

Revised Critical Areas Study East Lake Sammamish Master Plan Trail - North Sammamish Segment

Prepared for



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CITATION

King County. 2013. Revised Critical Areas Study
East Lake Sammamish Master Plan Trail - North
Sammamish Segment. Prepared by Parametrix,
Bellevue, Washington. July 2013.

TABLE OF CONTENTS

1. INTRODUCTION	1-1
1.1 PROJECT OVERVIEW	1-1
1.2 PURPOSE OF REPORT	1-2
1.3 PROJECT AREA.....	1-2
2. METHODS.....	2-1
2.1 REVIEW OF EXISTING LITERATURE.....	2-1
2.2 FIELD INVESTIGATION	2-1
2.3 WETLAND IDENTIFICATION.....	2-2
2.3.1 Vegetation	2-2
2.3.2 Soils.....	2-3
2.3.3 Hydrology.....	2-3
2.4 WETLAND CLASSIFICATION AND RATING.....	2-3
2.5 WETLAND FUNCTIONS	2-4
2.6 STREAM IDENTIFICATION AND CLASSIFICATION	2-4
2.7 LAKE SAMMAMISH.....	2-5
2.8 FISH AND WILDLIFE HABITAT CONSERVATION AREAS.....	2-5
2.9 CRITICAL AQUIFER RECHARGE AREAS	2-5
2.10 IMPACT ASSESSMENT	2-6
3. RESULTS.....	3-1
3.1 LANDSCAPE SETTING	3-1
3.2 WETLANDS	3-2
3.3 STREAMS	3-30
3.4 LAKE SAMMAMISH.....	3-30
3.5 FISH AND WILDLIFE HABITAT CONSERVATION AREAS.....	3-31
3.6 CRITICAL AQUIFER RECHARGE AREAS	3-31
4. IMPACT ASSESSMENT.....	4-1
4.1 WETLANDS	4-1
4.1.1 Temporary Wetland Impacts	4-1
4.1.2 Permanent Wetland Buffer Impacts	4-2
4.1.3 Temporary Wetland Buffer Impacts.....	4-2
4.2 STREAMS	4-2
4.2.1 Stream Channel Impacts.....	4-3
4.2.2 Permanent Stream Buffer Impacts.....	4-6
4.2.3 Temporary Stream Buffer Impacts.....	4-7
4.3 LAKE SAMMAMISH.....	4-7
4.3.1 Shoreline Setback Impacts	4-7
4.4 CRITICAL AQUIFER RECHARGE AREAS	4-7

TABLE OF CONTENTS (CONTINUED)

5. MITIGATION APPROACH	5-1
5.1 AVOIDANCE AND MINIMIZATION	5-1
5.2 RESTORATION OF TEMPORARY IMPACTS.....	5-2
5.3 COMPENSATORY MITIGATION	5-2
5.3.1 Streams	5-2
5.3.2 Wetland Buffers, Stream Buffers, and Shoreline Setback.....	5-2
5.3.3 Mitigation Goals, Objectives, and Performance Standards.....	5-4
6. MONITORING AND MAINTENANCE.....	6-1
6.1 MONITORING.....	6-1
6.1.1 Quantitative Monitoring	6-1
6.1.2 Qualitative Monitoring	6-1
6.2 MAINTENANCE	6-2
6.3 CONTINGENCY MEASURES	6-2
7. REFERENCES	7-1

LIST OF FIGURES

1-1 Site Location Map	1-3
3-1 Drainage Basins, Subbasins and Site Characteristics.....	3-3
3-2a. Critical Areas Map.....	3-5
3-2b. Critical Areas Map.....	3-7
3-2c. Critical Areas Map.....	3-9
3-2d. Critical Areas Map.....	3-11
3-2e. Critical Areas Map.....	3-13

