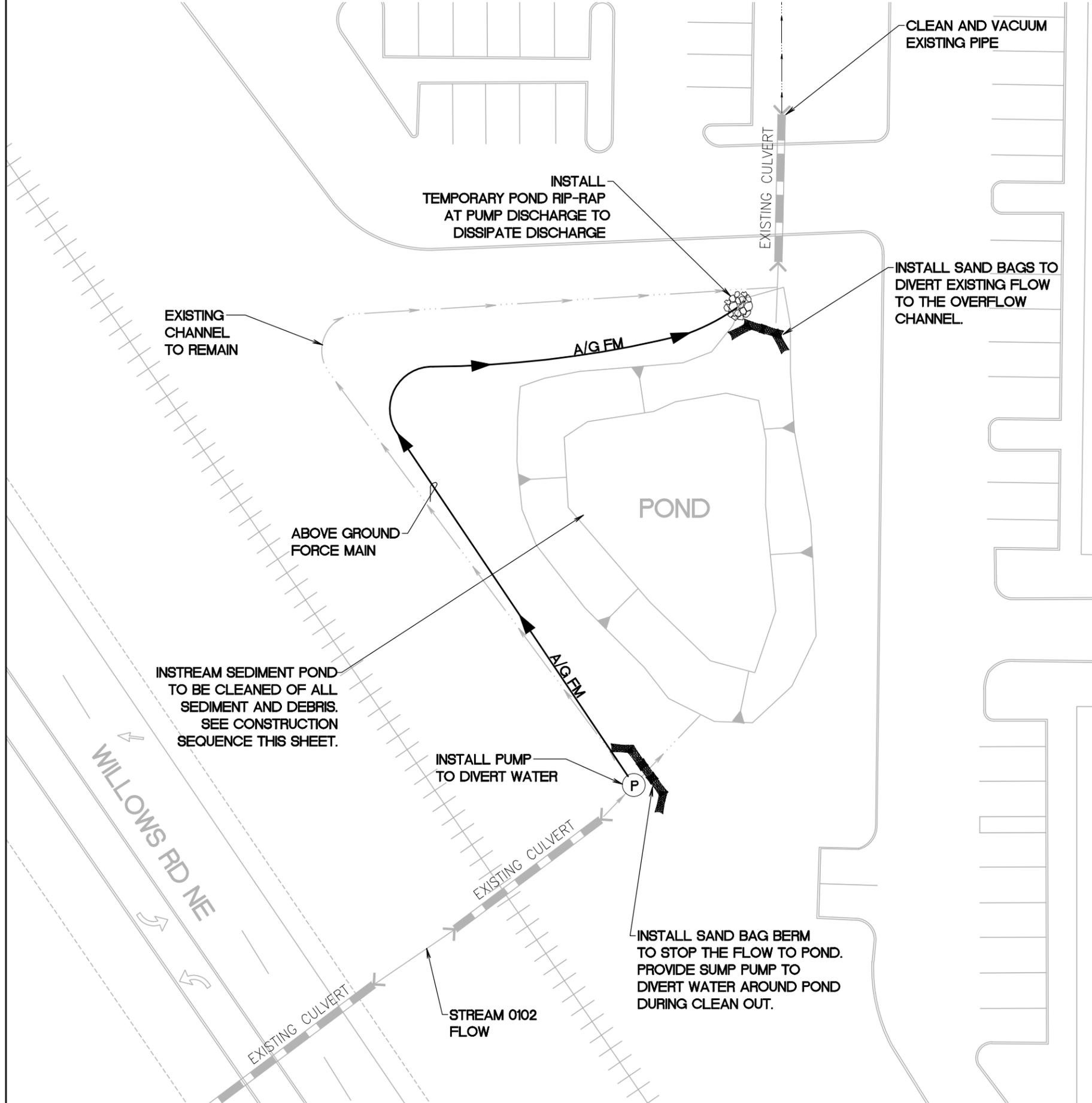
SITE IMPROVEMENT PLAN
WILLOWS INDUSTRIAL CENTER
LOTS 3 & 4 OF SHORT PLAT LOT 2
THE QUADRANT CORPORATION
MELLY, WASH. STATE

STERN & ASSOCIATES INC.
1400 S. 10th Street, Suite 100, Redmond, WA 98053
Phone: (425) 251-1100
Fax: (425) 251-1101

5/17
CI of 5
KIN 21 2/14 74

	Revision	Appr.	Ckd.	By	Date	No.
Job Number 17141	Title: WILLOW BUSINESS CENTER POND CLEANING EXHIBIT					
Sheet 2 of 3	For:					
Scale:	Horizontal AS	Vertical 1"=30'	Designed AS	Drawn JEP	Checked AS	Approved DB
Date 7/30/14	18215 72ND AVENUE SOUTH KENT, WA 98032 (425)251-6222 (425)251-8782 FAX CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES					

