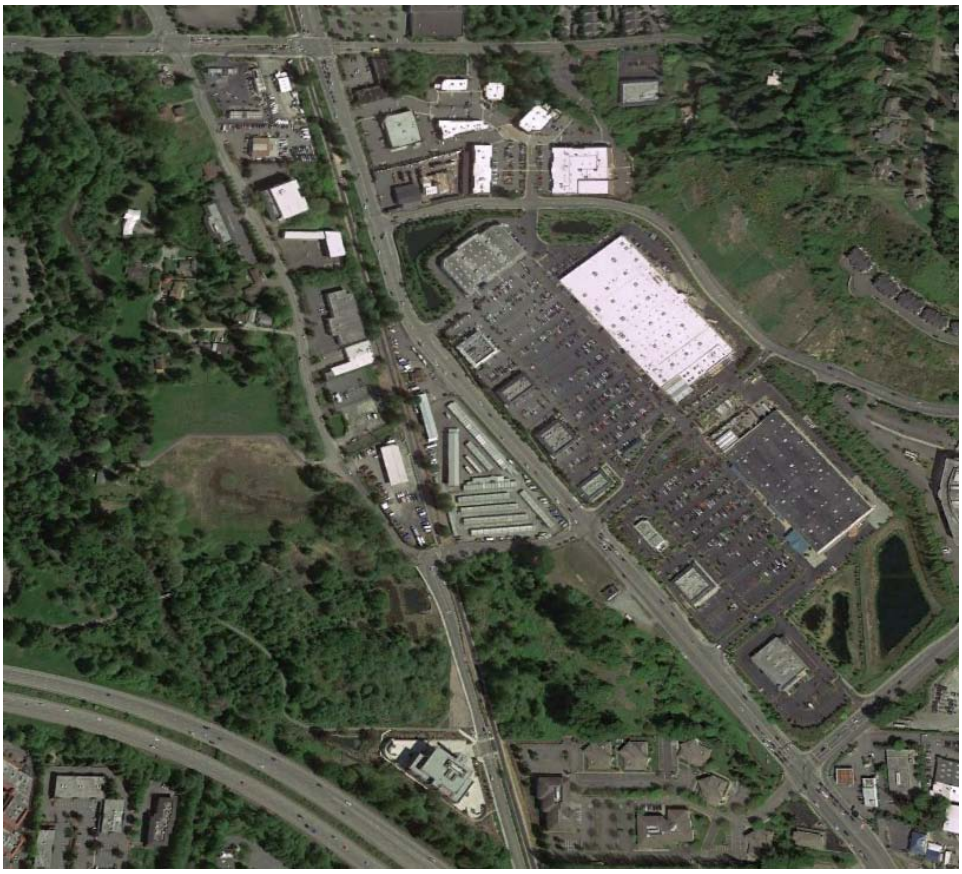
Attachment A
EAST LAKE SAMMAMISH PARKWAY SE IMPROVEMENTS

Critical Areas Report and Conceptual Mitigation Plan

Prepared for

City of Issaquah

April 2014 (rev)



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1.0 PROJECT AUTHORIZATION AND SCOPE OF WORK

The City of Issaquah (City) is proposing improvements to East Lake Sammamish Parkway SE between SE 56th Street and SE Issaquah-Fall City Road. At the request of the City of Issaquah, Environmental Science Associates (ESA) delineated wetland boundaries and streams and prepared this technical report and conceptual mitigation plan for the proposed project.

This report is intended to satisfy U.S. Army Corps of Engineers (Corps) and Washington Department of Ecology (Ecology) wetland delineation report requirements for Clean Water Act (sections 404 and 401) permitting purposes. The report is organized to meet the requirements of the City of Issaquah Municipal Code (IMC)—Chapter 18.10—Critical Areas Regulations. Per IMC 18.10.360, critical areas regulated by the City include: coal mines, streams (fish and wildlife habitat conservation areas[1]), wetlands, steep slopes, protective buffers, watersheds, aquifer recharge areas, as well as areas subject to erosion, flooding, landslides, and seismic hazards. ESA's scope of work for this project is limited to wetlands and fish and wildlife habitat conservation areas; however, other types of critical areas regulated by the City such as flood hazard areas and geologically hazardous areas are briefly discussed.

2.0 PROJECT OVERVIEW AND DESCRIPTION

The project corridor is located in Sections 20 and 21, Township 24 North, Range 6 East, on the Issaquah 7.5-minute series topographic map (Figure 1). The project consists of widening East Lake Sammamish Parkway SE to add a second southbound vehicle lane, a five-foot wide bicycle lane, curb, gutter, and underground utilities from just north of Issaquah-Fall City Road to just south of SE 56th Street. An eight-foot wide landscape planting strip and an eight-foot wide sidewalk will also be added from just south of Black Nugget Road to north of Issaquah-Fall City Road. Additionally, the project includes the widening of the eastbound approach of SE 62nd Street at the intersection of SE 62nd Street and East Lake Sammamish Parkway SE from three to four lanes. Stormwater management facilities will be constructed and/or modified to treat and detain surface runoff. Finally, a sidewalk connection will be installed between East Lake Sammamish Parkway SE and King County Parks' East Lake Sammamish Trail (located approximately 30 feet to the west of the East Lake Sammamish Parkway SE right-of-way) in the vicinity of the intersection of East Lake Sammamish Parkway SE and Black Nugget Road.

The total width of the proposed improvements to East Lake Sammamish Parkway SE will range from 86 to 88 feet. The total length of East Lake Sammamish Parkway SE to be improved is approximately 3,180 feet. It is estimated that the widening of the eastbound approach of SE 62nd St. at the intersection of SE 62nd St. and East Lake Sammamish Parkway SE from three to four lanes will result in a total width of approximately 40 feet versus the current approximately 30-foot width of the existing three lanes. It is assumed that the sidewalk connection between East Lake Sammamish Parkway SE and the East Lake

[1] Streams are described as fish and wildlife habitat conservation areas in this report to reflect the definition in WAC 365-196-830.

Sammamish Trail will not exceed the 12 -foot width of East Lake Sammamish Trail and could possibly be narrower. The location(s) for construction staging has not been finalized.

StormFilter vaults will be installed onsite on the new stormwater conveyance lines that received stormwater runoff from the new driving lane to meet the enhanced basic water quality treatment for metals removal. The project also proposes to provide an off-site flow control facility to mitigate the impacts of increased storm and surface water runoff generated by the new impervious surface. The facility is an existing pond at the intersection of SE Issaquah-Fall City Road and SE Black Nugget Road. To offset the detention requirements for the East Lake Sammamish Roadway project, the volume of the pond will be increased and runoff from a portion of an adjacent residential area will be diverted to the pond using a flow splitter in a manhole in Issaquah-Fall City Road. The adjacent residential area has no existing stormwater detention so is an appropriate trade-off for the increase roadway impervious surface. Also, part of the project corridor is within the area designated for Sensitive Lake Water Quality and Enhanced Basic Treatment, so the pond will be used to provide treatment for both new and replaced pollution-generating impervious surfaces in this discharge area.

The work will take place generally within the current rights-of-way of East Lake Sammamish Parkway SE and SE 62nd Street with the exception of the sidewalk connection planned between East Lake Sammamish Parkway SE and the East Lake Sammamish Trail, the proposed off-site wetland mitigation area on 4th Avenue NW and the stormwater pond at the intersection of SE Issaquah-Fall City Road and SE Black Nugget Road (Figure 1).

3.0 EXISTING CONDITIONS

The study area is located in the Issaquah Creek Basin, within the Cedar River-Lake Washington-Sammamish Water Resources Inventory Area (WRIA) 8. The proposed improvements occur just outside the floodplain the North Fork of Issaquah Creek (Figure 2). The lower Issaquah Creek Basin is characterized by urban development and moderate population density (Kerwin, 2001). Properties within and adjacent to the study area are zoned for intensive commercial, retail, multi-family high density, community facilities—recreation, and single family suburban uses. Land use currently includes residential developments, commercial developments, vacant (vegetated) parcels, and parks and open space.

Parks and open space in vicinity of the study area include: Emily Darst Park (generally located in between Issaquah Creek and the North Fork) and the East Lake Sammamish Trail Corridor (located to the west of East Lake Sammamish Way (Figure 1). Emily Darst Park includes a large wetland mitigation area constructed for multiple projects, including the I-90 Undercrossing Project, SR 900 Overcrossing Project, and Darst Park Trail Improvement Project. The area to the north of Emily Darst Park includes a wetland mitigation site for the Costco Issaquah Warehouse Project.

Critical areas found in the project corridor include: wetlands, fish and wildlife habitat conservation areas, flood hazard areas, aquifer recharge areas, and geologically hazardous areas.

3.1 Wetlands

Historically, Issaquah Creek and its tributaries connected a wetland network that stretched from drainages in the foothills to the south to larger wetland systems at the creek's confluence with Lake Sammamish. The installation of the Ballard Locks in 1914 noticeably changed Lake Sammamish, dropping the water levels in the lake by about 6 feet. This decrease in typical water levels drained extensive areas of wetland on the Issaquah Creek delta (Kerwin, 2001; Carey, 2003). Although much of the lower Issaquah Creek Basin is altered, large portions of the historic wetland system remain. According to City and National Wetland Inventory (NWI) mapping, wetlands are mapped along or directly adjacent to Issaquah Creek and the North Fork of Issaquah Creek in the study area (Figures 2 and 3).

Wetland delineations conducted by Jones and Stokes (2005[2]), Parametrix (2011[3]), and Sewall Consulting (2011[4]) identified several wetlands in and to the north of Emily Darst Park, as well as along the East Lake Sammamish Trail. While these projects have identified wetlands in the project area, ESA conducted its own field delineations (discussed in Section 4) for the project. In general, ESA's delineations are consistent with previous work conducted in the study area.

[2] Used in the I-90 Undercrossing and Darst Park Trail Improvement Projects
[3] East Lake Sammamish Trail Master Plan—Issaquah Segment
[4] Costco Issaquah Warehouse Mitigation Project

3.2 Fish and Wildlife Habitat Conservation Areas

Washington Department of Fish and Wildlife (WDFW) and City mapping identifies the North Fork of Issaquah Creek flowing southeast to northwest along the west side of the project area. The North Fork of Issaquah Creek joins the mainstem of Issaquah Creek south of SE 56th Street, beyond (downstream of) the limits of the project area. The North Fork of Issaquah Creek is mapped as known spawning and juvenile rearing habitat for resident cutthroat, fall Chinook, winter steelhead, coho salmon, and sockeye salmon (WDFW, 2010; Figure 3).

Parametrix identified a tributary to the North Fork of Issaquah Creek approximately 200 feet to the southwest of the intersection of East Lake Sammamish Parkway SE and SE Black Nugget Road. Neither City, County, nor WDFW mapping identifies this tributary. Wetlands in the project corridor drain to this stream, which begins to the west of the East Lake Sammamish Trail and flows in a westerly direction towards the North Fork. The confluence of the tributary and the North Fork is located to the west of 221st Place SE and north of SE 60th Street. No fish are documented in the tributary.

Issaquah Creek, a major tributary to Lake Sammamish, flows over 17 miles from its headwaters on Tiger Mountain north to Lake Sammamish. The middle and upper portions of the Issaquah Creek Basin are identified as a Regionally Significant Resource Area because of exceptional fisheries habitat and undeveloped character (King County, 1994 in Kerwin, 2001). The drop in lake elevation from the construction of the Ballard Locks in 1914 caused small-scale geomorphic changes to Issaquah Creek and its tributaries. In the lower basin, stream channels that flow into the lake were forced to incise to match the new base level. Issaquah Creek is mapped as known spawning habitat for resident cutthroat, fall Chinook, coho salmon, kokanee salmon, winter steelhead, and sockeye salmon (WDFW, 2010; Figure 3).

Several other creeks which drain to Lake Sammamish are located in the project vicinity. Parkhill Creek and a tributary to Lake Sammamish are located to the north of SE 56th St. According to WDFW maps, Parkhill Creek and the tributary to Lake Sammamish do not support fish; however, previous studies in the area classify these as fish bearing streams (Parametrix, 2011). Tibetts Creek, a salmon-bearing stream, and its tributaries are located approximately ¼ mile to the west of the study area.

3.3 Other Wildlife Habitats

WDFW Priority Habitats and Species (PHS) program has mapped several priority habitats polygons to the west of the project corridor (WDFW, 2010; Figure 3). Issaquah Creek wetlands are mapped as a priority habitat along the mainstem of Issaquah Creek and the confluence of the North Fork of Issaquah Creek with the mainstem. A bald eagle's nest is mapped on the west bank of Issaquah Creek, approximately 1,000 feet west of East Lake Sammamish Parkway SE.

3.4 Flood Hazard Areas

Flood hazard areas include floodplains and other areas subject to flooding as identified by the Federal Emergency Management Agency (FEMA) in the King County, Washington Flood Insurance Study and

accompanying Flood Insurance Rate Maps (IMC 18.36.040; FEMA, 2005). The 100-year floodplain of North Fork of Issaquah Creek lies just west of the proposed road improvements (Figure 2). No fill will be placed within the floodplain, but a portion of the floodplain (along 4th Avenue NW, south of SE 62nd Street) will be excavated as part of the proposed wetland mitigation (see section 6.2).

3.5 Critical Aquifer Recharge Areas

Critical Aquifer Recharge Areas (CARAs) are areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge (WAC 365-190-030; IMC 13.29.011). Areas susceptible to groundwater contamination are shown on Figure 2 (King County, 2009).

CARAs are mapped in a small portion of the project corridor near the intersection of East Lake Sammamish Parkway SE and SE 56th Street. The CARA is categorized as a Class 3, which includes mapped areas outside of wellhead protection areas that are identified as having high aquifer recharge potential.

3.6 Geologically Hazardous Areas

Geologically hazardous areas (Figure 2) include areas that are susceptible to erosion, sliding, earthquake, or other geological events and are not suited to the siting of commercial, residential, or industrial development consistent with public health and safety concerns" (RCW 36.70A.030 (9)).

The project corridor is within a mapped seismic hazard area. Areas to the east of East Lake Sammamish Parkway SE are mapped erosion hazard areas. Landslide and coal mine hazard areas are mapped approximately ½-mile to the southeast of the project corridor.

3.7 Soils

Although soils are not a critical area, they can provide additional information related to critical areas (e.g., identifying hydric soils which may indicate potential wetlands). ESA reviewed Natural Resources Conservation Service (NRCS) soil maps. The following soil types are mapped in the study area and are shown on Figure 4:

- Bh: Bellingham silt loam
- Sh: Sammamish silt loam

A summary of each soil's Official Soil Series Description follows:

<u>Bellingham Silt Loam (Bh)</u>. Bellingham soils are mapped on the western and eastern portions of the study area. Bellingham soils are classified as fine, mixed, superactive, nonacid, mesic Vertic Endoaquepts, formed in loess, alluvium, and lacustrine sediments. Bellingham soils are typically located in depressions, with slopes of 0 to three percent. These soils are very deep and poorly drained. Surface

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layers are typically black to dark gray silty clay loam approximately five inches thick. The subsoil below is typically dark gray to light gray or white silty clay-clay to a depth of 60 inches. Bellingham silt loam is mapped as a partially hydric soil series, meaning that at least one component is rated as hydric and at least one component is rated as not hydric (i.e., the series may have hydric inclusions) (NRCS, 2012).

Sammamish Silt Loam (Sh). Sammamish soils are mapped primarily in the eastern portion of the study area. Sammamish soils are classified as fine-loamy, mixed, superactive, nonacid, mesic Fluvaquentic Humaquepts, formed in alluvium or glacial outwash. These soils are typically found in stream valleys and local glacial lake depressions in the Puget Sound Basin. Sammamish soils are somewhat poorly drained. Surface layers are typically very dark grayish brown silt loam approximately 12 inches thick. The subsoil below is typically a stratified grayish brown to gray silt loam to loamy sand to a depth of approximately 48 inches. Sammamish silt loam is mapped as a partially hydric soil series, meaning that at least one component is rated as hydric and at least one component is rated as not hydric (i.e., the series may have hydric inclusions) (NRCS, 2012).

4.0 RESULTS OF FIELD INVESTIGATION

The following sections describe the results of the field investigation conducted by ESA biologists Brock Rylander, Kolten Kosters, and Sara Noland on March 14, 19, 20, 23 and April 19, 2012. These sections describe critical areas identified and delineated on the site, including: wetlands and fish and wildlife habitat conservation areas. Methods used to identify these critical areas are included in Appendix A. Common plant names are used throughout this report; scientific names are provided in Appendix B. Wetland Rating Forms are provided in Appendix C, and wetland delineation data forms are provided in Appendix D.

4.1 Wetlands Determinations

ESA identified four wetlands in the immediate vicinity of the proposed roadway improvements (Wetlands B, C, D, and V; Figure 5). Wetlands B, C, and D are small depressions located within the rights-of-way of East Lake Sammamish Parkway SE and/or the East Lake Sammamish Trail. The area between the road and the trail is about 50 to 60 feet wide and contains utilities (water, sewer, etc.). Invasive species such as reed canarygrass and Himalayan blackberry dominate the wetlands, but there are also scattered patches of native trees and shrubs. Wetlands are summarized in Table 1 and described in the following sections. The wetland boundaries flagged by ESA were surveyed by Gray and Osborne during March and April 2012.

Table 1. Summary of Wetlands Identified in the East Lake Sammamish Parkway SE Study Area

Wetland ID	Total Wetland Area[a] (square feet)	Hydrogeomorphic Class / USFWS Class	Scores based on Ecology Rating System[b]	Category
B	4,053	Depressional / Palustrine Emergent	Water quality: 8 Hydrology: 12 Habitat: 7 Total score: 27	IV
C	355	Depressional / Palustrine Emergent	Water quality: 8 Hydrology: 6 Habitat: 4 Total score: 18	IV
D	18,281	Depressional / Palustrine Emergent & Forested	Water quality: 8 Hydrology: 12 Habitat: 9 Total score: 29	IV
V	12,650 [a]	Riverine / Palustrine Emergent & Scrub-shrub	Water quality: 16 Hydrology: 12 Habitat: 17 Total score: 45	III

[a] Includes only wetland area within the right-of-way.
[b] Based on the Washington Department of Ecology's Wetland Rating System for Western Washington

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Wetlands B and C

Wetlands B and C are linear depressional, palustrine emergent wetlands located west of East Lake Sammamish Parkway and east of the East Lake Sammamish Trail (Figure 5; Photos 1 and 2). Wetland B is a long narrow (ranging from approximately 5 to 18 feet in width) swale-like wetland. Wetland C is a small, shallow depression approximately 7 feet wide by 50 feet long. Vegetation within Wetlands B and C includes an emergent community dominated by reed canarygrass. The hydrology of the wetlands appears to be supported primarily by a high groundwater table, stormwater runoff from culverts, and sheet flow from the adjacent paved trail, parking lots, and roadways. Hydrology indicators observed in the wetlands included soil saturation to the surface, a high groundwater table, drainage patterns, and standing water. Soils within the wetlands met hydric soil indicators F6 (Redox Dark Surface), A11 (Depleted Below Dark Surface), and F3 (Depleted Matrix). Data plots DP-3, DP-4, DP-5, DP-6, DP-11, and DP-12 characterize the wetlands and adjacent uplands.

Both these wetlands scored below 30 total points for function, meriting a Category IV rating. The results of the functions assessment are presented in Appendix C. Wetland C is not required to have a buffer because it is a Category IV wetland under 2,500 square feet. The Wetland B buffer consists primarily of mowed lawn grasses, patches of blackberry, and ornamental fruit trees adjacent to the trail and roadway. The overall functions, values, and protection provided by the buffer is low due to the prevalence of invasive species, lack of species diversity, and the proximity to nearby roadways and developments.