LIST OF TABLES

2-1 Key to Plant Indicator Status Categories.....	2-2
2-2 Wetland Functions and Values Assessed	2-4
3-1 Summary of Wetlands in the Project Vicinity.....	3-2
3-2 Summary of Wetland Functions and Values for Wetlands in the Project Area Identified by Parametrix ^a	3-15
3-3 Summary of Streams Crossing the Project Area	3-30
4-1 Summary of Impacts on Wetlands and Buffers.....	4-1
4-2 Summary of Impacts on Stream Channels and Buffers.....	4-4
6-1 Contingency Measures for the Mitigation Sites	6-2

TABLE OF CONTENTS (CONTINUED)

APPENDICES

- A Wetland Determination Data Forms
- B Wetland Rating Forms
- C Wetland Functions and Values Forms
- D Critical Area Impact Figures
- E Critical Area Mitigation

ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
ADS	Advanced Drainage Systems
BMP	best management practice
BNSF	Burlington Northern Santa Fe
CARAs	critical aquifer recharge areas
CAS	Critical Areas Study
cfs	cubic feet per second
CMP	corrugated metal pipe
DPER	King County Department of Permitting and Environmental Review
Ecology	Washington State Department of Ecology
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FWHCA	fish and wildlife habitat conservation area
HGM	hydrogeomorphic (classification)
LWD	large woody debris
Master Plan Trail	East Lake Sammamish Master Plan Trail
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
SMC	Sammamish Municipal Code
SMP	Shoreline Master Program
TESC	temporary erosion and sedimentation control
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1. INTRODUCTION

1.1 PROJECT OVERVIEW

King County is proposing to develop the East Lake Sammamish Master Plan Trail (Master Plan Trail)—a 10.33-mile regional multi-user trail and nonmotorized, alternative transportation corridor located near the eastern shore of Lake Sammamish. The entire project site is located along the existing Interim Use Trail in the King County right-of-way that extends from Gilman Boulevard in Issaquah to Bear Creek in Redmond. The Interim Use Trail is located on the alignment of the former Burlington Northern Santa Fe (BNSF) railroad that began operations in 1855 and ceased operations along this corridor in 1996. King County acquired the rail-banked corridor in 1998 and completed construction of the Interim Use Trail in 2006.

Proposed improvements of the Master Plan Trail will be constructed in multiple segments—Redmond, Issaquah, North Sammamish, and South Sammamish. The Redmond Segment of the trail was constructed in 2011 and the Issaquah Segment will be constructed during 2012. The North Sammamish Segment of the proposed trail is the focus of this report, scheduled for construction in 2013. This trail segment is approximately 2.4 miles, extending from Kokomo Drive north to the city’s north boundary near 187th Avenue NE (Figure 1-1).

An existing gravel trail (i.e., the Interim Use Trail) is located in the project corridor. The Master Plan Trail will be the “full” buildout of the trail and will replace the existing soft-surface Interim Use Trail along a similar alignment. The Interim Use Trail is typically 8 to 12 feet wide and will be widened to accommodate the Master Plan Trail, which is typically 12 feet of pavement bounded by two 2-foot-wide shoulders and 1-foot-wide clear zones, in accordance with American Association of State Highway and Transportation Officials (AASHTO) guidelines. The project will include:

- Construction of a 12-foot-wide paved regional trail with soft-surface (gravel) shoulders;
- Related earthwork;
- Drainage improvements related to the trail;
- Culvert replacements to improve fish passage;
- Retaining walls and other site improvements;
- Landscaping and fencing; and
- Access and traffic control (bollards, striping, signage, etc.).

The Master Plan Trail will provide a paved multi-use trail for bicyclists, pedestrians, and others between cities within the Urban Growth Area—Issaquah, Sammamish, and Redmond. The trail will provide an off-road facility and route as a nonmotorized alternative to surrounding congested arterials. As a result, the project will promote nonmotorized access to employment, retail, and recreation centers within the city of Sammamish as well as provide a regional link with Redmond, Issaquah, and other cities and regional growth centers as an important component of the Regional Trails System.