SEDIMENT REMOVAL PLAN



CONSTRUCTION SEQUENCING NOTES:

1. SCHEDULE A PRE-CONSTRUCTION MEETING WITH ALL APPROPRIATE AGENCIES AFTER ALL PERMITS ARE OBTAINED.
2. INSTALL SAND BAG BERM AT INLET OF CHANNEL TO POND.
3. PROVIDE DIVERSION PUMP TO PUMP STORM RUN OFF AROUND POND TO DOWN STREAM CHANNEL. INSURE TO HAVE ADEQUATE PUMP FOR THE AMOUNT OF FLOW AT TIME OF CONSTRUCTION.
4. INSTALL SANDBAGS TO BLOCK THE OUTFALL FROM THE POND AT THE NORTHEAST CORNER OF THE POND. ALLOW PASSAGE OF THE POND FLOW UNTIL THE LEVEL OF THE POND IS BELOW THE OUTFALL ELEVATION.
5. CAPTURE FISH AND TRANSPORT/RELEASE DOWNSTREAM PER DEPARTMENT OF FISH AND WILDLIFE REQUIREMENT.
6. PUMP DOWN THE TOP LEVEL OF CLEAR WATER USING A FILTER ON THE PUMP INLET FOR CAPTURING AND RELOCATING ANY FISH.
7. REMOVE SAND, SILT, DEBRIS, UNDERWATER VEGETATION AND INVASIVE VEGETATION USING VACTOR TRUCK. POSITION TRUCK IN THE PARKING LOT AND MANUALLY OPERATE THE HOSE INSIDE THE POND. STRETCH THE HOSE ACROSS GRASS AND POND PERIMETER TO MINIMIZE DAMAGE TO EXISTING VEGETATION.
8. DUMP THE REMOVED SAND/SILT INTO A TEMPORARY STORAGE-STAGING AREA. DEVELOP A STAGING AREA PLAN JOINTLY WITH THE PROPERTY OWNERS AND THE CITY OF REDMOND.
9. CLEAN INLET AND OUTLET CONCRETE PIPES. JET RODDING AS NECESSARY.
10. SECURE FINAL INSPECTION APPROVAL FROM THE CITY OF REDMOND ON ALL POND CLEANING WORK.
11. REOPEN THE STREAM TO NATURAL FLOW THROUGH THE POND BY REMOVING THE TEMPORARY SANDBAG DAMS.
12. DRAIN AND REMOVE THE WATER STORAGE TANK AND RELEASE CLEAR WATER IN THE APPROPRIATE/APPROVED LOCATION.
13. REMOVE ALL STOCKPILED SAND TO AN APPROVED OFFSITE LOCATION.
14. CLEAN ALL OPERATIONAL AND STORAGE AREAS TO THE SATISFACTION OF OWNERS AND THE CITY OF REDMOND.

Revision	
Appr.	
Ckd.	
By	
Date	
No.	

**Title: WILLOW BUSINESS CENTER
POND CLEANING EXHIBIT**

For:

Scale:	Horizontal	Vertical
Designed <u>AS</u>	Drawn <u>JEP</u>	Checked <u>AS</u>
Approved <u>DB</u>	Date <u>7/30/14</u>	