Wetland D

Wetland D is a linear depressional, palustrine emergent and forested wetland located west of East Lake Sammamish Parkway and east of the East Lake Sammamish Trail (Figure 5; Photo 3). Vegetation within Wetland D includes an emergent community dominated by reed canarygrass and cattails and a forested community dominated by black cottonwood and Pacific willow. The hydrology of the wetland appears to be supported primarily by a high groundwater table, stormwater runoff from a culvert at the northeast corner of the wetland, and sheet flow from the adjacent trail, roadway, and paved parking lots. Water flows in the wetland to the south towards NE 62nd St. Hydrology indicators observed in the wetland included soil saturation to the surface, a high groundwater table, and standing/flowing water in the wetland interior. Soils within the wetland met hydric soil indicators A4 (Hydrogen Sulfide), A11 (Depleted Below Dark Surface), and F3 (Depleted Matrix). Data plots DP-7 and DP-8 characterize the wetland and adjacent uplands.

Wetland D scored 29 total points for function, meriting a Category IV rating. The results of the functions assessment are presented in Appendix C. The buffer of Wetland D consists primarily of mowed grasses and patches of blackberry and ornamental fruit trees adjacent to the trail and roadway. The overall functions, values, and protection provided by buffers are low due to the prevalence of invasive species, lack of species diversity, and the proximity to nearby roadways and developments.

Wetland V

Wetland V is a riverine, palustrine emergent and scrub-shrub wetland located south of SE 62nd Street (Figure 5; Photo 4). Vegetation within Wetland V includes an emergent community dominated by reed canarygrass and a scrub-shrub community dominated by red-osier dogwood and Sitka willow. The wetland is located in the floodplain of the North Fork of Issaquah Creek, and is primarily supported by overbank flooding from the creek. Water flows through the wetland to the north along the North Fork of Issaquah Creek. Hydrology indicators observed in the wetland included soil saturation to the surface, a high groundwater table, and standing/flowing water in the wetland interior. Soils within the wetland met hydric soil indicator F6 (Redox Dark Surface). Data plot DP-54 characterizes the wetland.

Wetland V scored 45 total points for function, meriting a Category III rating. The results of the functions assessment are presented in Appendix C. The buffer of Wetland V consists primarily of slopes lined with Himalayan blackberry adjacent and scattered black cottonwood and red alder trees. The overall functions, values, and protection provided by buffers are low due to the prevalence of invasive species, lack of species diversity, and the proximity to nearby roadways and developments.

4.1.1 Wetland Ratings and Buffer Requirements

The City requires wetlands to be classified using the Washington State Department of Ecology's Wetland Rating System for Western Washington (IMC 18.10.620) (Hruby, 2004). According to IMC 18.10.640.C, the buffer width assigned to a wetland depends on the wetland rating, characteristics, and scores for habitat and water quality functions. The rating scores and buffer requirements for wetlands in the study area are summarized in Table 2.

Table 2. Wetland Categories and Buffer Width Summary

Wetland ID	Area (square feet)[a]	Category based on Ecology System[b]	Rating Scores based on Ecology System	Buffer Width (feet) based on IMC 18.10.640.C
B	4,053	IV	Water quality: 8 Hydrology: 12 Habitat: 7 Total score: 27	40
C	355	IV	Water quality: 8 Hydrology: 6 Habitat: 4 Total score: 18	0 (Category IV wetlands under 2,500 SF are not required to have a buffer)
D	18,281	IV	Water quality: 8 Hydrology: 12 Habitat: 9 Total score: 29	40

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Wetland ID	Area (square feet)[a]	Category based on Ecology System[b]	Rating Scores based on Ecology System	Buffer Width (feet) based on IMC 18.10.640.C
V	12,650 [a]	III	Water quality: 16 Hydrology: 12 Habitat: 17 Total score: 45	50

[a] Includes only wetland area within the right-of-way.
[b] Based on the Washington Department of Ecology's Wetland Rating System for Western Washington

4.2 Fish and Wildlife Habitat Conservation Areas and Other Drainage Features

The North Fork of Issaquah Creek and one drainage feature are located in the project corridor.

4.2.1 Streams

The North Fork of Issaquah Creek is a Type F stream that flows southeast to northwest across the south edge of the project area. To the south of SE 62nd Street and west of East Lake Sammamish Parkway SE, the North Fork is incised (approximately 10 feet) and confined. Stream width varies from five to 10 feet. Riparian vegetation consists predominantly of red alder, black cottonwood, and Himalayan blackberry. The stream channel through the project vicinity is low-gradient (approximately 0.25 percent slope), has limited woody debris, and is dominated by long glides or runs with few pools and virtually no riffles (The Watershed Company, 2006). The creek has low summer time flows due to infiltration which has been observed in stream reaches within the project vicinity (The Watershed Company, 2006).

The North Fork is documented as known spawning and juvenile rearing habitat for resident cutthroat, fall Chinook, winter Steelhead, coho salmon, and Sockeye salmon (WDFW, 2010). The lower portion of the North Fork has been identified as a Tier 1 restoration area in the WRIA 8 Chinook Salmon Conservation Plan (Chinook Plan), and has also been identified as among the highest ranking restoration opportunities within the City (The Watershed Company, 2006).

4.2.2 Stream Rating and Buffer Requirements

According to IMC 18.10.785.C, the buffer width assigned to a stream depends on the stream rating, and salmonid presence. The North Fork is a Class 2 stream with salmonids (type F stream in the WDNR stream typing) and requires a 100 foot wide buffer according to City code.

4.2.3 Drainage Features

Ditch P, located on the west side of East Lake Sammamish Parkway, appears to have been "artificially created" or at least highly modified such that it would not be considered a regulated wetland or stream under local, state and/or federal regulations. Ditch P abuts the roadway and an adjacent paved parking lot. The ditch is characterized by contoured slopes; routes surface water (from adjacent developments) to the stormwater system via drainage pipes; and is intermittently maintained (mowed and/or cleaned

out). The high degree of modification suggests that this ditch was artificially created and intentionally constructed during development.

ESA evaluated Ditch P according to the definitions for a "wetland[5]" and "stream[6]" listed in (IMC)—Chapter 18.10: Environmental Protection, and according to federal guidance for distinguishing wetlands and streams from other features. The City's wetland definition mirrors the state definition given in RCW 36.70A.030 and the federal definition given in 40 CFR 230.3(t). City regulations exempt certain artificial and intentionally constructed features from the definition of a wetland or a stream. Based on the City's definitions, we interpret the term "artificial" to include ditches and swales that were purposefully constructed, but were not previously a part of a stream or wetland network. The term "intentional" implies that the ditch or swale was planned and modified in such a way to route or retain surface and/or stormwater. City regulations do not provide guidance for assessing ditches and swales as part of a larger drainage network that may include associated wetlands and streams; therefore, we evaluated federal regulations for guidance on these issues.

The Corps and EPA regulate wetlands that are waters of the U.S. under Sections 404 and 401 of the Clean Water Act. The U.S. Supreme Court has addressed the definition of waters of the U.S. which are protected by the CWA in the SWANCC, Rapanos, and Carabell court cases. The Corps and EPA provide guidance on interpreting these rulings in the publication titled *Draft Guidance on Identifying Waters Protected by the Clean Water Act* (EPA, April 2011)[7]. Even though federal regulations exempt ditches and swales from the definition of a wetland when they are excavated from uplands, the Corps may regulate such features as "tributaries"[8] under certain circumstances. Corps jurisdiction is asserted based

[5] Wetlands: 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. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas created to mitigate conversion of wetlands.

[6] Those areas of the City where surface waters from natural sources such as streams, lakes, groundwater, springs or surface flows 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. Streams also include constructed or channelized streams used to convey water which flowed in a naturally defined channel prior to construction of such watercourse. This definition is not meant to include excavated or other entirely artificial watercourses, including irrigation ditches, swales, roadside ditches, canals, storm or surface water runoff devices.

[7] The proposed guidance supersedes the "Joint Memorandum" dated January 15, 2003 and "Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in *Rapanos v. United States & Carabell v. United States*," dated December 2, 2008.

[8] Natural, man-altered, or man-made water bodies that carry flow directly or indirectly (i.e., via other tributaries) into a traditional navigable water. (EPA, 2011)

on the physical, hydrologic, and ecological characteristics (including presence of a Significant Nexus[9]) exhibited.

Based on additional evaluation, ditch P does not meet the City's definition of a wetland or stream (IMC 18.10.390). Furthermore, this feature does not appear to meet the federal definition of a tributary nor provide a significant nexus to other waters of the U.S. In general, ditch P resembles a constructed stormwater ditch and has been manipulated to route surface flows and runoff from adjacent roadways and developments. Historic aerial photos or topographic/elevation review suggest that this feature was intentionally created in previously developed uplands.

4.2.4 Off-site Streams

A tributary to the North Fork of Issaquah Creek is located to the northeast of the intersection of SE 60th Street and 221st Place SE, and to the east of 221st Place SE. The tributary begins from drainage out of a culvert on the west side of Wetland D, flows under the East Lake Sammamish Trail, and flows west, passing through a 6-foot wide culvert under 221st Place SE before discharging into the North Fork. Commercial developments and associated parking lots are located to the north and south of the tributary, which is located in a confined, armored channel. No salmonids are documented within Tributary 1; as such, the tributary is classified as a Type Np stream. Use by resident fish is also unlikely based on the length of the culvert under 221st Place SE. Riparian vegetation includes red alders and Himalayan blackberry.

4.3 Other Wildlife

The project vicinity contains a variety of habitats including wetlands, riparian systems, and riparian buffers, primarily found in parks and open space (i.e., Emily Darst Park and Pickering Trail) to the west of the project corridor. Habitat within the project corridor is fragmented due to the proximity of residential and commercial developments and roadways.

No PHS species were observed within the project corridor (see Section 4.1.3 for a discussion of documented fish use in the study area); however, a nesting bald eagle was observed in the project vicinity, approximately 1,000 feet to the west and south of the study area. Other wildlife (non-PHS species) observed in the project area vicinity during the site visits included: American crow, black-capped chickadee, song sparrow, Stellar's jay, American robin, and black-tailed deer. Other species of birds, mammals, reptiles, and amphibians in addition to those observed are expected to use habitat on the project site. For example, nocturnal species may be present that were not active during the site visit, or other species may only be highly visible or present in this area during certain seasons.

[9] Wetlands or waters that either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of navigable waters. (EPA, 2011)

5.0 PROJECT IMPACTS AND REGULATORY REQUIREMENTS

The proposed project would result in unavoidable impacts to regulated critical areas. These resources are protected at the federal, state, and local levels. Required permits and approvals for each type of critical area are discussed below. In addition, compliance with the National Historic Preservation Act is required, including consultation with affected Native American tribes and potentially a cultural resources survey. A cultural resources survey has been prepared for this project (ESA, 2014).

5.1 Wetlands, Fish and Wildlife Habitat Conservation Areas, and Buffers

The project design includes measures to avoid and minimize impacts to wetlands, streams and their buffers. Retaining walls will be constructed along portions of the roadway (adjacent to Wetlands D and V) to reduce the project footprint and minimize the extent of grading and filling in waters of the U.S. Despite these mitigation measures the project will fill portions of Wetlands B, C and D (Table 4). The area of impact is quite small (3,895 square feet); there will be no direct impacts to the North Fork of Issaquah Creek and no fill within Wetland V, although a small portion of the Wetland V buffer will be cleared.

Wetlands and streams are regulated by Corps, Ecology, WDFW, and the City. At a federal level, the Corps regulates wetlands and streams (i.e., waters of the U.S.) under the Clean Water Act, and projects that affect these features require a Section 404 permit (also known as a Department of the Army permit). The proposed project will meet the regional conditions of Nationwide Permit 14 (Linear Transportation Projects)[10].

The 404 permit will also trigger consultation with the National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act. The federal Services evaluate the proposed activities and their direct and indirect effects on species and habitats that are listed or candidates for listing under the Endangered Species Act.

Wetlands and streams are regulated under Section 401 of the Clean water Act, which is administered by Ecology. Ecology must issue a Water Quality Certification (WQC) for the project and ensure that the project is consistent with the Federal Coastal Zone Management Act. The WQC and CZMA consistency determination are triggered by the Section 404 permit.

No in-water work (work below the Ordinary High Water Mark) will occur in streams; therefore, no HPA will be required for the project. At a local level, wetland, stream, and buffer impacts are regulated by

[10] To meet the conditions of NWP 14, discharges cannot cause greater than ½-acre loss of waters of the U.S. (non-tidal). Regional conditions do not allow footprints wider than 22 feet or longer than 200 feet in waters of the U.S. For the width requirement, “footprint” refers to the footprint of the width of the roadway fill prism.

the City. The proposed project will require review and approval according to IMC Chapter 18.10—Environmental Protection.

5.1.1 Wetland Impacts

Direct wetland impacts include permanent loss of wetland area and function from fill resulting from road construction, retaining walls, and trail access paths (Figures 6 through 8). A summary of permanent wetland impacts is included in Table 3.

Table 3. Wetland Impact Summary

Wetland ID	Total Wetland Area (Square Feet)	Approximate Area of Wetland Fill (Square Feet)	Notes
B	4,053	2,760	Fill due to additional SB roadway lane
C	355	355	Complete wetland fill due to additional SB roadway lane
D	18,281	780	Fill in narrow portion of wetland due to trail access and additional SB roadway lane
V	12,650 [a]	0	No direct impacts; retaining wall will be constructed to minimize encroachment of the sidewalk on the buffer, but there will be some buffer clearing
Total		**3,895**	

[a] Includes only wetland area within the right-of-way.

5.1.2 Stream Impacts

No direct stream impacts (work below the OHWM) will occur as a result of the project.

5.1.3 Buffer Impacts

Wetlands B, C, and D abut the road shoulder of East Lake Sammamish Parkway and have almost no buffer along their eastern edges. The road shoulder is highly disturbed and routinely mowed, offering little to no protection to existing wetlands. Approximately 6,800 square feet of buffer impact will occur along the edges of these wetlands and at the proposed cross-walk connection to the East Lake Sammamish Trail near Wetland D. Approximately 1,900 square feet of buffer impact will also occur in the Wetland V buffer, where tree removal will be necessary to construct the road improvements to SE 62nd Street. Buffer impacts total 8,700 square feet.

6.0 PROPOSED MITIGATION CONCEPT

The proposed project will impact jurisdictional wetlands; therefore, mitigation is required. No net loss and an overall net gain in wetland area and/or functions are central goals of the mitigation plan (IMC 18.10.720.A and 18.10.795.B.2). This section describes the avoidance, minimization and compensatory mitigation actions associated with the proposed project.

6.1 Mitigation Sequencing

When designing the proposed improvements, the project team followed City, State, and federal requirements to avoid and minimize critical area impacts in accordance with the following preferred sequence for mitigation (IMC 18.10.670):

a) Avoiding impacts by not taking a certain action or parts of actions;

b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce the impact by repairing, rehabilitating, or restoring the affected environment;

c) Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.

The project team followed mitigation sequencing during the design of the project and has avoided and minimized impacts to critical areas by designing the proposed improvements along existing roadways, using retaining walls to avoid fill in Wetlands D and V, and locating stormwater detention and treatment facilities outside of critical areas to the greatest extent possible.

6.1.1 Construction Best Management Practices

Project impacts will be avoided and minimized during construction by directing staging areas and construction access points away from wetlands, streams, and their buffers to the greatest extent possible and by using construction best management practices (BMPs). BMPs include erosion and water quality control measures to prevent negative impacts to wetlands and downstream areas. Construction access points will use existing paved surfaces to the greatest extent possible. Standard construction access pads consisting of rock or wood chip mulch will minimize the tracking of mud and debris onto roadways and paved surfaces.

Water quality BMPs may include silt fencing, straw bales, plastic covering, and grass seeding. Final exposed cut and fill slopes will be grass seeded or planted. A spill prevention and control plan will also be prepared to prevent any petroleum, chemical, or other deleterious substances from entering aquatic habitats in case of an accident during construction.

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6.2 Compensatory Mitigation Strategy

The City's compensatory mitigation requirements for impacts to wetlands are established in IMC 18.10.720. Under the City code, any compensatory mitigation project must have no net loss of wetland function and acreage and strive for a net resource gain in wetland function and acreage over present conditions. The City prefers on-site and in-kind mitigation as compensation for wetland impacts; however, IMC allows off-site and out-of-kind mitigation when the proposal will best meet identified regional goals such as: flood storage, flood conveyance, habitat, or other wetland functions (IMC 18.10.730.C and D). The IMC requires off-site mitigation to occur within the same watershed as the wetland impact (IMC 18.10.730.D.2).

The *Compensatory Mitigation for Losses of Aquatic Resources Federal Rule* (*Federal Rule*) provides guidance for compensatory mitigation under the Clean Water Act (Corps, 2008). Preferred mitigation strategies include watershed-based mitigation, namely mitigation banking or in-lieu fee (ILF) programs, which focus on improving watershed structure, processes, functions, and values rather than a strictly on-site and in-kind mitigation approach.

Currently, no mitigation banks or ILF sites are located within the same watershed where wetland impacts occur. Therefore, the City plans to implement permittee-responsible compensatory mitigation to offset unavoidable impacts to wetlands and their buffers. The proposed mitigation includes both on-site and off-site mitigation measures to address site specific and watershed functions and has been designed to meet the intent of the *Federal Rule*. Because the project will require a Corps nationwide permit, the ratios from *Wetland Mitigation in Washington State—Part 1: Agency Policies and Guidance* have been used to calculate the required mitigation area. For impacts to Category IV wetlands, the guidance recommends a 1.5:1 creation ratio. City regulations for Category IV wetlands also require a 1.5:1 ratio (IMC 18.10.720 B).

Table 4 summarizes wetland mitigation required for the project. Sections 6 and 7 outline the conceptual mitigation plan and design details with respect to wetlands and buffers.

Table 4. Wetland Mitigation Requirements

Wetland ID	Wetland Category	Vegetation Community Affected [a]	Direct Impact Area (square feet)	Required Wetland Creation for Direct Impacts	
				Ratio [b]	Area, square feet
B	IV	PEM/PSS	2,760	1.5:1	5,843
C	IV	PEM	355		
D	IV	PSS/PFO	780		
			3,895		**5,843**

[a] Vegetation community refers to Cowardin vegetation class: (P) Palustrine, (EM) Emergent, (SS) Scrub-shrub, (FO) Forested.
[b] Mitigation ratios for wetland creation/reestablishment from Joint Guidance (Ecology, 2006a) and Issaquah Municipal Code.

6.2.1 Mitigation Site Selection and Opportunities

The City proposes to mitigate the impacts on site (within the project corridor) and at a nearby location (Figure 1 and Figures 9 through 11). The mitigation would involve creating new wetland through fill removal and enhancing wetlands and buffers surrounding the wetland creation areas. King County used this type of mitigation approach on the Issaquah segment of the East Lake Sammamish Trail project (Corps project number NWS-2008-889).

On-site Wetland Creation and Enhancement Opportunities

The East Lake Sammamish Parkway SE right-of-way consists of a long, linear corridor that parallels the East Lake Sammamish Trail. The area between the road and the trail is about 50 to 60 feet wide and contains utilities (water, sewer, etc.). Several low-quality Category IV wetlands and their buffers abut the road right-of-way (Photos 5 through 7). These wetlands are characterized as narrow, linear ditches, which are typically a few feet in elevation below the road and trail elevation. Dominant vegetation includes invasive species such as reed canarygrass and limited patches of trees and shrubs. Wetlands are degraded because of the high invasive species presence and lack of native vegetation diversity and structure Project construction will affect portions of these wetlands.

Because of the narrow, disturbed and constrained conditions in the corridor wetland buffers offer poor protection for these wetlands, as they are already smaller than the 40 foot buffers required in IMC 18.10.640.C for Category IV wetlands. Vegetation in wetland buffers typically consists of mowed grasses with small patches of shrubs. High invasive species presence, mowing, disturbance, litter, and rubble/debris further degrade wetland buffer quality.

The on-site wetland mitigation opportunities include improving water quality functions by creating new wetland adjacent to Wetlands B and D and enhancing portions of these wetlands. Wetlands B and D provide better mitigation opportunities than other wetlands along the corridor because they drain to an unnamed tributary of the North Fork of Issaquah Creek. Because of the connectivity to the unnamed North Fork tributary, wetland creation and enhancement will not only increase ecological functions above existing conditions, but will provide ecological benefit to downstream resources.