The North Sammamish Segment of the Master Plan Trail is part of the expanding Regional Trails System that provides a network of off-road, multi-use, nonmotorized transportation facilities used by thousands of bicyclists, pedestrians, and others daily for commuting to work or school, local travel, and recreation. The existing Regional Trails System now comprises approximately 300 miles of alternative transportation corridors. The Master Plan Trail is

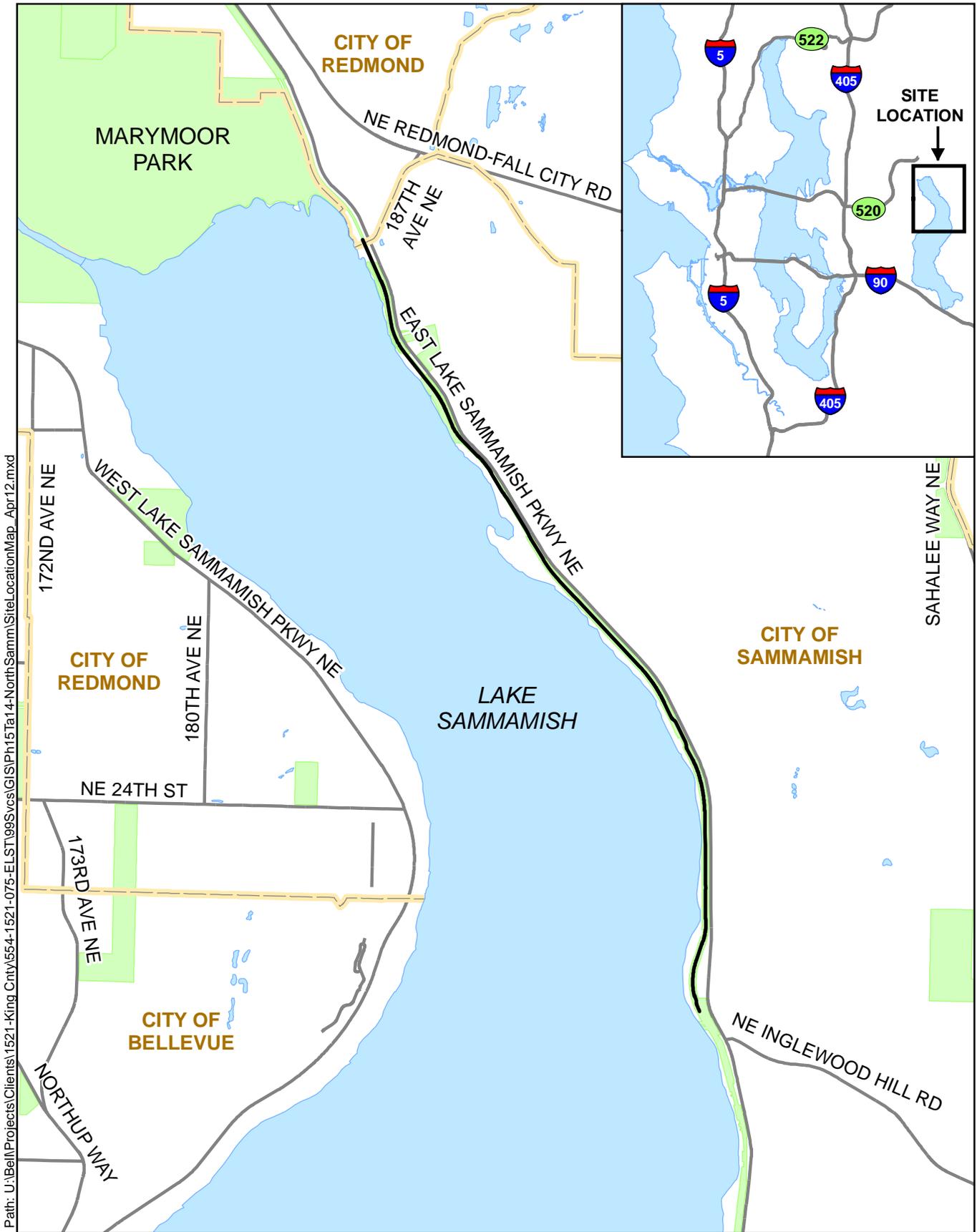
among the most significant of these due to its strategic location within King County, its length, and its connections via urban centers, city centers, and many land uses (residential, commercial, retail, professional, institutional, government, historic districts, and recreation areas). The Master Plan Trail extends the Burke-Gilman and Sammamish River Trails to create a 42-mile regional alternative transportation corridor stretching from Seattle to Issaquah and beyond to the Cascades. This project is an important part of that extension. The North Sammamish Segment will provide many direct local benefits, including a connection to the new Sammamish Landing Park. The Master Plan Trail also will link with other regional trails.