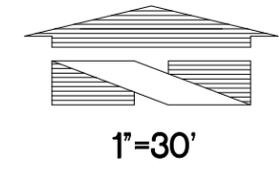
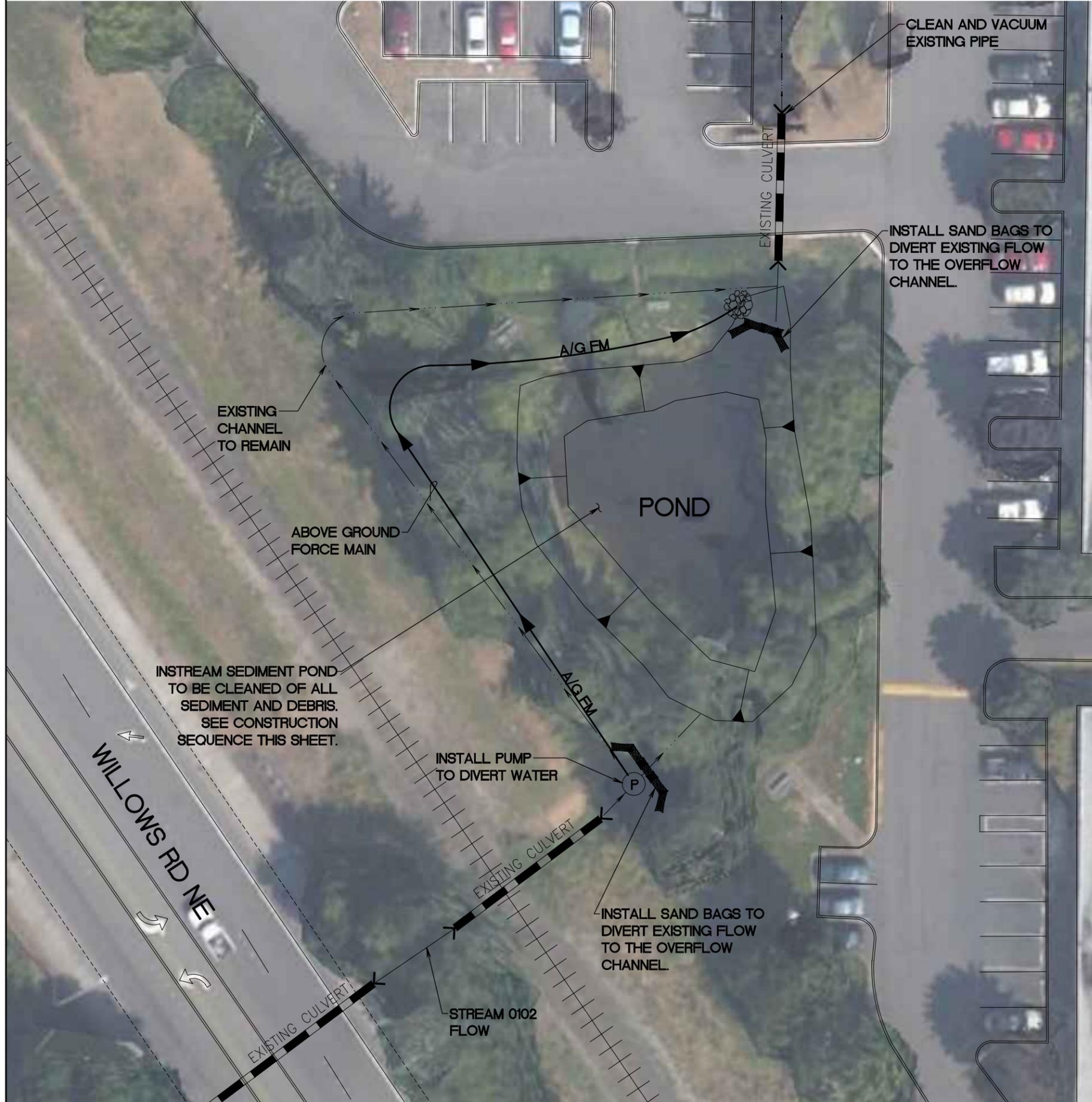
18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

BARC HAUSEN ENGINEERS, INC.
CONSULTING ENGINEERS

CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

Job Number	17141
Sheet	1 of 3

SEDIMENT REMOVAL PLAN - AERIAL OVERLAY



CONSTRUCTION SEQUENCING NOTES:

1. SCHEDULE A PRE-CONSTRUCTION MEETING WITH ALL APPROPRIATE AGENCIES AFTER ALL PERMITS ARE OBTAINED.
2. INSTALL SAND BAG BERM AT INLET OF CHANNEL TO POND.
3. PROVIDE DIVERSION PUMP TO PUMP STORM RUN OFF AROUND POND TO DOWN STREAM CHANNEL. INSURE TO HAVE ADEQUATE PUMP FOR THE AMOUNT OF FLOW AT TIME OF CONSTRUCTION.
4. INSTALL SANDBAGS TO BLOCK THE OUTFALL FROM THE POND AT THE NORTHEAST CORNER OF THE POND. ALLOW PASSAGE OF THE POND FLOW UNTIL THE LEVEL OF THE POND IS BELOW THE OUTFALL ELEVATION.
5. CAPTURE FISH AND TRANSPORT/RELEASE DOWNSTREAM PER DEPARTMENT OF FISH AND WILDLIFE REQUIREMENT.
6. PUMP DOWN THE TOP LEVEL OF CLEAR WATER USING A FILTER ON THE PUMP INLET FOR CAPTURING AND RELOCATING ANY FISH.
7. REMOVE SAND, SILT, DEBRIS, UNDERWATER VEGETATION AND INVASIVE VEGETATION USING VACTOR TRUCK. POSITION TRUCK IN THE PARKING LOT AND MANUALLY OPERATE THE HOSE INSIDE THE POND. STRETCH THE HOSE ACROSS GRASS AND POND PERIMETER TO MINIMIZE DAMAGE TO EXISTING VEGETATION.
8. DUMP THE REMOVED SAND/SILT INTO A TEMPORARY STORAGE-STAGING AREA. DEVELOP A STAGING AREA PLAN JOINTLY WITH THE PROPERTY OWNERS AND THE CITY OF REDMOND.
9. CLEAN INLET AND OUTLET CONCRETE PIPES. JET RODDING AS NECESSARY.
10. SECURE FINAL INSPECTION APPROVAL FROM THE CITY OF REDMOND ON ALL POND CLEANING WORK.
11. REOPEN THE STREAM TO NATURAL FLOW THROUGH THE POND BY REMOVING THE TEMPORARY SANDBAG DAMS.
12. DRAIN AND REMOVE THE WATER STORAGE TANK AND RELEASE CLEAR WATER IN THE APPROPRIATE/APPROVED LOCATION.
13. REMOVE ALL STOCKPILED SAND TO AN APPROVED OFFSITE LOCATION.
14. CLEAN ALL OPERATIONAL AND STORAGE AREAS TO THE SATISFACTION OF OWNERS AND THE CITY OF REDMOND.