Mitigation within Wetlands B and D is also advantageous in that the mitigation would occur relatively close to the impact area and would be in-kind. In addition to improving water quality, native plant installation will provide an opportunity for visual and aural screening of adjacent commercial land uses for both wildlife and trail users. Wetland buffer functions will be slightly improved by installing native plants, but overall opportunity is low due to insufficient space.

4th Avenue NW Mitigation Opportunities

Additional mitigation will be provided on a City-owned parcel to the west of 4th Avenue NW, adjacent to Darst Park (tax # 2124069021). This mitigation area is only 600 feet from the proposed improvements. Darst Park contains a Category II wetland and stream complex between Issaquah Creek and the North Fork of Issaquah Creek. The proposed mitigation area, which consists of a triangular-shaped gravel pad, currently abuts the wetland (Photo 8). Because the existing gravel pad is mostly unvegetated, this

portion of the wetland has no functional buffer. Based on review of historic aerial photographs, the gravel pad was used for staging during the construction of 4th Avenue NW. At its widest point, the parcel is approximately 60 feet wide. Himalayan blackberry lines the edge of the existing wetland and the west edge of the gravel pad (Photo 9).

6.3 Conceptual Mitigation Plan

This section summarizes the proposed mitigation, including wetland creation, wetland enhancement, and buffer enhancement.

Wetland Creation. New wetland will be created adjacent to Wetlands B and D (see Figures 1 and 9). Wetlands B and D provide better mitigation opportunity compared to other wetlands along the corridor because they drain to tributaries of the North Fork of Issaquah Creek and Lake Sammamish. Because of their connectivity to tributaries, wetland creation adjacent to these wetlands will not only increase ecological functions above existing conditions, but will provide ecological benefit to downstream resources. On-site mitigation is the preferred approach according to the City code.

The wetland creation area currently consists of pavement (Wetland B creation area) and a small mound of rubble overgrown with Himalayan blackberry (Wetland D creation area). Pavement and rubble will be removed and these areas will be excavated from roughly an elevation of 58 feet to an elevation of 56 feet to match existing wetland surfaces and intersect shallow groundwater to support wetland hydrology (Figure 11). Created wetlands will provide passive water quality treatment potential. The wetland creation areas will increase native habitat complexity and structure by establishing new emergent and shrub wetland communities that are contiguous with existing areas. Native shrub and emergent species including Pacific willow, swamp rose, and slough sedge will be planted to help filter sediments and nutrients and provide flood attenuation. Where necessary, topsoil and soil amendments will be added to improve soil quality.

The City will create 5,843 square feet of new wetland to offset the impacts as shown in Table 4. This is the minimum area required to achieve the 1.5:1 replacement ratio. The created wetlands would be Category IV wetlands, which is equivalent to the category of the impacted wetlands.

Wetland Enhancement and Buffer Creation. Issaquah City code requires that every wetland mitigation area have a wetland buffer equal in width to the buffer that would be required for that wetland type/category (IMC 18.10.640). This means that the created wetlands in the right-of-way would need to have 40-foot-wide buffers for a total buffer area of 35,950 square feet (total for both Wetlands B and D combined). Currently, wetlands in the project corridor have smaller buffers than what is required by City code. Due to insufficient space between the road and trail, it is not possible to provide a 40-foot-wide buffer around the proposed wetland creation sites. The buffer area that can be provided is only a few feet wide. To meet City code and make up for the difference between the available buffer and the required buffer, the project proposes to compensate for the buffer deficit (at a 1:1 ratio) through wetland and buffer enhancement within the project corridor (at Wetlands B and D) and on a City-owned parcel on 4th Avenue NW (see Figures 1 and 10).

Portions of Wetlands B and D within the corridor will be enhanced through invasive species removal and native plant installation (Figure 9). These areas will be cleared, grubbed and planted to enhance their functions. This wetland enhancement will increase native habitat complexity and structure by establishing new emergent and shrub wetland communities consisting of Pacific willow, swamp rose, and slough sedge.

In addition, the narrow buffers of Wetlands B and D would be enhanced to improve their quality and function (Figure 9). Western hazelnut, snowberry, Oregon grape, and coastal strawberry will be planted in the buffers to increase plant diversity, provide an improved wildlife corridor, and improve visual and aural screening along the trail. Where necessary, topsoil and soil amendments will be added to improve soil quality. Fencing will be installed along the edge of the East Lake Sammamish Trail to minimize intrusion and disturbance. The proposed wetland enhancement and buffer mitigation in the corridor would provide 20,870 of the 35,950 square feet needed to meet the City's requirements.

An additional 15,080 square feet of wetland buffer mitigation will be provided at a City-owned parcel (tax # 2124069021) adjacent to the east edge of Darst Park, approximately 600 feet from the proposed road improvements (Figure 1). The parcel is located between 4th Avenue NW and the existing Darst Park wetland / stream complex (Wetland "T"). It consists of a gravel pad that is approximately 60 feet wide at its widest point. Based on review of aerial photographs, this area was used for staging during the construction of 4th Avenue NW. The parcel is part of the buffer for the adjacent Category II wetland, but is unvegetated and does not currently function as a buffer. Himalayan blackberry lines the edge of the existing wetland and the west edge of the gravel pad. The mitigation would remove the gravel and fill, amend the soils and plant the area with native tree and shrub species (Figures 10 and 11). The wetland would benefit from removal of Himalayan blackberry and planting of native species to establish an effective buffer where none currently exists. Establishing a functional buffer on this existing wetland makes up for the remaining 15,080 square feet of mitigation area needed to offset the buffer deficit on the wetland mitigation areas within the right-of-way as shown in Table 5.

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Table 5. Proposed Mitigation Summary

Wetland Mitigation Area	Wetland Category	Buffer Area Required to meet City Code (square feet)	Mitigation Area Provided (square feet)		Total Mitigation Area (square feet)
			Buffer Mitigation	Wetland Enhancement	
B	IV	19,450	14,827	1,293	16,120
D	IV	16,500	4,350	400	4,750
Subtotal		**35,950**	**19,177**	**1,693**	**20,870**
4th Ave NW (Wetland "X")	II	0 (this is an existing wetland, not a mitigation area)	12,480	2,600	15,080
Total		**35,950**	**31,657**	**4,293**	**35,950**

6.3.1 Mitigation Goals, Objectives, and Performance Standards

The overall goal of wetland mitigation is to replace and improve the habitats and functions lost as a result of the project. The proposed mitigation will accomplish this by creating features which address important watershed functions, including:

- Sediment and nutrient retention;
- Organic matter production for export downstream;
- Native plant richness; and
- Wildlife habitat

Specific goals and objectives have been formulated to achieve the functions described above.

Mitigation Goals

Mitigation goals include:

1. Creating 5,843 square feet of emergent, shrub, and forested wetland;
2. Enhancing 20,870 square feet of existing wetland with emergent, shrub, and forested habitat; and
3. Enhancing 15,080 square feet of wetland buffer with shrub and forested habitat.

Achievement of these goals is expected to provide the following improvements to wetlands, buffers, and downstream aquatic resource functions:

- Increase retention of sediments and nutrients by creating wetland contiguous with Wetlands B and D;
- Increase organic matter production and export by planting trees and shrub in the created wetland, enhanced wetland, and buffers; and
- Improving native plant richness, wildlife habitat, and connectivity within the North Fork of Issaquah Creek corridor.

Objectives and Performance Standards

The following objectives and performance standards are proposed to measure the mitigation project's performance in achieving desired goals and functions.

Hydrology

Objective 1: Establish adequate hydrology to maintain wetland characteristics for the wetland creation and wetland reestablishment areas.

> **Performance Standard 1a:** Soils in the created and reestablished wetland areas will remain inundated or saturated within 12-inches of the soil surface for a minimum of 30 consecutive days during the growing season for each monitoring year in which rainfall and stream flows are at or above normal levels.

Plant Communities - Wetland

Objective 2: Install native emergent, shrub, and tree species in wetland mitigation areas.

> **Performance Standard 2a:** Year 1—100 percent survival of installed emergent and woody species within one year of mitigation installation.
>
> **Performance Standard 2b:** Year 2—native shrub density of 1120 plants per acre (installed and volunteer).
>
> **Performance Standard 2c:** Year 3— native shrub density of 1080 plants per acre (installed and volunteer).
>
> **Performance Standard 2d: Year 4**—No standard. Conduct informal monitoring to observe whether site management activities are needed (weed management, mulching, etc.).
>
> **Performance Standard 2e:** Year 5—30 percent areal cover of native species (installed and volunteer).

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Plant Communities - Buffer

Objective 3: Install native emergent, shrub, and tree species in wetland and buffer mitigation areas.

> **Performance Standard 3a:** Year 1—100 percent survival of installed emergent and woody species within one year of mitigation installation.
>
> **Performance Standard 3b:** Year 2—native woody plant density of 680 plants per acre (installed and volunteer).
>
> **Performance Standard 3c:** Year 3— native woody plant density of of 650 plants per acre (installed and volunteer).
>
> **Performance Standard 3d:** Year 4—No quantitative standard. Conduct informal monitoring to observe whether site management activities are needed (weed management, mulching, etc.).
>
> **Performance Standard 3e:** Year 5—20 percent areal cover of native species (installed and volunteer).

Objective 4: Remove and limit non-native, invasive vegetation in wetland and buffer mitigation areas.

> **Performance Standard 4a:** Cutleaf blackberry, Himalayan blackberry, English ivy, and other noxious weeds (excluding reed canarygrass) will not exceed 20 percent areal cover in all planting areas throughout the 5 year monitoring period. Reed canarygrass will not exceed 30 percent areal in all planting areas throughout the 5 year monitoring period.

Wildlife Habitat

Objective 5: Provide wetland and upland habitat.

> **Performance Standard 5a:** Increase in native woody species density and/or cover in the planted wetland and buffer mitigation areas, as measured in Objectives 2 and 3, to be used as a surrogate to indicate increasing habitat functions.

Anthropogenic Disturbance

Objective 6: Protect mitigation sites from anthropogenic disturbances.

Performance Standard 6a: Conduct qualitative monitoring to assess mitigation site status yearly during the monitoring period. Qualitative observations may include, but are not limited to fill in wetlands or buffer, trash or debris, and vandalism.

Performance Standard 6b: Install and maintain fences and appropriate signage along buffer perimeters.

6.4 Monitoring Plan

The main objective for mitigation monitoring is to document the level of success in meeting the project's performance standards. Monitoring will occur during and after construction. Construction monitoring will ensure that clearing limits are maintained as described in the construction documents and plans, and that Best Management Practices (e.g., sediment control devices such as silt fences and straw bales) are in working order. Mitigation monitoring will also be conducted yearly. The following describes the monitoring approach.

6.4.1 Schedule

An initial stem count of the installed shrubs and trees will be conducted following construction (an as-built count). Monitoring of mitigation areas will continue annually for five years post-construction, as required by IMC 18.10.500. A qualified biologist or landscape designer will conduct the monitoring. The as-built plan will be used as the basis for monitoring of plant survival. Monitoring will begin the first full growing season after construction is complete and the plants have been installed.

6.4.2 Data Collection

Monitoring includes site visits to collect data and evaluate the mitigation sites. Native vegetation areal cover will be evaluated quantitatively and qualitatively one year after construction and each year thereafter for five years. The following information will also be recorded during each of the monitoring site visits:

- Survival rates of installed vegetation during plant warranty period;
- General plant health assessment and plant aerial coverage from established sampling points;
- Sediment deposition in existing, created, and reestablished wetlands connected to streams (visual assessment);
- Groundwater monitoring at established wells or by digging shallow pits in wetland creation and reestablishment areas to ensure that wetland hydrology criteria are met (multiple sampling events in the early growing season are proposed—this would likely occur outside of the annual monitoring event);
- Documentation of the presence of undesirable plants (weedy and/or non-native species) with estimated percent cover;
- Photo documentation of site conditions from established photo points;
- Impacts to the wetland buffer from human use (e.g., dumping of debris); and
- Signs of wildlife use of the area.

Results of the annual monitoring events will be discussed in a yearly monitoring report prepared for the City and regulating agencies.

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6.4.3 Reporting

Monitoring reports will be prepared by a qualified biologist or landscape designer for review and approval by regulating agencies. The reports will compare the performance standards described in the mitigation plan to the field observations, and will recommend species replacements or other maintenance activities, if necessary (see Maintenance section below). Reports will present data collected during the monitoring site visit, and document successes in meeting specific performance standards. Photographs will be included to illustrate and document site conditions. Monitoring reports will be submitted by the end of each monitoring year.

6.5 Maintenance

Maintenance of the mitigation area will begin after completion of the project and continue, as needed, for five years. After the initial planting acceptance by the project biologist, the landscaping contractor will be responsible for plant survival for a period of one year. The City will provide on-going, long-term maintenance, as necessary. Maintenance could include, but may not be limited to:

- Watering or providing irrigation during dry periods (the need for irrigation will be evaluated during the plant establishment period);
- Removing non-native or invasive plant species as needed;
- Providing soil amendments and/or mulch as needed;
- Providing fencing around woody plants to prevent animal damage as necessary;
- Providing fencing to prevent vandalism or damage caused by humans; and
- Installing supplemental plantings as needed.

6.6 Contingency

Information from the annual monitoring program will be used to identify any maintenance and/or corrective actions. If any portion of the mitigation is not successful, the City's qualified biologist will assess the site to determine what conditions are preventing the site from meeting its performance standards. A contingency plan would be developed in cooperation with the City and regulating agencies. Such plans are prepared on a case-by-case basis. Contingency measures may include but are not limited to: installing additional plants, installing plant protection, increasing maintenance to control invasive species, and other countermeasures. These activities would be discussed in the annual monitoring report.

7.0 LIMITATIONS

Within the limitations of schedule, budget, scope-of-work, and seasonal constraints, we warrant that this study was conducted in accordance with generally accepted environmental science practices, including the technical guidelines and criteria in effect at the time this study was performed, as outlined in the Methods section. The results and conclusions of this report represent the authors' best professional judgment, based upon information provided by the project proponent in addition to that obtained during the course of this study. No other warranty, expressed or implied, is made.

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FIGURES AND PHOTOGRAPHS

APPENDIX A:
METHODS

ESA reviewed existing information and conducted an on-site investigation to identify and assess streams and wetlands.

REVIEW OF EXISTING INFORMATION

ESA reviewed existing literature, maps, and other materials to identify wetlands or site characteristics indicative of wetlands in the study area. These sources can only indicate the likelihood of the presence of wetlands; actual wetland determinations must be based upon data obtained from field investigations. Key sources of information included the following:

- Soil Survey of King County (NRCS, 2003);
- Wetland and stream mapping from the National Wetland Inventory (NWI) and the City of Issaquah (NWI, 2010; City, 2010);
- Final Wetland Report and Conceptual Mitigation Plan: I-90 Undercrossing Project (Jones and Stokes, 2005);
- I-90 Undercrossing Final Mitigation Plan Drawings (The Watershed Company, 2010a);
- Darst Park Trail Plan Drawings (The Watershed Company, 2010b);
- Revised Critical Areas Study East Lake Sammamish Master Plan Trail—Issaquah Segment (Parametrix, 2011);
- Priority Habitats and Species data (WDFW, 2010);
- Rare plant or vegetation community mapping (WDNR, 2010);
- *City of Issaquah Shoreline Inventory and Characterization Report* (ESA Adolfson, 2008);
- *Critical Areas Report and Mitigation Plan for the Costco Issaquah Warehouse: Gas Station and Parking Expansion Project* (Sewall Wetland Consulting and Cedarock Consultants, 2011); and
- Historic aerial photographs (NETR Online, 1936, 1964, 1968, 1980, 1990, 1998, 2002, 2006).

WETLAND DEFINITION AND DELINEATION

Wetlands are formally defined by the U.S. Army Corps of Engineers (Corps) (Federal Register 1982), the Environmental Protection Agency (EPA) (Federal Register 1988), the Washington Shoreline Management Act (SMA) of 1971 and the Washington State Growth Management Act (GMA) as follows:

> *… those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas* (Federal Register, 1982, 1986).

In addition, the SMA and the GMA definitions add:

> *Wetlands do not include those artificial wetlands intentionally created from non-wetland site, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990 that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificially created wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.*

Methods defined in Western Mountains, Valleys, and Coast Regional Supplement (Corps, 2010) to the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual (Manual) were used to determine the presence and extent of wetlands in the study area. These methods are also consistent with state requirements in WAC 173-22-035.

The methodology outlined in the manuals is based upon three essential characteristics of wetlands: (1) hydrophytic vegetation; (2) hydric soils; and (3) wetland hydrology. Field indicators of these three characteristics must all be present in order to determine that an area is a wetland (unless problem areas or atypical situations are encountered). These characteristics are discussed below.

The "routine on-site determination method" was used to determine wetland boundaries that had not been previously delineated. Formal data plots were established where information regarding each of the three wetland parameters (vegetation, soils, and hydrology) was recorded. This information was used to distinguish wetlands from non-wetlands. If wetlands were determined to be present within the study area, wetland boundaries were delineated with sequentially numbered colored pin flags or flagging. Data plot locations were also marked with colored flagging. Data sheets for each of the formal data plots evaluated for this project are provided in Appendix D.

Vegetation

Plants must be specially adapted for life under saturated or anaerobic conditions to grow in wetlands. The U.S. Fish and Wildlife Service (USFWS) has determined the estimated probability of each plant species' occurrence in wetlands and has accordingly assigned a "wetland indicator status" (WIS) to each species (USFWS, 2013). Plants are categorized as obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), upland (UPL), not listed (NL), or no indicator status (NI). Definitions for each indicator status are listed below. Species with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions. Such species are referred to as "hydrophytic" vegetation.

Key to Wetland Indicator Status codes – Northwest Region (Source: USFWS, 2013):

OBL <u>Obligate</u>: species that almost always occur wetlands under natural conditions (est. probability >99%).

FACW <u>Facultative wetland</u> : species that usually occur in wetlands (est. probability 67 to 99%), but are occasionally found in non-wetlands.

FAC Facultative: Species that are equally likely to occur in wetlands or non-wetlands (est. probability 34 to 66%).

FACU Facultative upland: species that usually occur in non-wetlands (est. probability 67 to 99%), but are occasionally found in wetlands.

UPL Upland: species that almost always occur in non-wetlands under normal conditions (est. probability >99%).

NL Not listed: species that are not listed by USFWS (1988, 1993) and are presumed to be upland species.

NI No indicator: species for which insufficient information is available to determine status, or which were not evaluated by USFWS.

Areas of relatively homogeneous vegetative composition can be characterized by "dominant" species. The indicator status of the dominant species within each vegetative stratum is used to determine if the plant community may be characterized as hydrophytic. The vegetation of an area is considered to be hydrophytic if more than 50% of the dominant species have an indicator status of OBL, FACW, or FAC. The Regional Supplement provides additional tests for evaluating the presence of hydrophytic vegetation communities including the prevalence index, morphological adaptations, and wetland non-vascular plants. The Supplements also address difficult situations where hydrophytic vegetation indicators are not present but hydric soils and wetland hydrology are observed.

Soils

Hydric soils are indicative of wetlands. Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile (Federal Register, 1994). The Natural Resources Conservation Service (NRCS), in cooperation with the National Technical Committee for Hydric Soils, has compiled lists of hydric soils (NRCS, 1995). These lists identify soil series mapped by the NRCS that meet hydric soil criteria. It is common, however, for a map unit of non-wetland (non-hydric) soil to have inclusions of hydric soil, and vice versa. Therefore, field examination of soil conditions is important to determine if hydric soil conditions exist.

The NRCS has developed a guide for identifying field indicators of hydric soils (NRCS, 2010). This list of hydric soil indicators is considered to be dynamic; revisions are anticipated to occur on a regular basis as a result of ongoing studies of hydric soils. In general, anaerobic conditions create certain characteristics in hydric soils, collectively known as "redoximorphic features," that can be observed in the field (Vepraskas, 1999). Redoximorphic features include high organic content, accumulation of sulfidic material (rotten egg odor), greenish- or bluish-gray color (gley formation), spots or blotches of different color interspersed with the dominant or matrix color (mottling), and dark soil colors (low soil chroma) (NRCS, 2010; Vepraskas, 1999). Soil colors are described both by common color name (for example, "dark brown") and by a numerical description of their hue, value, and chroma (for example, 10YR 2/2) as identified on a Munsell soil color chart (Munsell Color, 2000). Soil color is determined from a moist soil sample.