1.2 PURPOSE OF REPORT

According to the City of Sammamish Environmentally Critical Areas Regulations, an applicant for a development proposal shall submit a Critical Areas Study (CAS) where the following conditions apply: alteration of a wetland, stream, fish and wildlife habitat conservation area (FWHCA), critical aquifer recharge areas (CARAs), frequently flooded areas, or modification or reduction of a buffer (Sammamish Municipal Code [SMC] 21A.50.120). This CAS has been prepared to satisfy these City of Sammamish requirements by describing wetlands, streams, FWHCAs, and CARAs evaluating potential impacts on these critical areas from the proposed trail; and presenting mitigation for these impacts. This project does not occur within any frequently flooded areas. Other critical areas regulated by the City of Sammamish, such as landslide hazard areas or erosion and seismic hazard areas, are not addressed in this CAS. Information presented herein is intended to facilitate environmental review and permitting.

1.3 PROJECT AREA

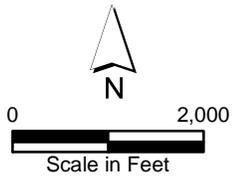
The project area is a linear corridor in the King County right-of-way along the eastern shore of Lake Sammamish within the city of Sammamish that closely parallels East Lake Sammamish Parkway NE (to the east), between Kokomo Drive and the city's north boundary near 187th Avenue NE. The right-of-way varies from 50 to 100 feet in width along the trail. The North Sammamish Segment is located in Sections 18, 19, 20, and 29, Township 25 North, Range 6 East. The project corridor is a former railroad right-of-way, surrounded by single-family residential land use. The project area includes 15 wetlands (including 4 outside of the trail right-of-way) and 15 streams.



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Parametrix

Sources: King County, WSDOT.



— Project Site

Figure 1-1
Site Location Map
East Lake Sammamish Trail

2. METHODS

This report is based on a review of existing information and field investigations. The goal of these efforts is to collect and document existing information that reflects current site conditions for assessing potential impacts.

2.1 REVIEW OF EXISTING LITERATURE

Prior to conducting fieldwork, and throughout the duration of project design, biologists reviewed existing information to identify wetlands, streams, vegetation patterns, topography, soils, wildlife habitats, and other natural resources in the project area. Existing data sources that were reviewed for this report included but were not limited to the following:

- City of Sammamish critical area maps
- Natural Resources Conservation Service (NRCS) Soil Survey of King County Area, Washington (Snyder et al.1973)
- National Wetlands Inventory (NWI), online wetlands mapper (USFWS 2012)
- A Catalog of Washington Streams and Salmon Utilization, Volume 1, Puget Sound Region (Williams et al. 1975)
- SalmonScape online mapping tool (WDFW 2012a)
- Final East Lake Sammamish Basin and Nonpoint Action Plan (King County 1994)
- Salmon and Steelhead Habitat Limiting Factors Report for the Cedar-Sammamish Basin (Kerwin 2001)
- Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008)
- East Lake Sammamish Master Plan Trail Fish and Fish Habitat Technical Report (Parametrix 2006)
- East Lake Sammamish Master Plan Trail Wetland Biology Discipline Report (Parametrix 2005)
- Online Priority and Habitat Species listed by the Washington Department of Fish and Wildlife (WDFW 2012b)
- List of Sections that Contain Natural Heritage Features (Washington State Department of Natural Resources [WDNR] 2011)
- Draft Biological Assessment for the East Lake Sammamish Trail Master Plan (Parametrix 2007).
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) and Flood Insurance Studies