Revision	
No.	Date
By	Ckd.
	Appr.

**Title: WILLOW BUSINESS CENTER
POND CLEANING EXHIBIT**

For:

Scale:	Horizontal
Scale:	Vertical
Designed <u>AS</u>	
Drawn <u>JEP</u>	
Checked <u>AS</u>	
Approved <u>DB</u>	
Date <u>7/30/14</u>	

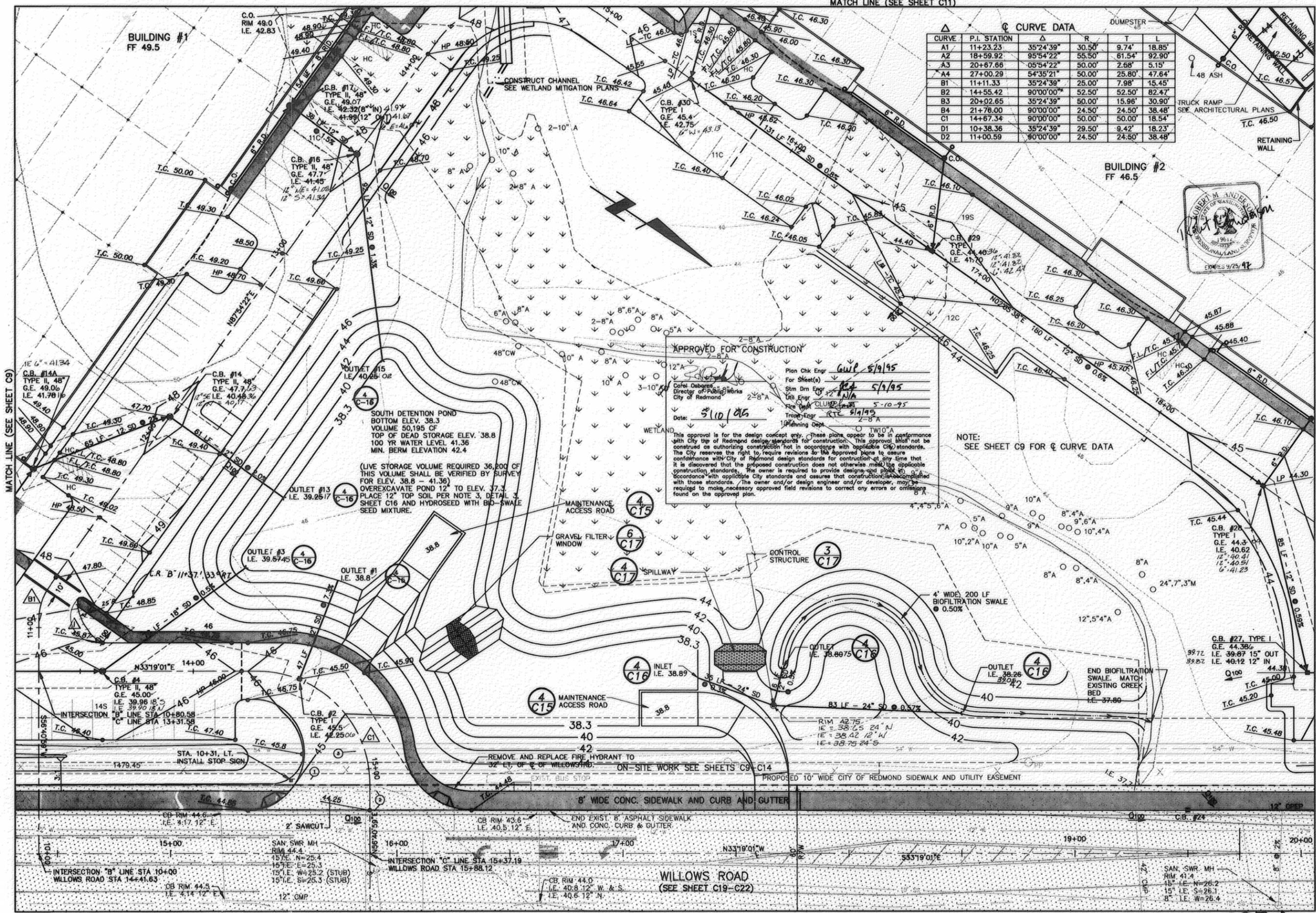
18215 72ND AVENUE SOUTH
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BARC HAUSEN ENGINEERS, INC.
CONSULTING ENGINEERS

CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

Job Number	17141
Sheet	3 of 3

MATCH LINE (SEE SHEET C11)



△ CURVE DATA

CURVE	P.I. STATION	Δ	R	T	L
A1	11+23.23	35°24'39"	30.50'	9.74'	18.85'
A2	18+59.92	95°54'22"	55.50'	61.54'	92.90'
A3	20+67.66	05°54'22"	50.00'	2.68'	5.15'
A4	27+00.29	54°35'21"	50.00'	25.80'	47.64'
B1	11+11.33	35°24'39"	25.00'	7.98'	15.45'
B2	14+55.42	90°00'00"	52.50'	52.50'	82.47'
B3	20+02.65	35°24'39"	60.00'	15.96'	30.90'
B4	21+78.00	90°00'00"	24.50'	24.50'	38.48'
C1	14+67.34	90°00'00"	50.00'	50.00'	18.54'
D1	10+38.36	35°24'39"	29.50'	9.42'	18.23'
D2	11+00.59	90°00'00"	24.50'	24.50'	38.48'

APPROVED FOR CONSTRUCTION

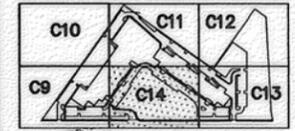
Plan Chk Engr *Gawl* 5/9/95
 For Sheet(s) *14*
 Stm Dm Engr *N/A* 5/9/95
 Lic Engr *N/A*
 Fire Engr *CLUMP* 5-10-95
 Trans Engr *RTC* 5/9/95
 Date: *5/10/95*

Carol Osborne
 Director of Public Works
 City of Redmond

NOTE: SEE SHEET C9 FOR Δ CURVE DATA

Opus Northwest Corporation
WILLOWS COMMERCE PARK
 Redmond, Washington

WIPACIFIC
 3025-112th Avenue N.E.
 P.O. Box C-97304
 Bellevue, WA 98008-9304



Professional Engineer
 License No. 19514
 Registered Professional Engineer
 State of Washington
 Expires 9/25/97

4-28-95

Professional Engineer
 License No. 19514
 Registered Professional Engineer
 State of Washington
 Expires 9/25/97

- LEGEND**
- △ PROPOSED EASEMENT
 - △ EXISTING EASEMENT
 - △ CURVE NO., SEE SHEET C10
 - △ PROPOSED CONC. SIDEWALK
 - 6" STORM SEWER CLEAN OUT
 - ROOF DRAIN (SEE ARCH'TL PLANS)
 - TOP OF CURB GRADE
 - PAVEMENT GRADE
 - FLOW LINE-TOP OF CURB GRADE
 - RIDGE LINE
 - 40' PROPOSED CONTOUR
 - 52' EXISTING CONTOUR
 - EXISTING TREE
 - EXISTING POWER POLE (SEE NOTE 13, SHEET C1A)