The Regional Supplement provides methods for difficult situations where hydric soil indicators are not observed, but indicators of hydrophytic vegetation and wetland hydrology are present.

Hydrology

Water must be present in order for wetlands to exist; however, it need not be present throughout the entire year. Wetland hydrology is considered to be present when there is permanent or periodic inundation or soil saturation at or near the soil surface for more than 12.5% of the growing season (typically two weeks in lowland Pacific Northwest areas). Areas that are inundated or saturated for between 5% and 12.5% of the growing season in most years may or may not be wetlands. Areas inundated or saturated for less than 5% of the growing season are non-wetlands (Corps, 1987, 2010).

Indicators of wetland hydrology include observation of ponding or soil saturation, water marks, drift lines, drainage patterns, sediment deposits, oxidized rhizospheres, water-stained leaves, and local soil survey data. Where positive indicators of wetland hydrology are observed, it is assumed that wetland hydrology occurs for a sufficient period of the growing season to meet the wetland criteria, as described by the Corps (1987 and 2010). The Regional Supplements provide methods for evaluating situations in wetlands that periodically lack indicators of wetland hydrology but where hydric soils and hydrophytic vegetation are present.

CLASSIFYING WETLANDS

Two classification systems are commonly used to describe wetlands. The hydrogeomorphic (HGM) system describes wetlands in terms of their position in the landscape and the movement of water in the wetland (Brinson, 1993). The U.S. Fish and Wildlife Service classification system (Cowardin et al., 1979) describes wetlands in terms of their vegetation communities; these include, for example, emergent, scrub-shrub, and forested community types.

ASSESSING WETLAND FUNCTIONS

IMC 18.10.620.A specifies the use of Ecology's *Washington State Wetland Rating System for Western Washington—Revised* (Hruby, 2004) for rating wetlands. This rating system was developed by Ecology to differentiate wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the beneficial functions they provide to society. Although this system is designed to rate wetlands, it is based on whether a particular wetland performs a particular function and the relative level to which the function is performed. An assessment of wetland functions is inherent in the rating system. Appendix C provides additional information about the rating system wetland categories and completed rating forms for the project.

The rating system was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the functions they provide. In addition to rating a particular wetland, the rating system also provides a qualitative assessment of several wetland functions, including water quality improvement, flood flow alteration, and wildlife habitat. Wetlands are given points based on a series of questions regarding water quality, hydrologic, and habitat functions, and then scored into four categories: Category I (highest score) through Category

IV (lowest score). Because detailed scientific knowledge of wetland functions is limited, evaluations of the functions of individual wetlands are somewhat qualitative and dependent upon professional judgment.

IDENTIFYING STREAMS

ESA marked the locations of the ordinary high water (OHWM) of streams in the study area with blue and white striped flagging. For purposes of determining its lateral jurisdiction under the Clean Water Act (33 CFR 328.3(e)), the U.S. Army Corps of Engineers defines the OHWM as: "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (Corps, 2005). Other physical characteristics that should be used to determine the OHWM include wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; bed and banks; water staining; and a change in plant community (Corps, 2005).

Based on the definition in City code (IMC 18.10.390), streams were flagged along the ordinary high water mark (OHMW) with blue and white striped flagging.

APPENDIX B:
COMMON AND SCIENTIFIC NAMES OF PLANTS AND THEIR WETLAND INDICATOR STATUS

PLANT SPECIES LIST FOR THE PROJECT, IDENTIFIED DURING MARCH AND APRIL 2012

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR STATUS^
Trees		
big-leaf maple	*Acer macrophyllum*	FACU
bittercherry	*Prunus emarginata*	FACU
black cottonwood	*Populus trichocarpa (Populus balsamifera ssp. trichocarpa)*	FAC
black hawthorn	*Crataegus douglasii*	FAC
Douglas fir	*Pseudotsuga menziesii*	FACU
one-seed hawthorn	*Crataegus monogyna*	FACU
Oregon ash	*Fraxinus latifolia*	FACW
paper birch	*Betula papyrifera*	FAC
red alder	*Alnus rubra*	FAC
Sitka spruce	*Picea sitchensis*	FAC
western crabapple	*Pyrus fusca (Malus fusca)*	FACW
western red cedar	*Thuja plicata*	FAC
Shrubs		
baldhip rose	*Rosa gymnocarpa*	FACU
beaked hazelnut	*Corylus cornuta*	FACU
black twin-berry	*Lonicera involucrata*	FAC
butterfly-bush	*Buddleja davidii*	FACU
cascara	*Rhamnus purshiana (Frangula purshiana)*	FAC
clustered wild rose	*Rosa pisocarpa*	FAC
common snowberry	*Symphoricarpos albus*	FACU
Douglas' spiraea	*Spiraea douglasii*	FACW
dull Oregongrape	*Mahonia nervosa*	FACU
English holly	*Ilex aquifolium*	FACU
evergreen blackberry	*Rubus laciniatus*	FACU
Himalayan blackberry	*Rubus discolor (Rubus armenicus)*	FACU
Hooker willow	*Salix hookeriana*	FACW
Indian plum (osoberry)	*Oemleria cerasiformis*	FACU
Japanese knotweed	*Polygonum cuspidatum*	FACU
Nootka rose	*Rosa nutkana*	FAC
Pacific ninebark	*Physocarpus capitatus*	FACW

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR STATUS^
Pacific willow	*Salix lasiandra* *(Salix lucida ssp. lasiandra)*	FACW
red elderberry	*Sambucus racemosa*	FACU
redflowering currant	*Ribes sanguineum*	FACU
red-osier dogwood (western red osier)	*Cornus stolonifera* *(Cornus sericea)*	FACW
salal	*Gaultheria shallon*	FACU
salmonberry	*Rubus spectabilis*	FAC
Scouler willow	*Salix scouleriana*	FAC
Sitka willow	*Salix sitchensis*	FACW
tall Oregongrape	*Mahonia aquifolium*	FACU
thimbleberry	*Rubus parviflorus*	FAC
vine maple	*Acer circinatum*	FAC
Herbs		
American vetch	*Vicia americana*	FAC
American water–parsley	*Oenanthe sarmentosa*	OBL
American water–plantain	*Alisma plantago-aquatica*	OBL
bracken fern	*Pteridium aquilinum*	FACU
bull thistle	*Cirsium vulgare*	FACU
Canadian thistle	*Cirsium arvense*	FAC
colonial bentgrass	*Agrostis tenuis* *(Agrostis capillaris)*	FAC
common cattail	*Typha latifolia*	OBL
common dandelion	*Taraxacum officinale*	FACU
common plantain	*Plantago major*	FACU
common scouring-rush	*Equisetum hyemale*	FACW
common velvetgrass	*Holcus lanatus*	FAC
common vetch	*Vicia sativa*	UPL
Cooley's hedge-nettle	*Stachys cooleyae*	FACW
creeping buttercup	*Ranunculus repens*	FACW
curly dock	*Rumex crispus*	FAC
English ivy	*Hedera helix*	FACU
English plantain	*Plantago lanceolata*	FAC
field horsetail	*Equisetum arvense*	FAC
giant horsetail	*Equisetum telmateia*	FACW
hairy cats-ear	*Hypochaeris radicata*	FACU
herb Robert	*Geranium robertanium*	FACU
lady fern	*Athyrium filix-femina*	FAC

COMMON NAME	SCIENTIFIC NAME	WETLAND INDICATOR STATUS^
large-leaf avens	*Geum macrophyllum*	FACW
orchard-grass	*Dactylis glomerata*	FACU
Pacific blackberry (dewberry)	*Rubus ursinus*	FACU
Pacific bleedingheart	*Dicentra formosa*	FACU
pig-a-back-plant	*Tolmiea menziesii*	FAC
red clover	*Trifolium pratense*	FACU
red fescue	*Festuca rubra*	FAC
reed canarygrass	*Phalaris arundinacea*	FACW
skunk cabbage	*Lysichitum americanum (Lysichiton americanus)*	OBL
small-fruited bulrush	*Scirpus microcarpus*	OBL
soft rush	*Juncus effusus*	FACW
stinging nettle	*Urtica dioica*	FAC
sword fern	*Polystichum munitum*	FACU
tall fescue	*Festuca arundinacea (Lolium arundinaceum)*	FAC
Watson's willow-weed	*Epilobium watsonii (Epilobium ciliatum ssp. watsonii)*	FACW
white clover	*Trifolium repens*	FAC

^Key to Wetland Indicator Status codes – Northwest Region (Source: USFWS, 2013):

OBL Obligate: species that almost always occur wetlands under natural conditions (est. probability >99%).

FACW Facultative wetland : species that usually occur in wetlands (est. probability 67 to 99%), but are occasionally found in non-wetlands.

FAC Facultative: Species that are equally likely to occur in wetlands or non-wetlands (est. probability 34 to 66%).

FACU Facultative upland: species that usually occur in non-wetlands (est. probability 67 to 99%), but are occasionally found in wetlands.

UPL Upland: species that almost always occur in non-wetlands under normal conditions (est. probability >99%).

NL Not listed: species that are not listed by USFWS (2013) and are presumed to be upland species.

NI No indicator: species for which insufficient information is available to determine status, or which were not evaluated by USFWS.

APPENDIX C: ECOLOGY RATING FORMS

Washington State Wetland Rating System

The observed wetlands were rated using the Washington State Department of Ecology's *Wetland Rating System for Western Washington* (Hruby, 2004). This system was developed by Ecology to differentiate wetlands based on their sensitivity to disturbance, their significance, their rarity, our ability to replace them, and the beneficial functions they provide to society. Wetlands are categorized using the Ecology rating system according to the following criteria:

Category I wetlands represent a unique or rare wetland type; or are more sensitive to disturbance; or are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime.

Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions.

Category III wetlands have a moderate level of function. They have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.

Category IV wetlands have the lowest levels of functions and are often heavily disturbed.

APPENDIX D: WETLAND DETERMINATION DATA SHEETS

Wetland name or number Wetland B

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland B — Date of site visit: Mar and Apr 2012

Rated by: B. Rylander Trained by Ecology? Yes ☒ No ☐ — Date of training: Oct 2007

SEC: _____ TOWNSHP: _____ RNGE: _____ — Is S/T/R in Appendix D? Yes ☐ No ☐

Map of wetland unit: Figure 5 Estimated size > 0.09 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: ☐ I ☐ II ☐ III ☒ IV

Category I =	Score > 70	Score for Water Quality Functions	8
Category II =	Score 51 - 69	Score for Hydrologic Functions	12
Category III =	Score 30 – 50	Score for Habitat Functions	7
Category IV =	Score < 30	TOTAL Score for Functions	27

Category based on SPECIAL CHARACTERISTCS of Wetland ☐ I ☐ II ☒ Does not apply

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

Summary of basic information about the wetland unit.

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

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☒
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

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

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

Wetland name or number Wetland B

Classification of Vegetated Wetlands for Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   ☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   ☐ **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is 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 meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   ☒ NO – go to 4 ☐ **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☐ The wetland is on a slope *(slope can be very gradual)*.
   ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☐ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   ☒ NO – go to 5 ☐ **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☐ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☐ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   ☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 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 your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

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

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

Wetland name or number Wetland B

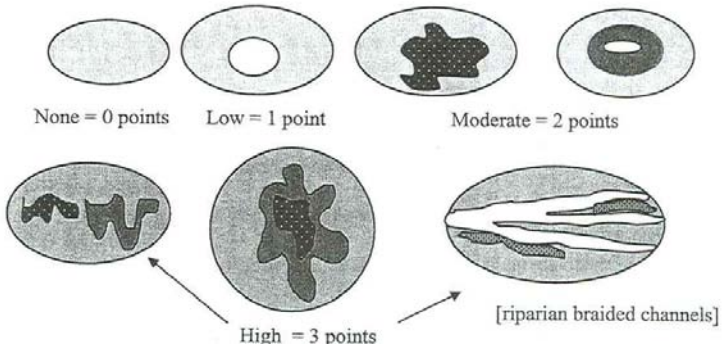
D	Depressional and Flat Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
D 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☐ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☒ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **1**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 ☐ • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 ☒ • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **1**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☒ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☐ **Map of Hydroperiods**	**Figure** ☐ **2**
	Total for D 1 *Add the points in the boxes above*	**4**
D 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☒ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 44)* Multiplier 2
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	8
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☐ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	0
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland ..... points = 5 ☐ • 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 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water . points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☐	3
	D 3.3 Contribution of wetland unit 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 unit ..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 ☒ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☐ • Entire unit is in the FLATS class ..... points = 5 ☐	3
	Total for D 3 *Add the points in the boxes above*	6

Wetland name or number Wetland B

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	12

Comments: _____

Wetland name or number Wetland B

These questions apply to wetlands of all HGM classes.		**Points** (only 1 score per box)
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	
H 1	**Does the wetland have the <u>potential</u> to provide habitat for many species?**	
	H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☒ Emergent plants ☒ Scrub/shrub (areas where shrubs have > 30% cover) ☐ Forested (areas where trees have > 30% cover) *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. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 ☐ 3 structures..... points = 2 ☐ 2 structures..... points = 1 ☒ 1 structure ..... points = 0 ☐	**Figure** ☐ **1**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☐ Permanently flooded or inundated — 4 or more types present points = 3 ☐ ☒ Seasonally flooded or inundated — 3 or more 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** **Map of hydroperiods**	**Figure** ☐ **1**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *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 ☐ List species below if you want to: < 5 species ..... points = 0 ☒ _____	0
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure** ☐ **1**
	H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	0
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**3**

Wetland name or number Wetland B

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference ..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... **points = 3** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ Heavy grazing in buffer ..... **points = 1** ☒ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☐ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ☐** **0**
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* ☐ YES = **4 points** (go to H 2.3) ☒ NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (go to H 2.3) ☒ NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR ☒ YES = 1 point • Within 1 mile of a lake greater than 20 acres? ☐ NO = 0 points	1

Comments: _____

Wetland name or number Wetland B

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	0
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.... points = 5 ☐ • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 5 ☐ • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 ☒ • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 3 ☐ • There is at least 1 wetland within 1/2 mile ..... points = 2 ☐ • There are no wetlands within 1/2 mile..... points = 0 ☐	3
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	4
	TOTAL for H 1 from page 8	3
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	7

Comments: _____

Wetland name or number Wetland B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit 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	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. 1** ☐
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** ☐ **Cat. II** ☐ **Dual Rating I/II** ☐
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* ☐ S/T/R information from Appendix D ☒ or accessed from WNHP/DNR web site ☐ YES Contact WNHP/DNR (see p. 79) and go to SC 2.2 ☒ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? ☐ YES = Category 1 ☐ NO not a Heritage Wetland	**Cat I** ☐
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? ☐ YES = go to question 3 ☒ NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES = go to question 3 ☒ NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? ☐ YES = Is a bog for purpose of rating ☐ NO = go to question 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? ☐ YES = Category I ☐ NO = Is not a bog for purpose of rating	**Cat. I** ☐

Wetland name or number Wetland B

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); 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. ☐ YES = Category I ☒ NO = not a forested wetland with special characteristics	**Cat. I** ☐
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ 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 surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* ☐ YES = Go to SC 5.1 ☒ NO not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 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 acre (4350 square ft.) ☐ YES = Category I ☐ NO = Category II	**Cat. I** ☐ **Cat. II** ☐
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES = Go to SC 6.1 ☒ NO not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? ☐ YES = Category II ☐ NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	N/A

Comments: _____

Wetland name or number Wetland C

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland C — Date of site visit: Mar and Apr 2012

Rated by: B. Rylander Trained by Ecology? Yes ☒ No ☐ — Date of training: Oct 2007

SEC: _____ TOWNSHP: _____ RNGE: _____ — Is S/T/R in Appendix D? Yes ☐ No ☐

Map of wetland unit: Figure 5 Estimated size 355 s.f.

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: ☐ **I** ☐ **II** ☐ **III** ☒ **IV**

Category I =	Score > 70	Score for Water Quality Functions	**8**
Category II =	Score 51 - 69	Score for Hydrologic Functions	**6**
Category III =	Score 30 – 50	Score for Habitat Functions	**4**
Category IV =	Score < 30	TOTAL Score for Functions	**18**

Category based on SPECIAL CHARACTERISTCS of Wetland ☐ **I** ☐ **II** ☒ **Does not apply**

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

Summary of basic information about the wetland unit.

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

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	**YES**	**NO**
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☒
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

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

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

Wetland name or number Wetland C

Classification of Vegetated Wetlands for Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   ☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   ☐ **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is 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 meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   ☒ NO – go to 4 ☐ **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☐ The wetland is on a slope *(slope can be very gradual)*.
   ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☐ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   ☒ NO – go to 5 ☐ **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☐ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☐ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   ☒ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 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 your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

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

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

Wetland name or number Wetland C

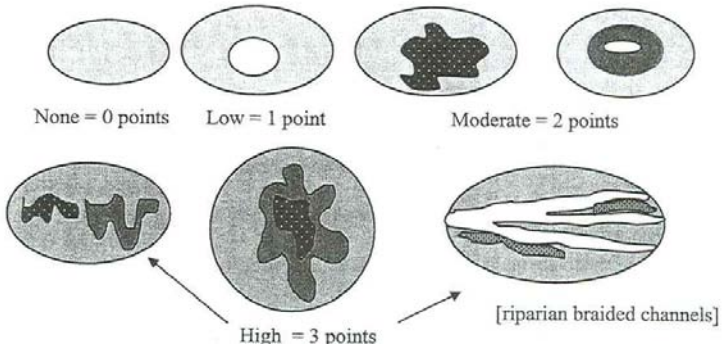
D	Depressional and Flat Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
D 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☐ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☒ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **1**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 ☒ • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 ☐ • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **3**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☐ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☒ **Map of Hydroperiods**	**Figure** ☐ **0**
	Total for D 1 *Add the points in the boxes above*	**4**
D 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☒ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 44)* Multiplier 2
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	8
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☐ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	0
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland ..... points = 5 ☐ • 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 ☐ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water . points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☒	0
	D 3.3 Contribution of wetland unit 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 unit ..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 ☒ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☐ • Entire unit is in the FLATS class ..... points = 5 ☐	3
	Total for D 3 *Add the points in the boxes above*	3

Wetland name or number Wetland C

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	6

Comments: _____

Wetland name or number Wetland C

These questions apply to wetlands of all HGM classes.		**Points** (only 1 score per box)
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	
H 1	**Does the wetland have the <u>potential</u> to provide habitat for many species?**	
	H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☒ Emergent plants ☐ Scrub/shrub (areas where shrubs have > 30% cover) ☐ Forested (areas where trees have > 30% cover) *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. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more ..... points = 4 ☐ 3 structures ..... points = 2 ☐ 2 structures ..... points = 1 ☐ 1 structure ..... points = 0 ☒	**Figure** ☐ **0**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☐ Permanently flooded or inundated — 4 or more types present points = 3 ☐ ☐ Seasonally flooded or inundated — 3 or more 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** **Map of hydroperiods**	**Figure** ☐ **0**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *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 ☐ List species below if you want to: < 5 species ..... points = 0 ☒ _____	0
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure** ☐ **0**
	H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	0
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**0**

Wetland name or number Wetland C

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference ..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... **points = 3** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ Heavy grazing in buffer ..... **points = 1** ☒ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☐ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ☐** **0**
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* ☐ YES = **4 points** (go to H 2.3) ☒ NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (go to H 2.3) ☒ NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR ☒ YES = 1 point • Within 1 mile of a lake greater than 20 acres? ☐ NO = 0 points	1

Comments: _____

Wetland name or number Wetland C

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	0
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.... points = 5 ☐ • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 5 ☐ • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 ☒ • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 3 ☐ • There is at least 1 wetland within 1/2 mile ..... points = 2 ☐ • There are no wetlands within 1/2 mile..... points = 0 ☐	3
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	4
	TOTAL for H 1 from page 8	0
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	4

Comments: _____

Wetland name or number Wetland C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit 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	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. 1** ☐
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** ☐ **Cat. II** ☐ **Dual Rating I/II** ☐
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* ☐ S/T/R information from Appendix D ☒ or accessed from WNHP/DNR web site ☐ YES Contact WNHP/DNR (see p. 79) and go to SC 2.2 ☒ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? ☐ YES = Category 1 ☐ NO not a Heritage Wetland	**Cat I** ☐
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? ☐ YES = go to question 3 ☒ NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES = go to question 3 ☒ NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? ☐ YES = Is a bog for purpose of rating ☐ NO = go to question 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? ☐ YES = Category I ☐ NO = Is not a bog for purpose of rating	**Cat. I** ☐

Wetland name or number Wetland D

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); 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. ☐ YES = Category I ☒ NO = not a forested wetland with special characteristics	**Cat. I** ☐
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ 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 surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* ☐ YES = Go to SC 5.1 ☒ NO not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 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 acre (4350 square ft.) ☐ YES = Category I ☐ NO = Category II	**Cat. I** ☐ **Cat. II** ☐
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES = Go to SC 6.1 ☒ NO not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? ☐ YES = Category II ☐ NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	N/A

Comments: _____

Wetland name or number Wetland D

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland D — Date of site visit: Mar and Apr 2012

Rated by: B. Rylander Trained by Ecology? Yes ☒ No ☐ — Date of training: Oct 2007

SEC: _____ TOWNSHP: _____ RNGE: _____ — Is S/T/R in Appendix D? Yes ☐ No ☐

Map of wetland unit: Figure 5 Estimated size > 0.42 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: ☐ I ☐ II ☐ III ☒ IV

Category I =	Score > 70	Score for Water Quality Functions	8
Category II =	Score 51 - 69	Score for Hydrologic Functions	12
Category III =	Score 30 – 50	Score for Habitat Functions	9
Category IV =	Score < 30	TOTAL Score for Functions	29

Category based on SPECIAL CHARACTERISTCS of Wetland ☐ I ☐ II ☒ Does not apply

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

Summary of basic information about the wetland unit.

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

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☐	☒
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

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

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

Wetland name or number Wetland D

Classification of Vegetated Wetlands for Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   ☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   ☐ **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is 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 meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   ☒ NO – go to 4 ☐ **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☐ The wetland is on a slope *(slope can be very gradual)*.
   ☐ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☐ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   ☒ NO – go to 5 ☐ **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☐ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☐ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   ☐ NO – go to 6 ☐ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 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 your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

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

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

Wetland name or number Wetland D

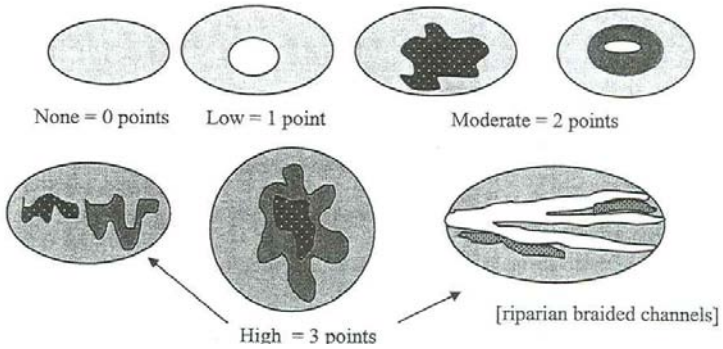
D	Depressional and Flat Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
D 1	**Does the wetland have the <u>potential</u> to improve water quality?**	*(see p.38)*
	D 1.1 Characteristics of surface water flows out of the wetland: • Unit is a depression with no surface water leaving it (no outlet) ..... points = 3 ☐ • Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ... points = 2 ☐ • Unit has an unconstricted, or slightly constricted, surface outlet (*permanently flowing*) .. points = 1 ☒ • Unit is a "flat" depression (Q.7 on key), or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* **Provide photo or drawing**	**Figure** ☐ **1**
	D 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (*use NRCS definitions*) YES points = 4 NO points = 0	0
	D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): • Wetland has persistent, ungrazed vegetation > = 95% of area ..... points = 5 ☐ • Wetland has persistent, ungrazed vegetation > = 1/2 of area ..... points = 3 ☐ • Wetland has persistent, ungrazed vegetation > = 1/10 of area ..... points = 1 ☒ • Wetland has persistent, ungrazed vegetation < 1/10 of area ..... points = 0 ☐ **Map of Cowardin vegetation classes**	**Figure** ☐ **1**
	D 1.4 Characteristics of seasonal ponding or inundation: *This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.* • Area seasonally ponded is > 1/2 total area of wetland ..... points = 4 ☐ • Area seasonally ponded is > 1/4 total area of wetland ..... points = 2 ☒ • Area seasonally ponded is < 1/4 total area of wetland ..... points = 0 ☐ **Map of Hydroperiods**	**Figure** ☐ **2**
	Total for D 1 *Add the points in the boxes above*	**4**
D 2	**Does the wetland have the <u>opportunity</u> to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland? *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☒ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ Wetland is fed by groundwater high in phosphorus or nitrogen ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 44)* Multiplier 2
◆	**<u>TOTAL</u> – Water Quality Functions** Multiply the score from D1 by D2; then ***add score to table on p. 1***	8
	HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.	
D 3	**Does the wetland have the <u>potential</u> to reduce flooding and erosion?**	*(see p.46)*
	D 3.1 Characteristics of surface water flows out of the wetland unit • Unit is a depression with no surface water leaving it (no outlet) ..... points = 4 ☐ • Unit has an intermittently flowing, OR highly constricted permanently flowing outlet .... points = 2 ☐ • Unit is a "flat" depression (Q.7 on key) or in the Flats class, with permanent surface outflow **and no obvious natural outlet** and/or outlet is a man-made ditch ..... points = 1 ☐ *(If ditch is not permanently flowing treat unit as "intermittently flowing")* • Unit has an unconstricted, or slightly constricted, surface outlet *(permanently flowing)* ..... points = 0	0
	D 3.2 Depth of storage during wet periods. *Estimate the height of ponding above the bottom of the outlet. For units with no outlet measure from the surface of permanent water or deepest part (if dry).* • Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7 ☐ • The wetland is a "headwater" wetland ..... points = 5 ☐ • 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 ☒ • Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water . points = 1 ☐ • Marks of ponding less than 0.5 ft ..... points = 0 ☐	3
	D 3.3 Contribution of wetland unit 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 unit ..... points = 5 ☐ • The area of the basin is 10 to 100 times the area of the unit ..... points = 3 ☒ • The area of the basin is more than 100 times the area of the unit ..... points = 0 ☐ • Entire unit is in the FLATS class ..... points = 5 ☐	3
	Total for D 3 *Add the points in the boxes above*	6

Wetland name or number Wetland D

D 4	**Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?** Answer YES if the unit is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as flood gate, tide gate, flap valve, reservoir etc. OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. *Note which of the following indicators of opportunity apply.* ☐ Wetland is in a headwater of a river or stream that has flooding problems. ☒ Wetland drains to a river or stream that has flooding problems ☐ Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems ☐ Other _____ ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p. 49)* Multiplier 2
◆	**<u>TOTAL</u> – Hydrologic Functions** Multiply the score from D3 by D4; then ***add score to table on p. 1***	12

Comments: _____

Wetland name or number Wetland D

These questions apply to wetlands of all HGM classes.		**Points** (only 1 score per box)
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	
H 1	**Does the wetland have the <u>potential</u> to provide habitat for many species?**	
	H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☒ Emergent plants ☐ Scrub/shrub (areas where shrubs have > 30% cover) ☒ Forested (areas where trees have > 30% cover) *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. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more ..... points = 4 ☐ 3 structures ..... points = 2 ☐ 2 structures ..... points = 1 ☒ 1 structure ..... points = 0 ☐	**Figure ☐** **1**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☐ Permanently flooded or inundated — 4 or more types present points = 3 ☐ ☒ Seasonally flooded or inundated — 3 or more 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** **Map of hydroperiods**	**Figure ☐** **2**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *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 ☒ List species below if you want to: < 5 species ..... points = 0 ☐ _____	1
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure ☐** **1**
	H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☐ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☐ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☐ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	0
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**5**

Wetland name or number Wetland D

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference ..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... **points = 3** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK..... **points = 2** ☐ Heavy grazing in buffer ..... **points = 1** ☒ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☐ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ☐** **0**
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* ☐ YES = **4 points** (go to H 2.3) ☒ NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (go to H 2.3) ☒ NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR ☒ YES = 1 point • Within 1 mile of a lake greater than 20 acres? ☐ NO = 0 points	1

Comments: _____

Wetland name or number Wetland D

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☐ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☐ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	0
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.... points = 5 ☐ • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 5 ☐ • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 ☒ • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 3 ☐ • There is at least 1 wetland within 1/2 mile ..... points = 2 ☐ • There are no wetlands within 1/2 mile..... points = 0 ☐	3
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	4
	TOTAL for H 1 from page 8	5
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	9

Comments: _____

Wetland name or number Wetland D

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit 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	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. 1** ☐
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** ☐ **Cat. II** ☐ **Dual Rating I/II** ☐
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* ☐ S/T/R information from Appendix D ☒ or accessed from WNHP/DNR web site ☐ YES Contact WNHP/DNR (see p. 79) and go to SC 2.2 ☒ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? ☐ YES = Category 1 ☐ NO not a Heritage Wetland	**Cat I** ☐
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? ☐ YES = go to question 3 ☒ NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES = go to question 3 ☒ NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? ☐ YES = Is a bog for purpose of rating ☐ NO = go to question 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? ☐ YES = Category I ☐ NO = Is not a bog for purpose of rating	**Cat. I** ☐

Wetland name or number Wetland D

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); 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. ☐ YES = Category I ☒ NO = not a forested wetland with special characteristics	**Cat. I** ☐
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ 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 surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* ☐ YES = Go to SC 5.1 ☒ NO not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 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 acre (4350 square ft.) ☐ YES = Category I ☐ NO = Category II	**Cat. I** ☐ **Cat. II** ☐
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES = Go to SC 6.1 ☒ NO not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? ☐ YES = Category II ☐ NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	N/A

Comments: _____

Wetland name or number Wetland V

WETLAND RATING FORM – WESTERN WASHINGTON

Version 2 – Updated July 2006 to increase accuracy and reproducibility among users
Updated Oct. 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wetland V — Date of site visit: March 2012

Rated by: B. Rylander Trained by Ecology? Yes ☒ No ☐ — Date of training: Oct 2007

SEC: _____ TOWNSHP: _____ RNGE: _____ — Is S/T/R in Appendix D? Yes ☐ No ☐

Map of wetland unit: Figure 5 Estimated size > 0.3 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland: ☐ I ☐ II ☒ III ☐ IV

Category I =	Score > 70	Score for Water Quality Functions	16
Category II =	Score 51 - 69	Score for Hydrologic Functions	12
Category III =	Score 30 – 50	Score for Habitat Functions	17
Category IV =	Score < 30	TOTAL Score for Functions	45

Category based on SPECIAL CHARACTERISTCS of Wetland ☐ I ☐ II ☒ **Does not apply**

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

Summary of basic information about the wetland unit.

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

Does the wetland being rated meet any of the criteria below? If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check List for Wetlands that Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. *Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered **animal or plant** species (T/E species)?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.	☐	☒
SP2. *Has the wetland unit been documented as habitat for any State listed Threatened or Endangered **animal** species?* For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category 1 Natural Heritage Wetlands (see p. 19 of data form).	☐	☒
SP3. *Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?*	☒	☐
SP4. *Does the wetland unit have a local significance in addition to its functions?* For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.	☐	☒

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

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

Wetland name or number Wetland V

Classification of Vegetated Wetlands for Western Washington

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

1. Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?
   ☒ NO – go to 2 ☐ **YES** – the wetland class is **Tidal Fringe**
   If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?
   ☐ **YES – Freshwater Tidal Fringe** ☐ **NO – Saltwater Tidal Fringe (Estuarine)**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is a Saltwater Tidal Fringe it is rated as an **Estuarine** wetland.* Wetlands that were call estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. _____).

2. The entire wetland unit is flat and precipitation is 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 meet both of the following criteria?
   ☐ The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) where at least 20 acres (8ha) in size;
   ☐ At least 30% of the open water area is deeper than 6.6 (2 m)?
   ☒ NO – go to 4 ☐ **YES** – The wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland meet all of the following criteria?
   ☐ The wetland is on a slope *(slope can be very gradual)*.
   ☒ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
   ☐ The water leaves the wetland **without being impounded**?
   NOTE: *Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).*
   ☒ NO – go to 5 ☐ **YES** – The wetland class is **Slope**

5. Does the entire wetland meet all of the following criteria?
   ☒ The unit is in a valley or stream channel where it gets inundated by overbank flooding from that stream or river.
   ☒ The overbank flooding occurs at least once every two years.
   NOTE: *The riverine unit can contain depressions that are filled with water when the river is not flooding..*
   ☐ NO – go to 6 ☒ **YES** – The wetland class is **Riverine**

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time of 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 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 your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

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

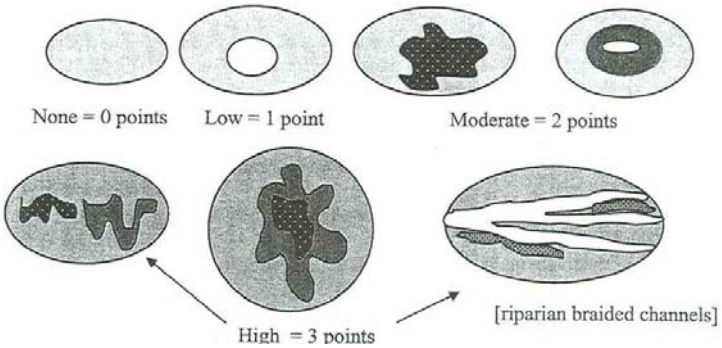
If you are unable still to determine which of the above criteria apply to your wetland, or you have more than 2 HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

Wetland name or number Wetland V

R	Riverine and Freshwater Tidal Fringe Wetlands	Points (only 1 score per box)
	WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.	
R 1	**Does the wetland have the potential to improve water quality?** *(see p.52)*	
	R 1.1 Area of surface depressions within the riverine wetland that can trap sediments during a flooding event: • Depressions cover > 3/4 area of wetland ..... points = 8 ☐ • Depressions cover > 1/2 area of wetland ..... points = 4 ☐ **(If depressions > 1/2 of area of unit draw polygons on aerial photo or map)** • Depressions present but cover < 1/2 area of wetland. ..... points = 2 ☒ • No depressions present ..... points = 0 ☐	**Figure** ☐ **2**
	R 1.2 Characteristics of the vegetation in the unit (areas with >90% cover at person height): • Trees or shrubs > 2/3 area of the unit ..... points = 8 ☐ • Trees or shrubs > 1/3 area of the wetland ..... points = 6 ☒ • Ungrazed, herbaceous plants > 2/3 area of unit ..... points = 6 ☐ • Ungrazed herbaceous plants > 1/3 area of unit ..... points = 3 ☐ • Trees, shrubs, and ungrazed herbaceous < 1/3 area of unit ..... points = 0 ☐ **Aerial photo or map showing polygons of different vegetation types**	**Figure** ☐ **6**
	Add the points in the boxes above	**8**
R 2	**Does the wetland have the opportunity to improve water quality?** Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. *Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.* ☐ Grazing in the wetland or within 150 ft ☒ Untreated stormwater discharges to wetland ☐ Tilled fields or orchards within 150 ft. of wetland ☒ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging ☒ Residential, urban areas, golf courses are within 150 ft. of wetland ☐ The river or stream linked to the wetland has a contributing basin where human activities have raised levels of sediment, toxic compounds or nutrients in the river water above standards for water quality. ☐ Other _____ YES multiplier is 2 NO multiplier is 1	*(see p. 53)* Multiplier 2
◆	**TOTAL – Water Quality Functions** Multiply the score from R1 by R2; then ***add score to table on p. 1***	16
	HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.	
R 3	**Does the wetland have the potential to reduce flooding and erosion?**	*(see p.54)*
	R 3.1 Characteristics of the overbank storage the wetland provides: *Estimate the average width of the wetland perpendicular to the direction of the flow and the width of the stream or river channel (distance between banks). Calculate the ratio: (average width of unit) / (average width of stream between banks).* • If the ratio is more than 20 ..... points = 9 ☐ • If the ratio is between 10 – 20 ..... points = 6 ☐ • If the ratio is 5- <10 ..... points = 4 ☐ • If the ratio is 1- <5 ..... points = 2 ☒ • If the ratio is < 1 ..... points = 1 ☐ **Aerial photo or map showing average widths**	**Figure** ☐ **2**
	R 3.2 Characteristics of vegetation that slow down water velocities during floods: *Treat large woody debris as "forest or shrub". Choose the points appropriate for the best description. (polygons need to have >90% cover at person height NOT Cowardin classes):* • Forest or shrub for > 1/3 area OR herbaceous plants > 2/3 area ..... points = 7 ☐ • Forest or shrub for > 1/10 area OR herbaceous plants > 1/3 area ..... points = 4 ☒ • Vegetation does not meet above criteria ..... points = 0 ☐ **Aerial photo or map showing polygons of different vegetation types**	**Figure** ☐ **4**
	Add the points in the boxes above	**6**
R 4	**Does the wetland have the opportunity to reduce flooding and erosion?** Answer YES if the wetland is in a location in the watershed where the flood storage, or reduction in water velocity, it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. *Note which of the following conditions apply.* ☒ There are human structures and activities downstream (roads, buildings, bridges, farms) that can be damaged by flooding. ☒ There are natural resources downstream (e.g. salmon redds) that can be damaged by flooding ☐ Other _____ *(Answer NO if the major source of water to the wetland is controlled by a reservoir or the wetland is tidal fringe along the sides of a dike)* ☒ YES multiplier is 2 ☐ NO multiplier is 1	*(see p.57)* Multiplier 2
◆	**TOTAL – Hydrologic Functions** Multiply the score from R3 by R4; then ***add score to table on p. 1***	12

Comments: _____

Wetland name or number Wetland V

These questions apply to wetlands of all HGM classes.		**Points** (only 1 score per box)
	HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.	
H 1	**Does the wetland have the <u>potential</u> to provide habitat for many species?**	
	H 1.1 <u>Vegetation structure</u> *(see P. 72)*: *Check the types of vegetation classes present (as defined by Cowardin) – Size threshold for each class is 1/4 acre or more than 10% of the area if unit is smaller than 2.5 acres.* ☐ Aquatic Bed ☐ Emergent plants ☒ Scrub/shrub (areas where shrubs have > 30% cover) ☒ Forested (areas where trees have > 30% cover) *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. *Add the number of vegetation types that qualify. If you have:* **Map of Cowardin vegetation classes** 4 structures or more..... points = 4 ☐ 3 structures..... points = 2 ☐ 2 structures..... points = 1 ☒ 1 structure ..... points = 0 ☐	**Figure ☐** **1**
	H 1.2 <u>Hydroperiods</u> *(see p.73)*: *Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).* ☐ Permanently flooded or inundated — 4 or more types present points = 3 ☐ ☒ Seasonally flooded or inundated — 3 or more 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** **Map of hydroperiods**	**Figure ☐** **2**
	H 1.3 <u>Richness of Plant Species</u> *(see p. 75)*: Count the number of plant species in the wetland that cover at least 10 ft^2 *(different patches of the same species can be combined to meet the size threshold)* *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 ☒ List species below if you want to: < 5 species ..... points = 0 ☐ _____	1
	H 1.4 Interspersion of Habitats *(see p. 76)*: Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.  Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always "high". **Use map of Cowardin classes.**	**Figure ☐** **1**
	H 1.5 <u>Special Habitat Features</u> *(see p. 77)*: *Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.* ☒ Large, downed, woody debris within the wetland (> 4 in. diameter and 6 ft. long) ☒ Standing snags (diameter at the bottom > 4 inches) in the wetland ☐ Undercut banks are present for at least 6.6 ft. (2m) and/or overhanging vegetation extends at least 3.3 ft. (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft. (10m) ☐ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet turned grey/brown)* ☒ At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ☐ Invasive plants cover less than 25% of the wetland area in each stratum of plants *NOTE: The 20% stated in early printings of the manual on page 78 is an error.*	3
	H 1 TOTAL Score – potential for providing habitat *Add the points in the column above*	**8**