Sheet Title:
Stormwater and Grading Partial Plan

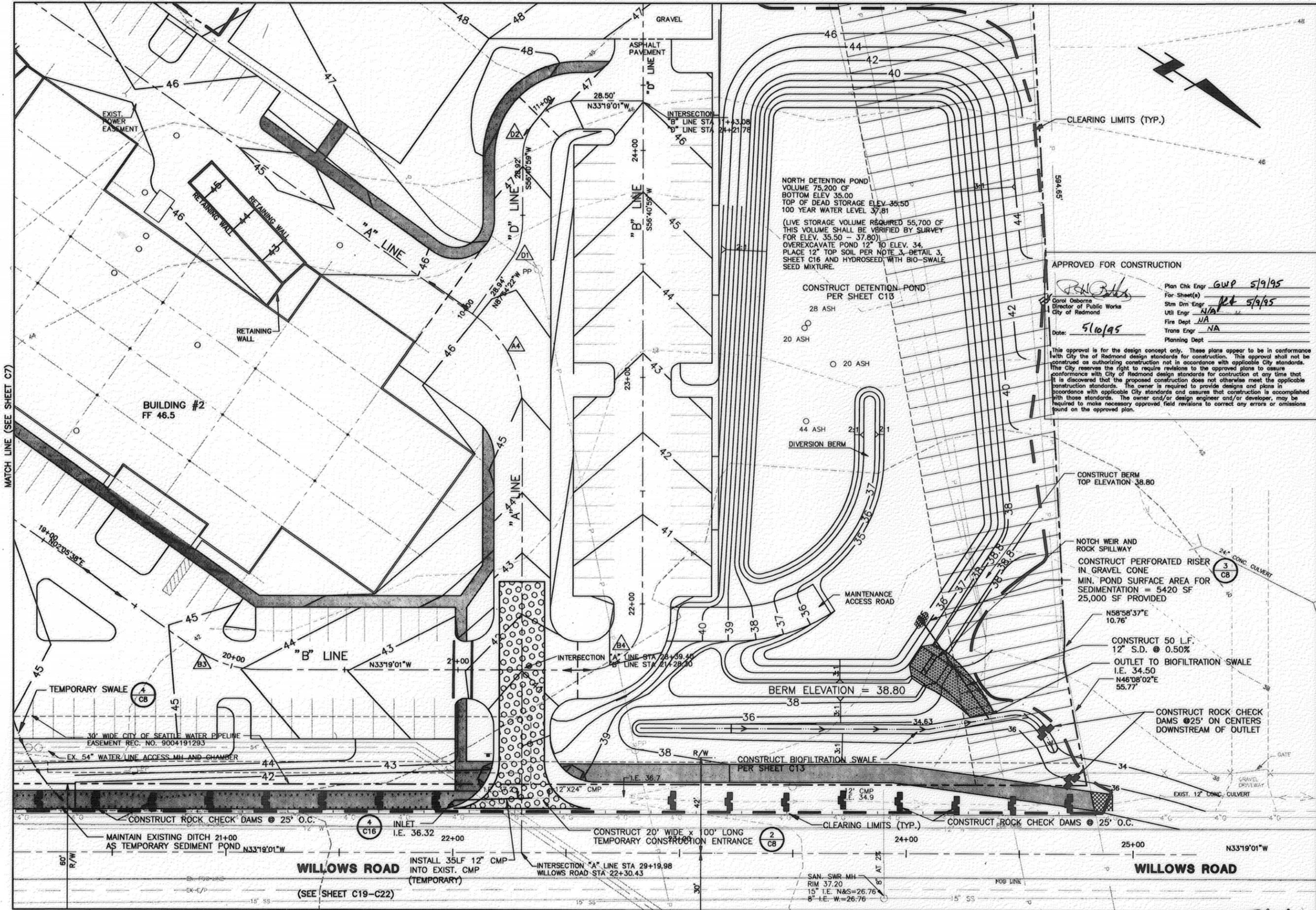
Designed: MJS/MSV
 Drawn: ELS/RAT
 Checked: MUS/MSV
 Scale: 1"=20'
 Date: 02/01/95
 Revisions:

Date: 5-2-97 By: SVA Item: AS-BUILT

Date	By	Item
5-2-97	SVA	AS-BUILT

PROJECT NO: 3-1142-0301
 DRAWING FILE NAME: OPUSTORM

95-0874



NORTH DETENTION POND
VOLUME 75,200 CF
BOTTOM ELEV 35.00
TOP OF DEAD STORAGE ELEV 35.50
100 YEAR WATER LEVEL 37.81

(LIVE STORAGE VOLUME REQUIRED 55,700 CF
THIS VOLUME SHALL BE VERIFIED BY SURVEY
FOR ELEV. 35.50 - 37.80)
OVEREXCAVATE POND 12" TO ELEV. 34.
PLACE 12" TOP SOIL PER NOTE 3, DETAIL 3,
SHEET C16 AND HYDROSEED WITH BIO-SWALE
SEED MIXTURE.

CONSTRUCT DETENTION POND
PER SHEET C13
28 ASH
20 ASH
44 ASH

APPROVED FOR CONSTRUCTION
[Signature]
Carol Osborne
Director of Public Works
City of Redmond
Date: 5/10/95
Plan Chk Engr: GWP 5/9/95
For Sheet(s):
Stm Dm Engr: JPA 5/9/95
Util Engr: N/A
Fire Dept: NA
Trans Engr: NA
Planning Dept:

This approval is for the design concept only. These plans appear to be in conformance with City of Redmond design standards for construction. This approval shall not be construed as authorizing construction not in accordance with applicable City standards. The City reserves the right to require revisions to the approved plans to assure conformance with City of Redmond design standards for construction at any time that it is discovered that the proposed construction does not otherwise meet the applicable construction standards. The owner is required to provide designs and plans in accordance with applicable City standards and assures that construction is accomplished with those standards. The owner and/or design engineer and/or developer, may be required to make necessary approved field revisions to correct any errors or omissions found on the approved plan.