Wetland name or number Wetland V

H 2	**Does the wetland have the <u>opportunity</u> to provide habitat for many species?**	(only 1 score per box)
	H 2.1 <u>Buffers</u> *(see P. 80)*: *Choose the description that best represents condition of buffer of wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed".* ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% of circumference. No structures are within the undisturbed part of buffer (relatively undisturbed also means no grazing, no landscaping, no daily human use)..... **points = 5** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference ..... **points = 4** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 95% circumference..... **points = 4** ☐ 100m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference ..... **points = 3** ☐ 50m (170 ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference..... **points = 3** **If buffer does not meet any of the criteria above:** ☐ No paved areas (except paved trails) or buildings within 25m (80 ft) of wetland > 95% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ☒ No paved areas of buildings within 50m of wetland for > 50% circumference. Light to moderate grazing or lawns are OK ..... **points = 2** ☐ Heavy grazing in buffer ..... **points = 1** ☐ Vegetated buffers are < 2m wide (6.6 ft) for more than 95% circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland)..... **points = 0** ☐ Buffer does not meet any of the criteria above ..... **points = 1** **Arial photo showing buffers**	**Figure ☐** **2**
	H 2.2 <u>Corridors and Connections</u> *(see p. 81)* H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft. wide, has at least a 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? *(Dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor).* ☐ YES = **4 points** (go to H 2.3) ☐ NO = go to H 2.2.2 H. 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50 ft. wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? **OR a Lake-fringe** wetland, if it does not have an undisturbed corridor as in the question above? ☐ YES = **2 points** (go to H 2.3) ☐ NO = go to H 2.2.3 H. 2.2.3 Is the wetland: • Within 5 mi (8km) of a brackish or salt water estuary OR • Within 3 miles of a large field or pasture (> 40 acres) OR ☒ YES = 1 point • Within 1 mile of a lake greater than 20 acres? ☐ NO = 0 points	1

Comments: _____

Wetland name or number Wetland V

	H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82): *(see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report http://wdfw.wa.gov/hab/phslist.htm)* Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? *NOTE: the connections do not have to be relatively undisturbed.* ☐ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.4 ha (1 acre). ☐ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report p. 152*). ☐ **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock. ☐ **Old-growth/Mature forests:** (Old-growth west of Cascade crest) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) > 81 cm (32 in) dbh or > 200 years of age. **(**Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less that 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest. ☐ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158*). ☒ **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other. ☐ **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161*). ☒ **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources. ☐ **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).* ☐ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human. ☐ **Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft. ☐ **Talus:** Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs. ☐ **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 51 cm (20 in) in western Washington and are > 2 m (6.5 ft) in height. Priority logs are > 30 cm (12 in) in diameter at the largest end, and > 6 m (20 ft) long. If wetland has **3 or more** priority habitats **= 4 points** If wetland has **2** priority habitats = **3 points** If wetland has **1** priority habitat **= 1 point** No habitats = 0 points Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4)	3
	H 2.4 Wetland Landscape: *Choose the **one** description of the landscape around the wetland that best fits (see p. 84)* • There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development.... points = 5 ☐ • The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 5 ☐ • There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ..... points = 3 ☒ • The wetland fringe on a lake **with** disturbance and there are 3 other lake-fringe wetlands within 1/2 mile ..... points = 3 ☐ • There is at least 1 wetland within 1/2 mile ..... points = 2 ☐ • There are no wetlands within 1/2 mile..... points = 0 ☐	3
	H 2 TOTAL Score – opportunity for providing habitat *Add the scores from H2.1, H2.2, H2.3, H2.4*	9
	TOTAL for H 1 from page 8	8
◆	**Total Score for Habitat Functions** Add the points for H 1 and H 2; then ***record the result on p. 1***	17

Comments: _____

Wetland name or number Wetland V

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

	Wetland Type – *Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.*	
SC1	**Estuarine wetlands?** *(see p.86)* Does the wetland unit 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	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? ☐ YES = Category I ☐ NO = go to SC 1.2	**Cat. 1** ☐
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? ☐ YES = Category I ☐ NO = Category II ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native *Spartina* spp,. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of Spartina would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category 1. Do not, however, exclude the area of Spartina in determining the size threshold of 1 acre. ☐ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ☐ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	**Cat. I** ☐ **Cat. II** ☐ **Dual Rating I/II** ☐
SC2	**Natural Heritage Wetlands** *(see p. 87)* Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? *(This question is used to screen out most sites before you need to contact WNHP/DNR.)* ☐ S/T/R information from Appendix D ☒ or accessed from WNHP/DNR web site ☐ YES Contact WNHP/DNR (see p. 79) and go to SC 2.2 ☒ NO SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? ☐ YES = Category 1 ☐ NO not a Heritage Wetland	**Cat I** ☐
SC3	**Bogs** *(see p. 87)* Does the wetland **(or any part of the unit)** meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. ***If you answer yes you will still need to rate the wetland based on its function.*** 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? ☐ YES = go to question 3 ☒ NO = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? ☐ YES = go to question 3 ☒ NO = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? ☐ YES = Is a bog for purpose of rating ☐ NO = go to question 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" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover *(> 30% coverage of the total shrub/herbaceous cover*)? ☐ YES = Category I ☐ NO = Is not a bog for purpose of rating	**Cat. I** ☐

Wetland name or number Wetland V

SC4	**Forested Wetlands** *(see p. 90)* Does the wetland have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? *If you answer yes you will still need to rate the wetland based on its function.* ☐ **Old-growth forests**: (west of Cascade Crest) Stands of at least two three species forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm or more). NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The DFW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter. ☐ **Mature forests**: (west of the Cascade Crest) Stands where the largest trees are 80 – 200 years old OR have an average diameters (dbh) exceeding 21 inches (53 cm); 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. ☐ YES = Category I ☒ NO = not a forested wetland with special characteristics	**Cat. I** ☐
SC5	**Wetlands in Coastal Lagoons** *(see p. 91)* Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? ☐ 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 surface water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom.)* ☐ YES = Go to SC 5.1 ☒ NO not a wetland in a coastal lagoon SC 5.1 Does the wetland meet all of the following three conditions? ☐ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing) and has less than 20% cover of invasive plant species (see list of invasive species on p. 74). ☐ At least 3/4 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 acre (4350 square ft.) ☐ YES = Category I ☐ NO = Category II	**Cat. I** ☐ **Cat. II** ☐
SC6	**Interdunal Wetlands** *(see p. 93)* Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ☐ YES = Go to SC 6.1 ☒ NO not an interdunal wetland for rating ***If you answer yes you will still need to rate the wetland based on its functions.*** In practical terms that means the following geographic areas: • 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 SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger? ☐ YES = Category II ☐ NO = go to SC 6.2 SC 6.2 Is the wetland between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre? ☐ YES = Category III	**Cat. II** ☐ **Cat. III** ☐
◆	**Category of wetland based on Special Characteristics** *Choose the "highest" rating if wetland falls into several categories, and record on p. 1.* If you answered NO for all types enter "Not Applicable" on p. 1	N/A

Comments: _____

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 3/14/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-3
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): convex Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Upland plot adjacent to Wetland B, near East Lake Sammamish Trail. On bench above ditch.**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Rosa pisocarpa*	20	yes	FAC
2. *Rubus armeniacus*	5	yes	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = _____, 20% = _____	25	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	100	yes	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
50% = _____, 20% = _____	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	
% Bare Ground in Herb Stratum _____			

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	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: Issaquah LID

SOIL

Sampling Point: DP-3

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10 YR 3/1	75	7.5 YR 4/6	25	C	M	L	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☐	No	☒	Depth (inches):	_____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches):	_____

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

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

Remarks: Soil moist but not saturated

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 3-14-12
Applicant/Owner: State: WA Sampling Point: DP-4
Investigator(s): B. Rylander, K. Kosters Section, Township, Range:
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): Lat: Long: Datum:
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☒ No ☐**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **Located in Wetland B, in ditch adjacent to East Lake Sammamish trail (east side)**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
50% = , 20% =		= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1. *Prunus sp*	5	n/a*	NI
2. *Rubus armeniacus*	10	yes	FACU
3.			
4.			
5.			
50% = 3.5, 20% = 1.4	10	= Total Cover	
Herb Stratum (Plot size:)			
1. *Phalaris arundinacea*	100	yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
50% = 50, 20% = 20	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
50% = , 20% =		= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x1 =	
FACW species	100	x2 =	200
FAC species		x3 =	
FACU species	10	x4 =	40
UPL species		x5 =	
Column Totals:	110 (A)		240 (B)

Prevalence Index = B/A = 2.2

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: *excluded from calculations per chapter 2 guidance Majority of wetland is PEM class, few shrubs, blackberry, and ornamental trees (Prunus) along edges.

Project Site: Issaquah LID

SOIL

Sampling Point: DP-4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10 YR 3/2	100					L	
7-18	10 YR 3/1	85	7.5 YR 4/6	15	C	M	Gr SaL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	none
Water Table Present?	Yes	☒	No	☐	Depth (inches):	1
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	to surface

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

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

Remarks: Culvert at north edge of wetland drains stormwater from SE 56th St.

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 3/14/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-5
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): convex Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **south of wetland B, in upland. plot located between wetlands B and C**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prunus sp.*	30	n/a*	NI
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
50% = _____, 20% = _____	30	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Rubus laciniatus*	20	yes	FACU
2. *Rubus armeniacus*	5	yes	FACU
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
50% = _____, 20% = _____	25	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	100	yes	FACW
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
50% = _____, 20% = _____	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	_____	_____
2. _____	_____	_____	_____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks:

Project Site: Issaquah LID

SOIL

Sampling Point: DP-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR 3/2	100					SiL	
3-18	2.5 Y 4/1	65	7.5 YR 4/6	20	C	M	SiL	
			10 YR 2/1	15	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.)

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

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

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

Remarks:

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 3/14/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-6
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	☒	No	☐	**Is the Sampled Area within a Wetland?**	**Yes**	☒	**No** ☐
Hydric Soil Present?	Yes	☒	No	☐				
Wetland Hydrology Present?	Yes	☒	No	☐				

Remarks: **Wetland C is located in a ditch south of Wetland B.**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. ____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Rubus armeniacus*	10	yes	FACU
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = _____, 20% = _____	10	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	100	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = _____, 20% = _____	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	100	x2 =	200
FAC species	_____	x3 =	_____
FACU species	10	x4 =	40
UPL species	_____	x5 =	_____
Column Totals:	110 (A)		240 (B)

Prevalence Index = B/A = 2.2

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks:

Project Site: Issaquah LID

SOIL

Sampling Point: DP-6

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	2.5 Y 5/2	70	7.5 YR 4/4	30	C	M, PL	L	
4-18	10 YR 4/1	75	7.5 YR 4/6	25	C	M, PL	L	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☒	No	☐	Depth (inches):	12
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	8

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

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

Remarks: Depressional HGM, groundwater is primary hydrologic support

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 3/14/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-7
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): convex Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☐	No ☒		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Upland plot located next to Wetland D**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. ____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Symphoricarpos albus*	20	yes	FACU
2. *Rubus armeniacus*	25	yes	FACU
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = _____, 20% = _____	45	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	70	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = _____, 20% = _____	70	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☐ No ☒**

Remarks:

Project Site: Issaquah LID

SOIL

Sampling Point: DP-7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR 3/2	100					SiL	
12-16	10 YR 4/2	70	10 YR 4/6	30	C	M	SiL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☐ **No** ☒

Remarks: Does not meet depth requirements for indicator F3

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

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

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

Remarks:

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 3/14/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-8
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☒ No ☐**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **Wetland D-along East Lake Sammamish Trail, east side of trail.**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. ____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Symphoricarpos albus*	5	yes	FACU
2. *Rubus armeniacus*	20	yes	FACU
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = _____, 20% = _____	25	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	100	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = _____, 20% = _____	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	33	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	100	x2 =	200
FAC species	_____	x3 =	_____
FACU species	25	x4 =	100
UPL species	_____	x5 =	_____
Column Totals:	125 (A)		300 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: Cattails and alder observed in the wetland interior, outside of the plot

Project Site: Issaquah LID

SOIL

Sampling Point: DP-8

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10 YR 3/2	100					Gr. SaL	
8-20	10 YR 5/2	60	10 YR 4/6	40	C	M	Gr. SaL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☒	No	☐	Depth (inches):	10
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	8

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

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

Remarks: Depressional HGM, groundwater is primary hydrologic support. Standing water in wetland approx 1 ft away--majority of the wetland interior contains standing water

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 4/19/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-53
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): floodplain terrace Local relief (concave, convex, none): concave Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☐ No ☒**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☐	No ☒		

Remarks: **Upland plot along the bank of the North Fork of Issaquah Creek. In between the creek and 221st Pl.**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix babylonica*	35	yes	FAC
2. _____	_____	____	____
3. _____	_____	____	____
4. ____	_____	____	____
50% = _____, 20% = _____	35	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Rubus spectabilis*	2	no	FAC
2. *Corylus cornuta*	40	yes	FACU
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = _____, 20% = _____	42	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Rumex crispus*	2	no	FAC
2. *Ranunculus repens*	40	yes	FACW
3. *Agrostis sp.*	90	yes	FAC
4. *Taraxacum officinale*	5	no	FACU
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = _____, 20% = _____	137	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks:

Project Site: Issaquah LID

SOIL

Sampling Point: DP-53

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	10 YR 4/2	70	7.5 YR 4/4	30	C	M, PL	SiL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches): _____
Water Table Present?	Yes	☐	No	☒	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes	☐	No	☒	Depth (inches): _____

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

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

Remarks: Moist, not saturated

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

Project Site: Issaquah LID City/County: Issaquah/ Sampling Date: 4/19/2012
Applicant/Owner: City of Issaquah State: WA Sampling Point: DP-54
Investigator(s): B.Rylander, K. Kosters Section, Township, Range: _____
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave Slope (%): _____
Subregion (LRR): _____ Lat: _____ Long: _____ Datum: _____
Soil Map Unit Name: _____ NWI classification: _____
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)
Are Vegetation ☐, Soil ☐, or Hydrology ☐, significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐
Are Vegetation ☐, Soil ☐, or Hydrology ☐, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?**	**Yes ☒ No ☐**
Hydric Soil Present?	Yes ☒	No ☐		
Wetland Hydrology Present?	Yes ☒	No ☐		

Remarks: **Wetland V-east bank of North Fork of Issaquah Creek. Starts south of intersection of 62nd street and East Lake Sammamish Parkway. Trib 4 runs through wetland on east side. North Fork of Issaquah Creek runs south to north through the wetland interior. Wetland surrounded by steep banks that confine the stream channel.**

VEGETATION – Use scientific names of plants

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	____	____
2. _____	_____	____	____
3. _____	_____	____	____
4. ____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
Sapling/Shrub Stratum (Plot size: _____)			
1. *Cornus sericea*	10	yes	FACW
2. *Salix sitchensis*	10	yes	FACW
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
50% = _____, 20% = _____	20	= Total Cover	
Herb Stratum (Plot size: _____)			
1. *Phalaris arundinacea*	100	yes	FACW
2. _____	_____	____	____
3. _____	_____	____	____
4. _____	_____	____	____
5. _____	_____	____	____
6. _____	_____	____	____
7. _____	_____	____	____
8. _____	_____	____	____
9. _____	_____	____	____
10. _____	_____	____	____
11. _____	_____	____	____
50% = _____, 20% = _____	100	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1. _____	_____	____	____
2. _____	_____	____	____
50% = _____, 20% = _____	_____	= Total Cover	
% Bare Ground in Herb Stratum _____			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	_____	x1 =	_____
FACW species	_____	x2 =	_____
FAC species	_____	x3 =	_____
FACU species	_____	x4 =	_____
UPL species	_____	x5 =	_____
Column Totals:	_____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes ☒ No ☐**

Remarks: PEM/PSS wetland.

Project Site: Issaquah LID

SOIL

Sampling Point: DP-54

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	2.5 Y 3/1	80	7.5 YR 4/4	20	C	M, PL	SiL	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ☒ **No** ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes	☐	No	☒	Depth (inches):	_____
Water Table Present?	Yes	☒	No	☐	Depth (inches):	5
Saturation Present? (includes capillary fringe)	Yes	☒	No	☐	Depth (inches):	to surface

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

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

Remarks: surface water approx 3' away

Photo 1. Wetland B: Looking north into ditch (03/14/12).

Photo 2. Wetland C: Looking south into wetland ditch (03/14/12).

Photo 3. Wetland D: Looking southwest from East Lake Sammamish Parkway toward the East Lake Sammamish Trail (03/14/12).

Photo 4. Wetland V: Looking north at wetland bench along the North Fork (04/19/12).

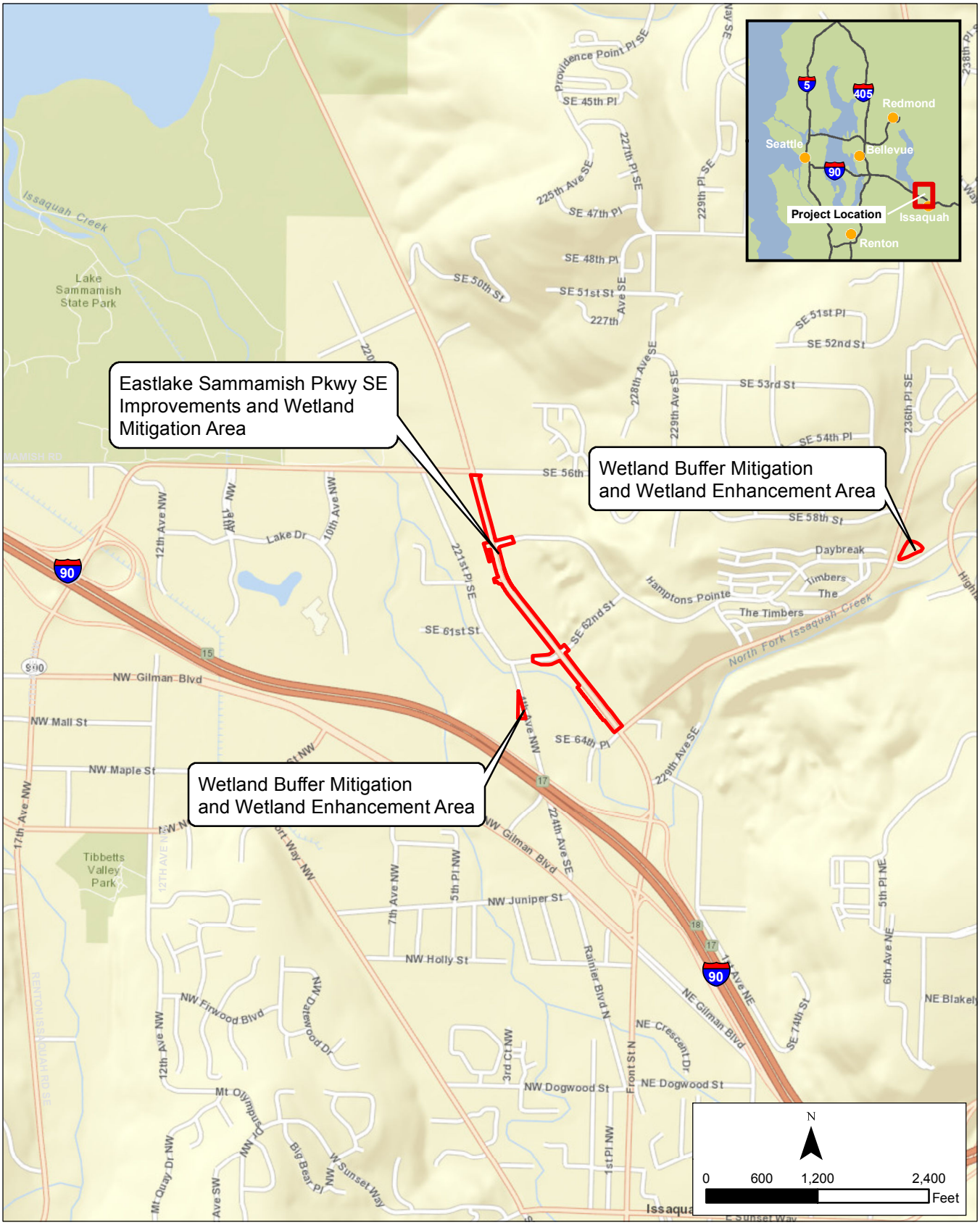
Photo 5. Wetland B Mitigation Area: Looking south along ditch at proposed wetland enhancement (02/26/14).

Photo 6. Wetland B Mitigation Area: ESA biologist inspecting proposed wetland B creation and buffer enhancement areas (02/26/14).

Photo 7. Wetland D Mitigation Area: Looking south at proposed wetland creation area on the north side of Wetland D(02/26/14).

Photo 8. 4th Ave NW Mitigation Area: Looking north at proposed mitigation area. Currently a gravel lot. (02/26/14).

Photo 9. 4th Ave NW Mitigation Area: Looking south along edge of Wetland T – Darst Park wetland (02/26/14).

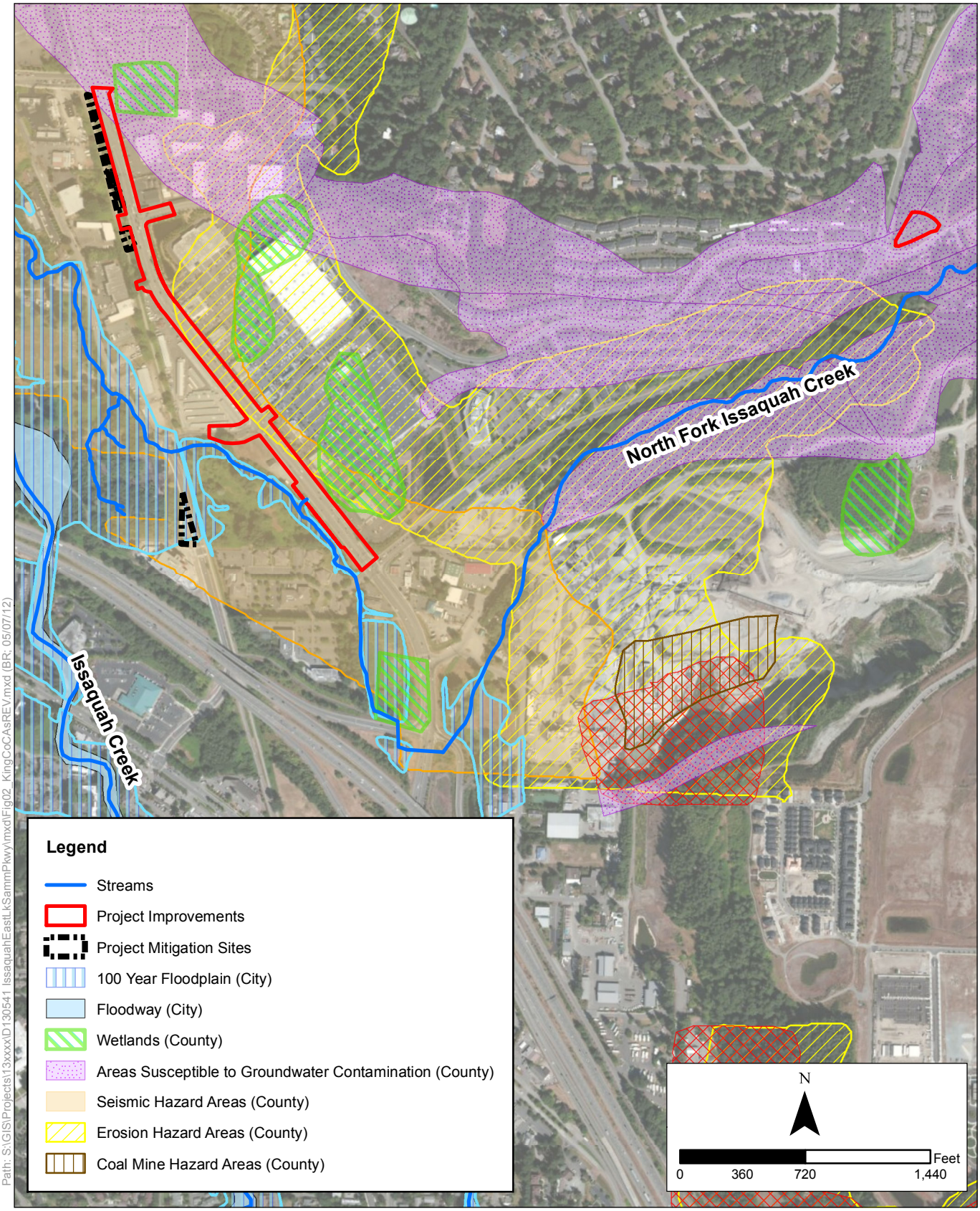


Document Path: S:\GIS\Projects\13xxxx\D130541 IssaquahEastLkSammPkwy\mxd\Fig01_Vicinity_Critical Area Study.mxd

SOURCE: King County, 2010; ESRI et al., 2013 (Street Map)

East Lake Sammamish Pkwy . 130541

Figure 1
Vicinity Map
Issaquah, WA

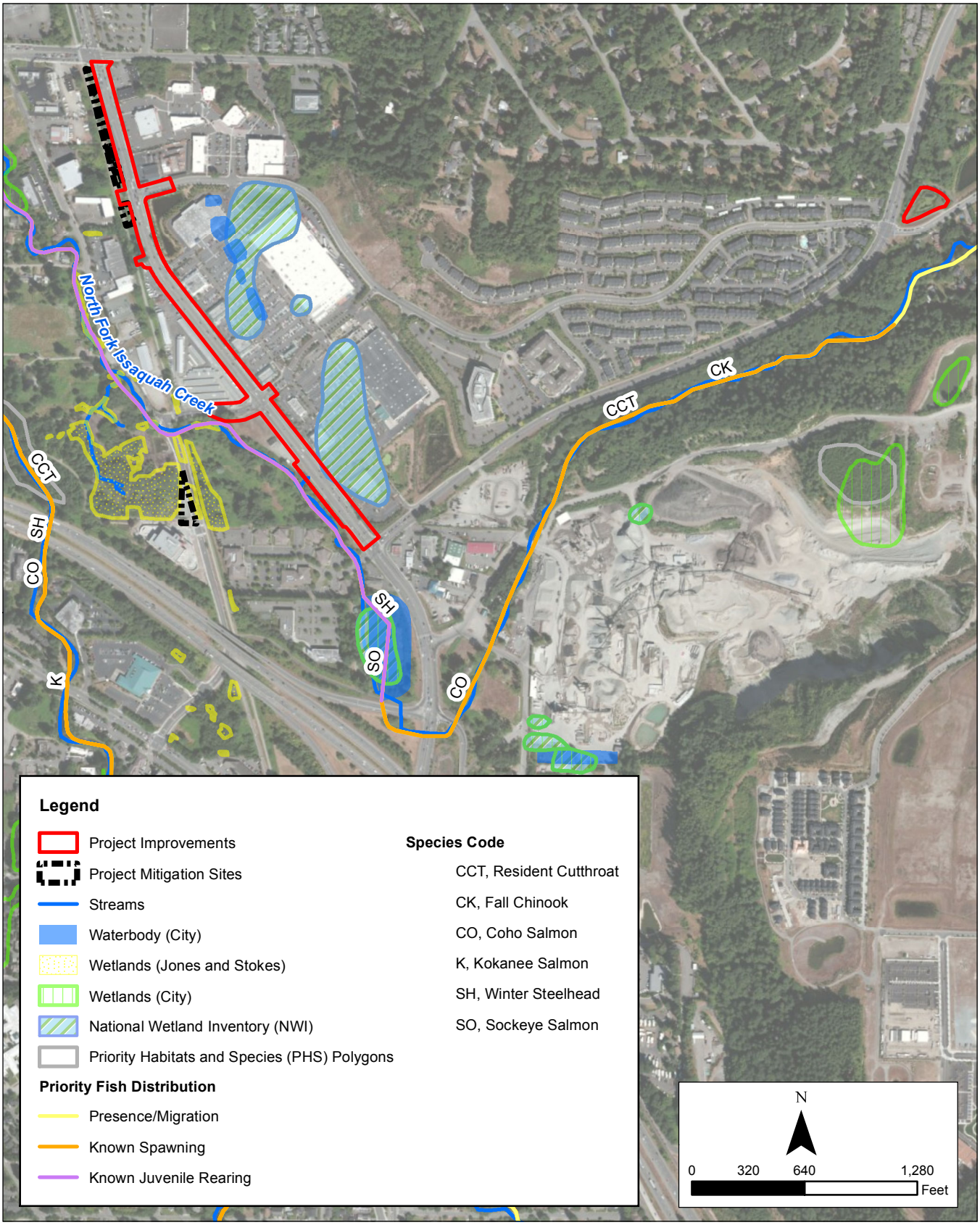


SOURCE: King County, 2009 (Critical Areas); City, 2010 (Floodplain); Bing 2011 (Aerial).

East Lake Sammamish Pkwy . 130541

Figure 2

Critical Areas Map
King County Inventory
City of Issaquah, Washington



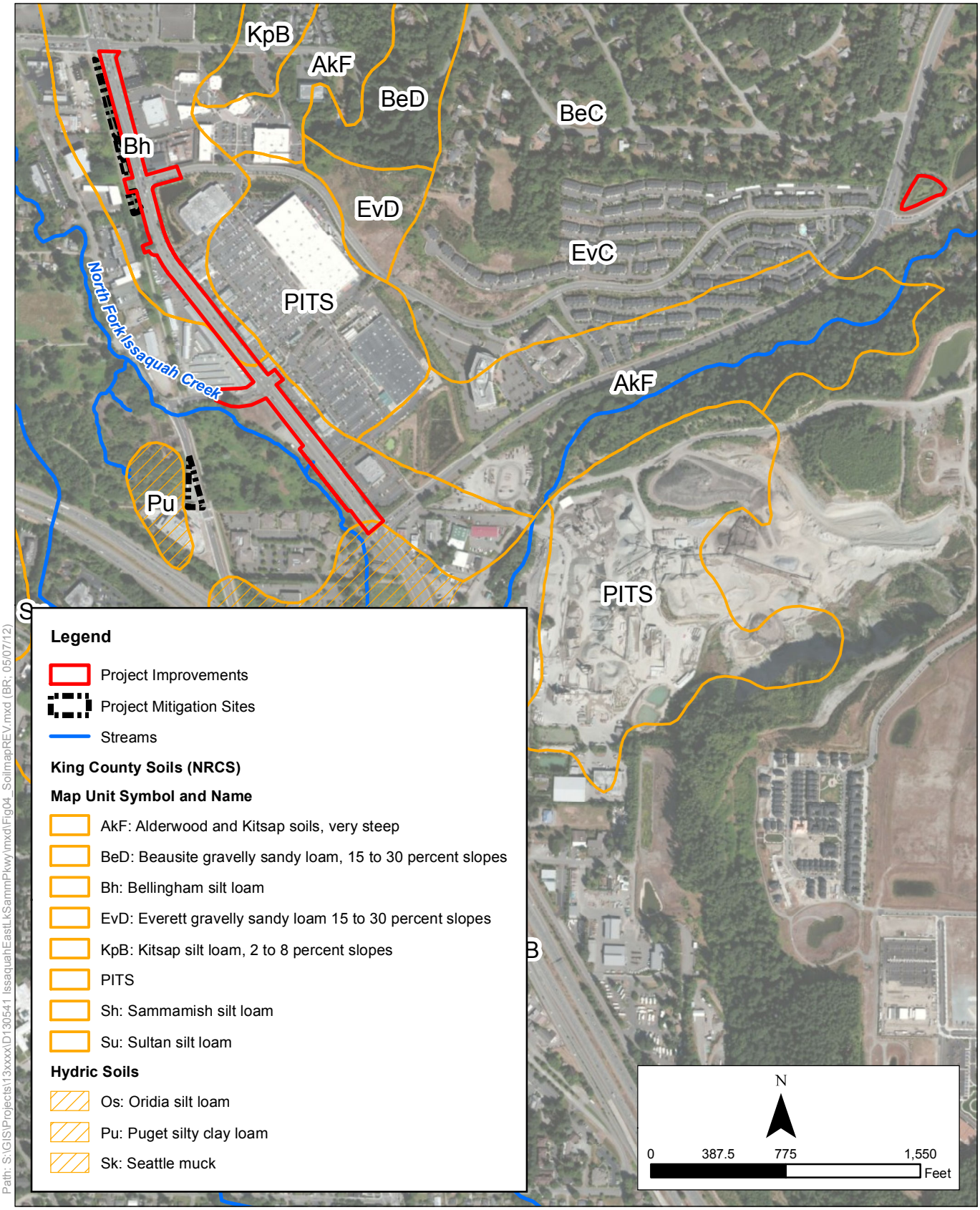
Path: S:\GIS\Projects\13xxxx\D130541 IssaquahEastLkSammPkwy\mxd\Fig03_PHSmapREV.mxd (BR; 05/07/12)

SOURCE: King County, 2009 (Wetlands and Streams); City of Issaquah (Wetlands); Jones and Stokes, 2005 (Wetlands); WDFW, 2010 (PHS); Bing 2010 (Aerial).

East Lake Sammamish Pkwy . 130541

Figure 3

Critical Areas Map
Priority Habitats and Species
City of Issaquah, Washington



SOURCE: NRCS, 2003 (Soils); City of Issaquah (City), 2010 (Streams); Bing, 2010 (Aerial).

East Lake Sammamish Pkwy . 130541

Figure 4

Soils Map

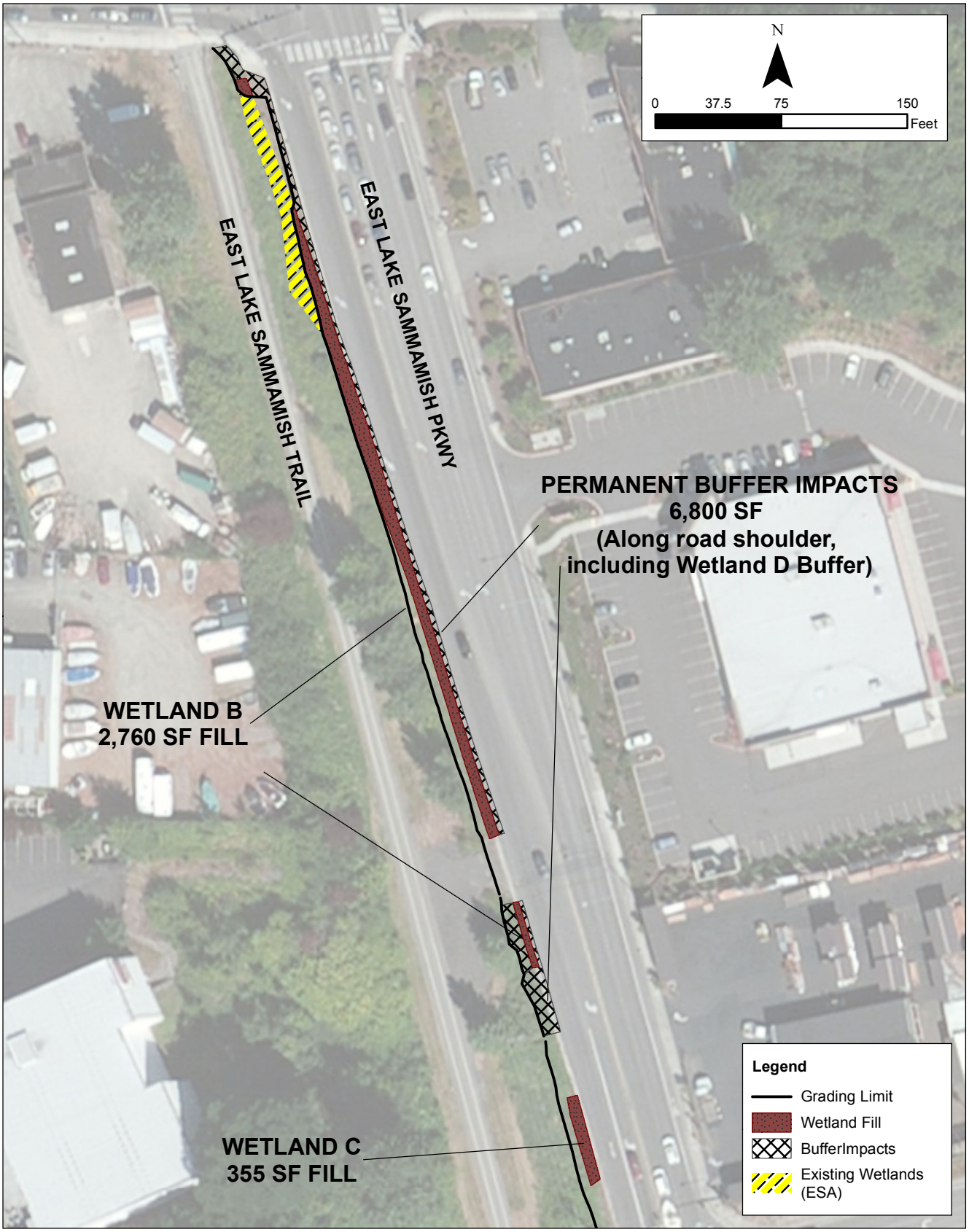
Issaquah, Washington

SOURCE: King County, 2010; Microsoft Bing, 2011 (Aerial)
ESA, 2012(Wetlands); Jones and Stokes, 2005 (Wetlands)

East Lake Sammamish Pkwy . 130541

Figure 5

Wetlands in the Project Corridor
Issaquah, WA



S:\GIS\Projects\13xxxx\D130541 IssaquahEastLkSammPkwy\mxd\Fig06_ImpactsBandC.mxd (brylander, 3/28/2014)

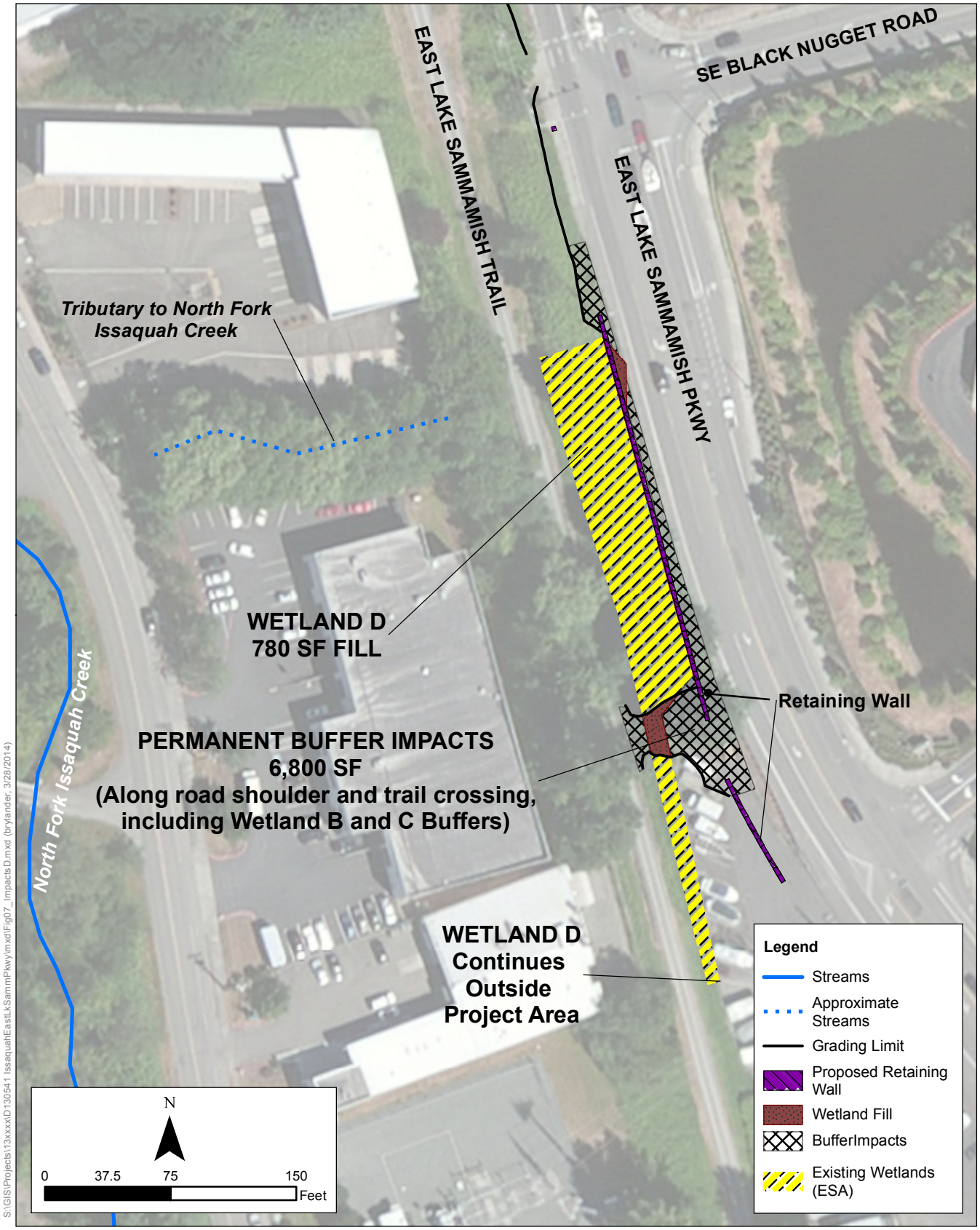
SOURCE: King County, 2010; ESA, 2012 (Wetlands); Microsoft Bing, 2011 (Aerial)