CONSTRUCT BERM
TOP ELEVATION 38.80

NOTCH WEIR AND
ROCK SPILLWAY
CONSTRUCT PERFORATED RISER
IN GRAVEL CONE
MIN. POND SURFACE AREA FOR
SEDIMENTATION = 5420 SF
25,000 SF PROVIDED
N58°58'37"E
10.76'

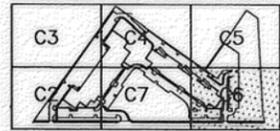
CONSTRUCT 50 L.F.
12" S.D. @ 0.50%
OUTLET TO BIOFILTRATION SWALE
I.E. 34.50
N46°08'02"E
55.77'

CONSTRUCT ROCK CHECK DAMS @ 25' ON CENTERS
DOWNSTREAM OF OUTLET
CONSTRUCT BIOFILTRATION SWALE
PER SHEET C13

CONSTRUCT ROCK CHECK DAMS @ 25' O.C.
CONSTRUCT 20' WIDE x 100' LONG
TEMPORARY CONSTRUCTION ENTRANCE
INSTALL 35LF 12" CMP
INTO EXIST. CMP
(TEMPORARY)

Opus
Northwest
Corporation
**WILLOWS
COMMERCE
PARK**
Redmond, Washington

W&H PACIFIC
3005 - 120th Avenue N.E.
P.O. Box C-97894
Bellevue, WA 98009-9304
PLANNING • ENGINEERING • ARCHITECTURE



Sheet Key
[Signature]
4/18/95

Sheet Title:
**Temporary Erosion
and Sedimentation
Control
Partial Plan**

Designed: MJS
Drawn: ELS/RAT
Checked: MJS
Scale: 1"=20'
Date: 02/01/95
Revisions:

Date	By	Item

PROJECT NO: 3-1142-0301
DRAWING FILE NAME: OPUSTECP

Sheet Number **C6**

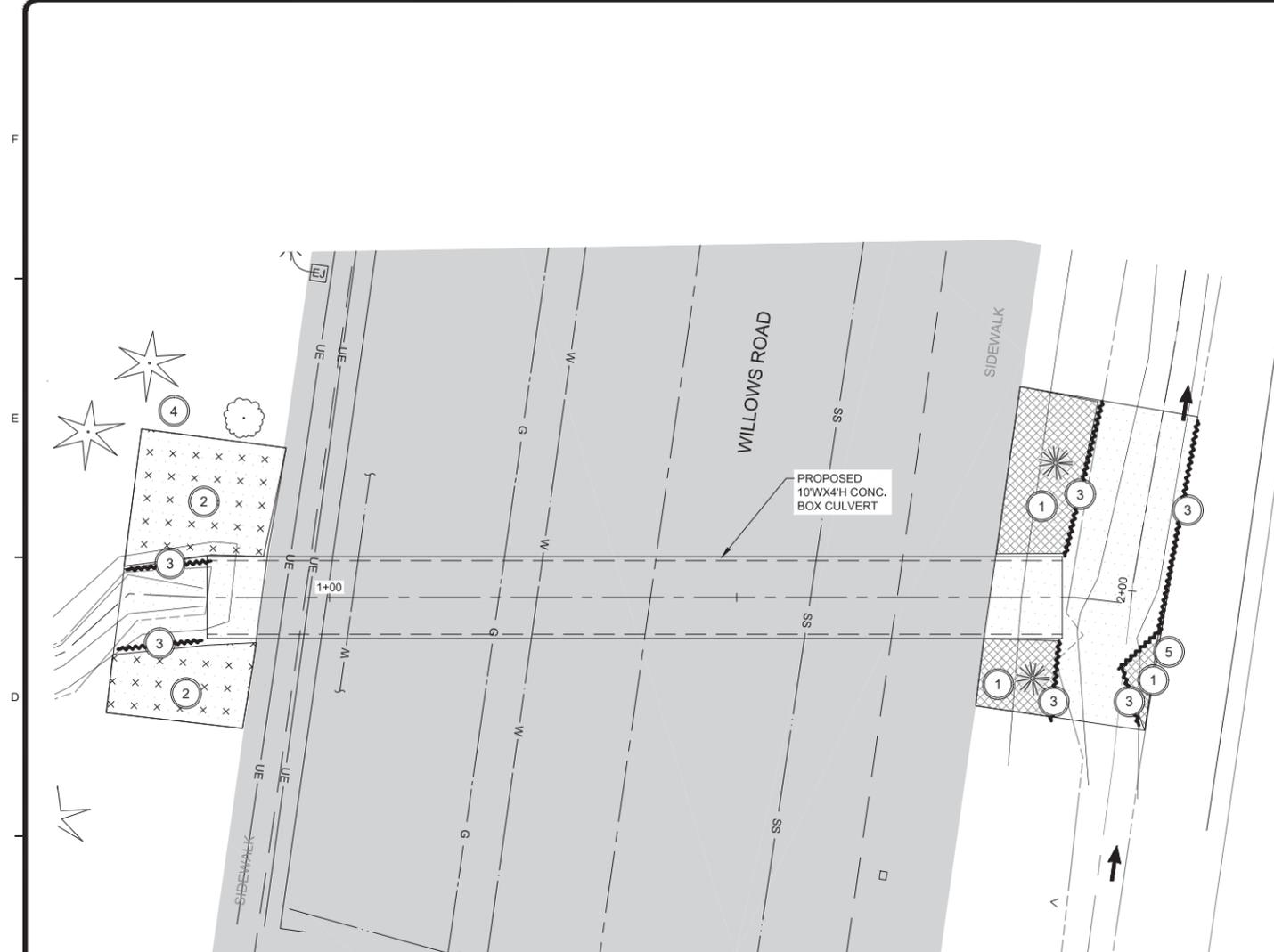
95-0866

Appendix F

Planting Plan



8/22/2018 11:57:48 AM - U:\PSO\PROJECTS\CIENTS\2877-TETRA\TECH\563-2577-018 WILLOW RD RESTORATION\9895\CS\CADD\DWG\T37723 L CULVERT LANDSCAPE RESTORATION.DWG - JASON CERALDE

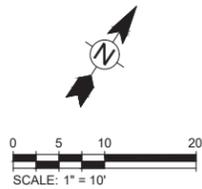


CONSTRUCTION NOTES:

- ① ZONE 1 RIPARIAN RESTORATION, SEE L-3
- ② ZONE 2 RIPARIAN RESTORATION, SEE L-3
- ③ COIR LOG PLANTING, SEE SEE L-3
- ④ ADJUST PLANT LOCATIONS AROUND TREES
- ⑤ NO COIR FABRIC INSTALLATION

GENERAL NOTES

- 1. LOCATE AND PROTECT EXISTING LANDSCAPE IRRIGATION. REPAIR OR REPLACE IF DAMAGED.



PLANTING LEGEND AND MATERIALS LIST:						
	SCIENTIFIC NAME	COMMON NAME	QTY	MIN SIZE / CONDITION	SPACING	NOTES
TREES						
	THUJA PLICATA	WESTERN RED CEDAR	2	4' TALL / #5 CONT	Per Plan	
ZONE 1 PLANTINGS						
	CORNUS SERICEA	RED OSIER DOGWOOD	49	30" x 1/2" / LIVESTAKE	18" OC	
	SALIX HOOKERIANA	HOOKE'S WILLOW	49	30" x 1/2" / LIVESTAKE	18" OC	
	SALIX SITCHENSIS	SITKA WILLOW	49	30" x 1/2" / LIVESTAKE	18" OC	
ZONE 2 PLANTINGS						
	CORNUS SERICEA	RED OSIER DOGWOOD	15	12" / #1 CONT	3' OC	
	PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	8	12" / #1 CONT	3' OC	
	ROSA PISOCARPA	CLUSTERED WILD ROSE	15	12" / #1 CONT	3' OC	
	RUBUS SPECTABILIS	SALMONBERRY	15	12" / #1 CONT	3' OC	
COIR LOG PLANTINGS						
	SALIX SITCHENSIS	SITKA WILLOW	30	30" x 1/2" / LIVESTAKE	1' OC	
	CORNUS SERICEA	RED OSIER DOGWOOD	30	30" x 1/2" / LIVESTAKE	1' OC	
	SALIX HOOKERIANA	HOOKE'S WILLOW	30	30" x 1/2" / LIVESTAKE	1' OC	



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SEATTLE, WASHINGTON 98101
TEL: 206.728.9655



MARK	DATE	DESCRIPTION	BY

CITY OF REDMOND
WILLOWS ROAD REHABILITATION
GUN CLUB CREEK
RESTORATION LANDSCAPING

Project No.: 100-RCE-T37723
Designed By:
Drawn By:
Checked By:



60% SUBMITTAL
NOT FOR CONSTRUCTION

L-2