East Lake Sammamish Pkwy . 130541

Figure 6

Wetland B and C Impact Map

Issaquah, WA



SOURCE: King County, 2010; Microsoft Bing, 2011 (Aerial)

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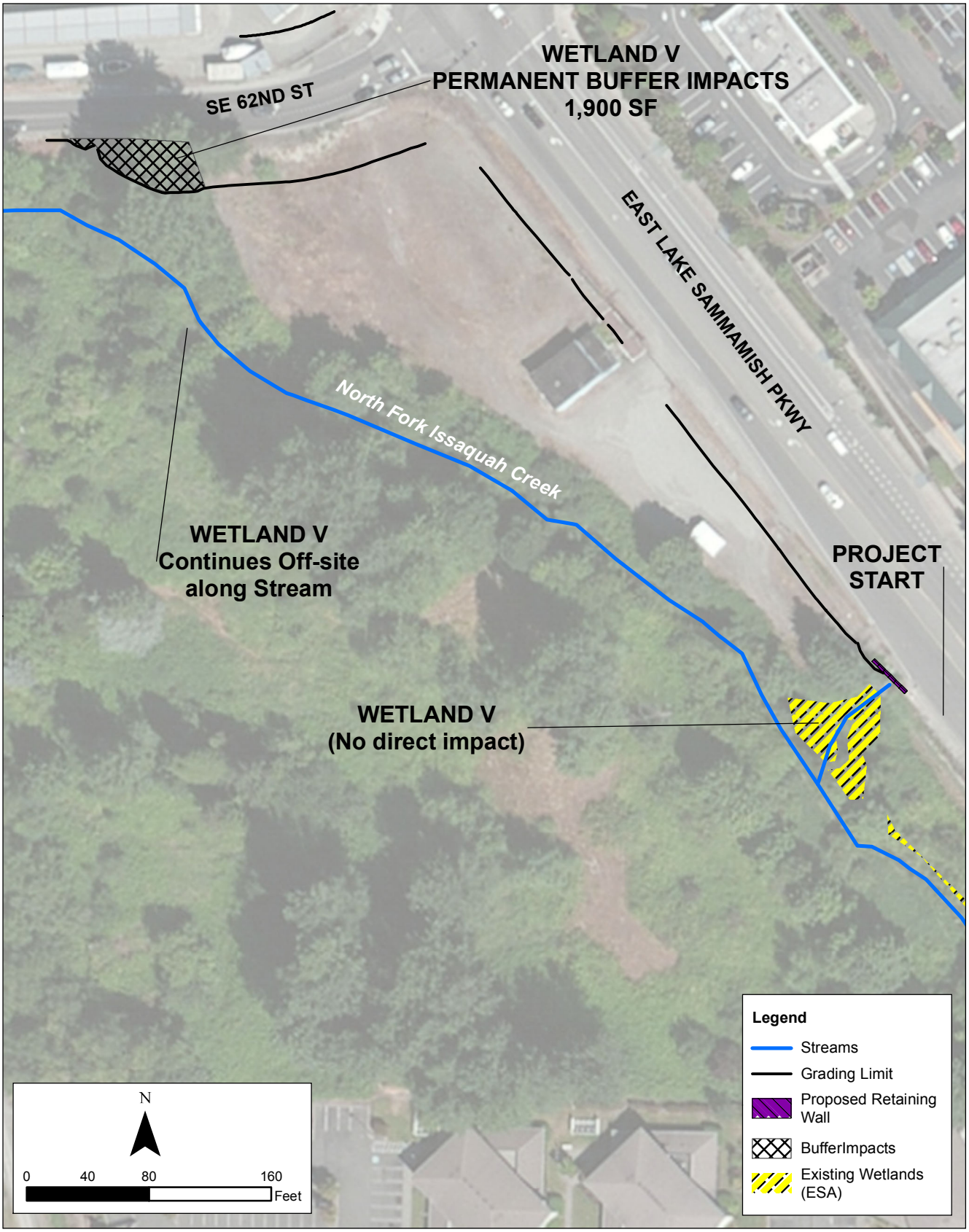
Figure 7

Wetland D Impact Map

Issaquah, WA

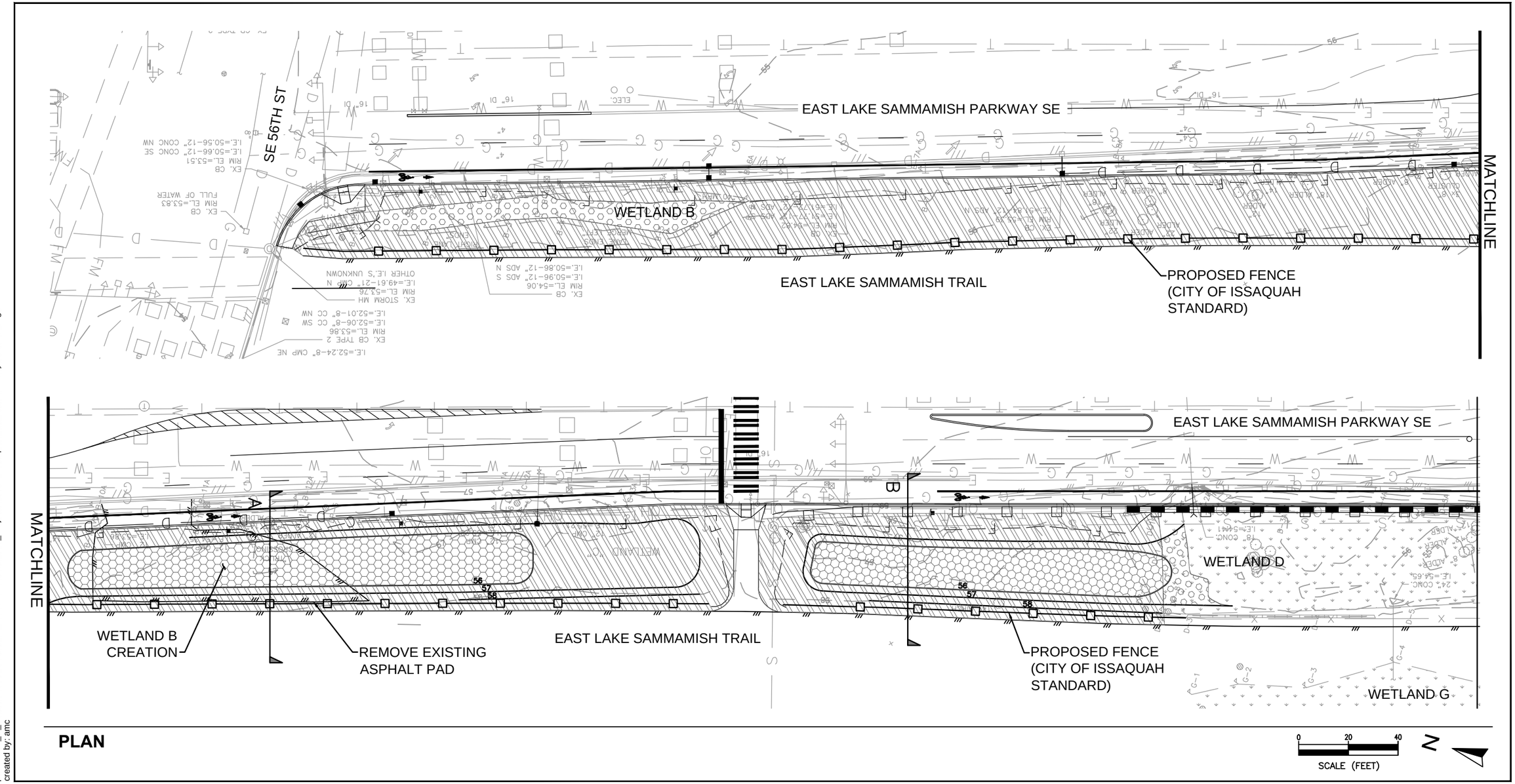


SOURCE: King County, 2010; Microsoft Bing, 2011 (Aerial)

East Lake Sammamish Pkwy . 130541

Figure 8

Wetland D Buffer Impact Map
Issaquah, WA



path: \\esa_sf_2k\esa\PROJECTS\SEA\ENVIR IMPACTS\2013_Projects\130541 IssaquahEastLKSammPkwy\08 CAD\Dwgs
created by: amc

SOURCE: Survey (Gray & Osborn, Inc., 2009, 2013, 2014); ESA, 2014

LEGEND

- WETLAND CREATION (PACIFIC WILLOW, SWAMP ROSE, SLOUGH SEDGE) - 5,843 SF
- WETLAND ENHANCEMENT (PACIFIC WILLOW, SWAMP ROSE, SLOUGH SEDGE) - 1,693 SF
- BUFFER/UPLAND ENHANCEMENT (WESTERN HAZEL, SNOWBERRY, OREGON GRAPE, COASTAL STRAWBERRY) - 19,177 SF

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FIGURE 9

Wetland B & D Mitigation Concept Plan

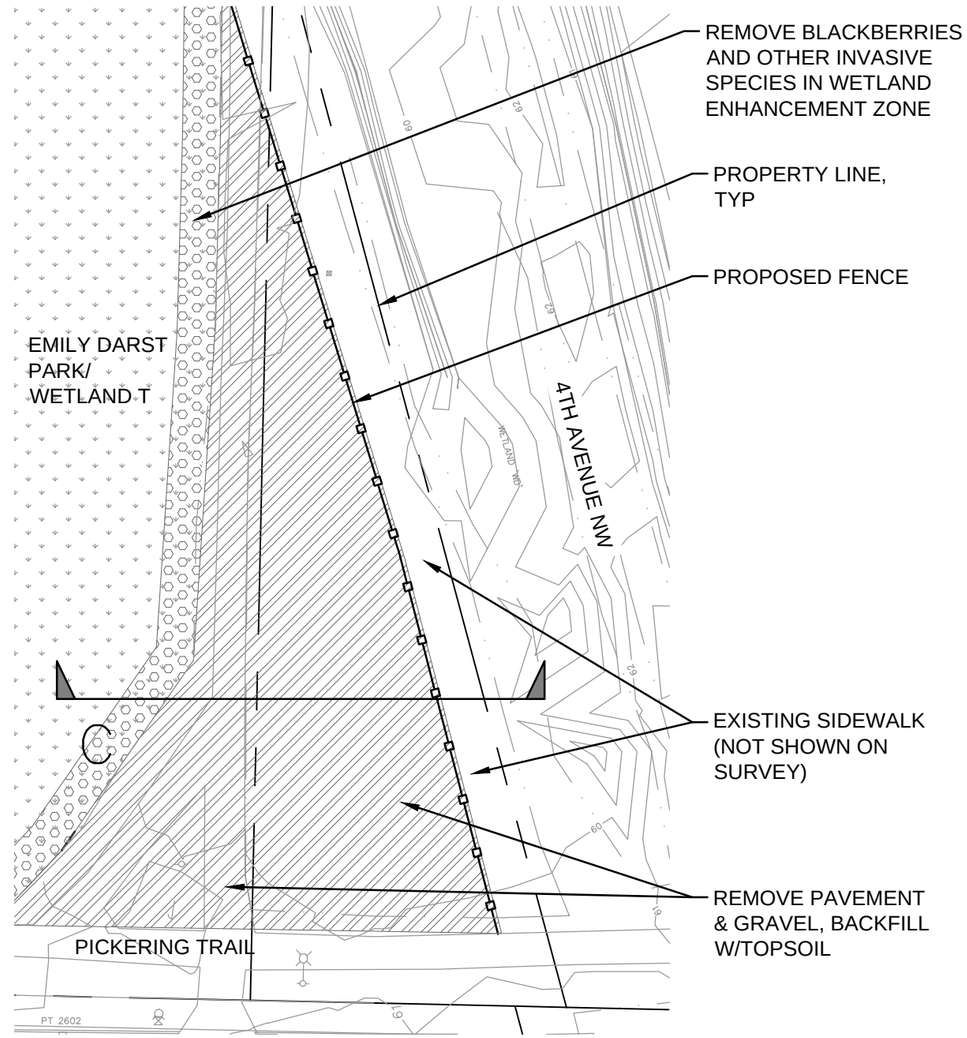
East Lake Sammamish Parkway SE
Issaquah, Washington

NOT FOR CONSTRUCTION

LEGEND

WETLAND ENHANCEMENT (PACIFIC WILLOW, SWAMP ROSE, SLOUGH SEDGE) - 2,600 SF

BUFFER/UPLAND ENHANCEMENT (DOUGLAS FIR, WESTERN HAZEL, SNOWBERRY, OREGON GRAPE, COASTAL STRAWBERRY) - 12,480 SF



PLAN

NOTE: SURVEY WAS COMPLETED IN 2009, PRIOR TO 4TH AVE NW IMPROVEMENTS

0 20 40
SCALE (FEET)

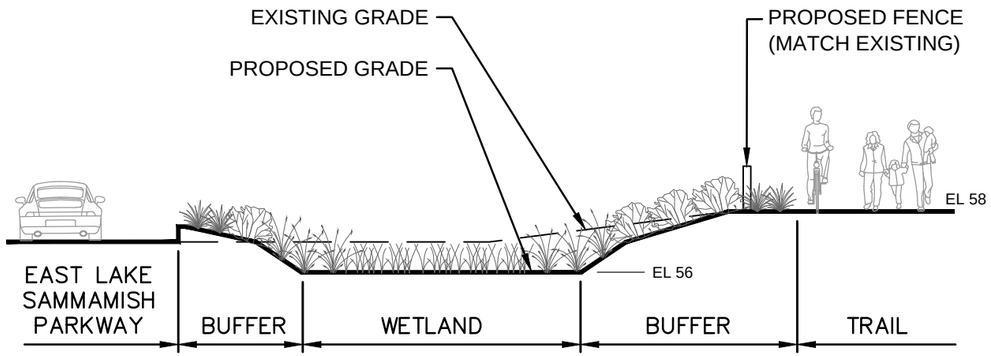
N

path: \\esa_sf_2k\esa\PROJECTS\SEA\ENVIR IMPACTS\2013_Projects\130541 IssaquahEastLkSammPkwy\08 CAD\Dwgs
created by: amc

SOURCE: Survey (Gray & Osborn, Inc., 2009, 2013, 2014); ESA, 2014

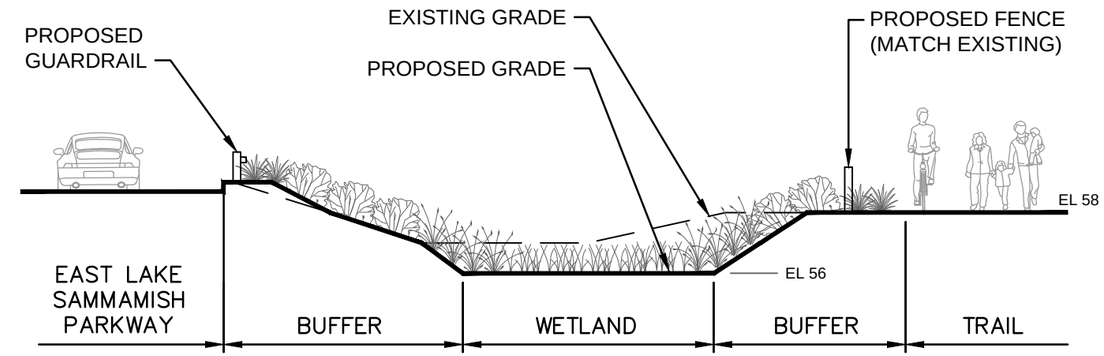
East Lake Sammamish Parkway SE Improvements . 130541

FIGURE 10
4TH AVE NW Mitigation Concept
East Lake Sammamish Parkway SE
Issaquah, Washington
NOT FOR CONSTRUCTION



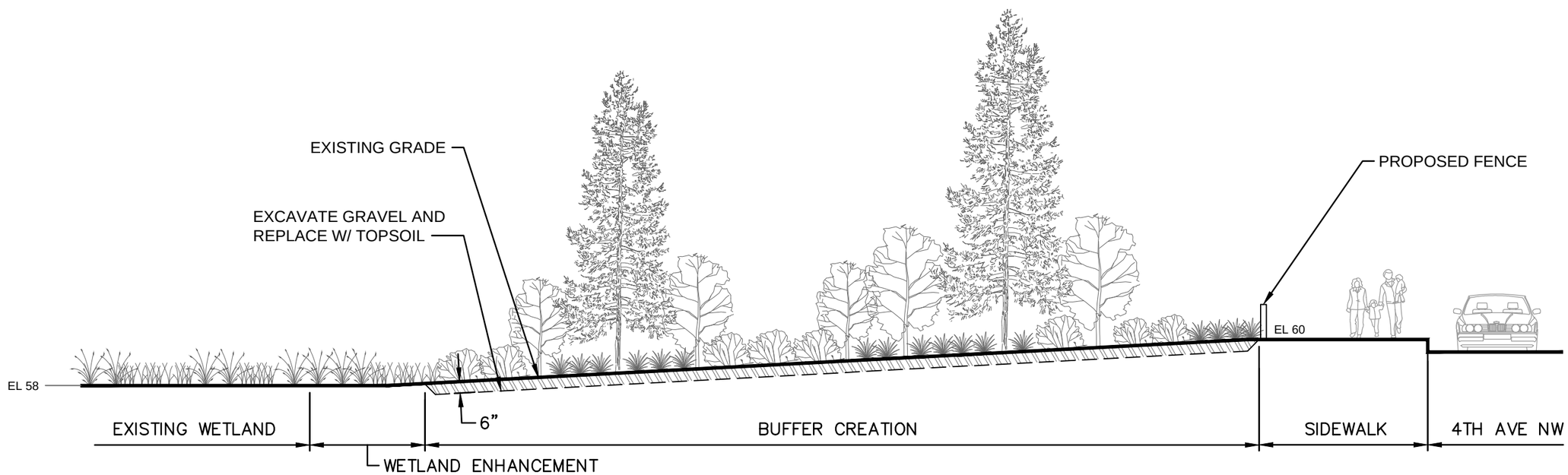
SECTION A - WETLAND CREATION (WETLAND B)

SCALE: 1"=10' (H), 1" = 5' (V)



SECTION B - WETLAND CREATION (WETLAND D)

SCALE: 1"=10' (H), 1" = 5' (V)



SECTION C - 4TH AVE NW BUFFER CREATION (WETLAND T)

SCALE: 1"=10' (H), 1" = 5' (V)

path: \\esa_sf_2k\esa\PROJECTS\SEA\ENVIR IMPACTS\2013_Projects\130541 IssaquahEastLkSammPkwy\08 CAD\Dwgs
created by: amc

SOURCE: Survey (Gray & Osborn, Inc., 2009, 2013, 2014); ESA, 2014

East Lake Sammamish Parkway SE Improvements . 130541

FIGURE 11
Mitigation Concept Cross Sections
East Lake Sammamish Parkway SE & 4th Avenue NW
Issaquah, Washington

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