2.2 FIELD INVESTIGATION

Wetland and stream field investigations were initially conducted in 1999 and 2000. Since it has been longer than 5 years, project biologists re-delineated wetlands and streams in November and December 2007, and January, March, and April 2008 to identify and document current resource conditions in the project corridor. Areas were re-evaluated in 2011

and 2012 to update any areas where changes may have occurred due to recent development or natural conditions in the project vicinity since 2008.

2.3 WETLAND IDENTIFICATION

Biologists delineated wetlands according to the methods specified in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987). These methods comply with those in the Washington State Wetland Identification and Delineation Manual (Washington State Department of Ecology [Ecology] 1997).

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar areas. An area must have at least one positive indicator of wetland vegetation, soils, and hydrology to be considered a wetland. The delineated wetlands were instrument-surveyed by professional land surveyors. Field data sheets were recorded for each wetland (Appendix A).

This report also incorporates some of the wetlands delineated by Anchor Environmental, LLC for the Sammamish Landing Park project (Anchor Environmental, LLC 2008). On June 14, 2012, the project biologist met with Laura Casey from King County Department of Permitting and Environmental Review (DPER) to review the Sammamish Landing Park wetlands that were delineated within the trail right-of-way. It was determined that not all of these areas met the wetland criteria. This CAS incorporates wetlands delineated outside of the right-of-way and those areas designated as wetland based on the June 13, 2012 field meeting with King County DPER (Wetlands A, B, C, D, E, and I).

2.3.1 Vegetation

The dominant plants and their wetland indicator status were evaluated to determine whether the vegetation is hydrophytic. Hydrophytic vegetation is generally defined as vegetation adapted to prolonged saturated soil conditions. To meet the hydrophytic vegetation criterion, more than 50 percent of the dominant plants must be facultative, facultative wetland, or obligate, according to the plant indicator status category assigned to each plant species by the U.S. Fish and Wildlife Service (USFWS) (Reed 1988, 1993). Table 2-1 provides the definitions of the indicator status categories.

Table 2-1. Key to Plant Indicator Status Categories

Plant Indicator Status Category	Symbol	Definition
Obligate Wetland Plants	OBL	Plants that almost always (>99% of the time) occur in wetlands but may rarely (<1% of the time) occur in non-wetlands
Facultative Wetland Plants	FACW	Plants that often (67% to 99% of the time) occur in wetlands but sometimes (1% to 33% of the time) occur in non-wetlands
Facultative Plants	FAC	Plants with a similar likelihood (33% to 66% of the time) of occurring in both wetlands and non-wetlands
Facultative Upland Plants	FACU	Plants that sometimes (1% to 33% of the time) occur in wetlands but occur more often (67% to 99% of the time) in non-wetlands
Upland Plants	UPL	Plants that rarely (<1% of the time) occur in wetlands and almost always (> 99% of the time) occur in non-wetlands

Source: Environmental Laboratory (1987).

The scientific and common names for plants follow the currently accepted nomenclature. Most of the names are consistent with Plants of the Pacific Northwest Coast (Pojar and MacKinnon 1994) and the PLANTS Database (USDA, NRCS 2012a). During the field investigations by project biologists, dominant plant species were observed and recorded on field data sheets for each data plot (Appendix A).

2.3.2 Soils

Generally, an area must have hydric soils to be considered a wetland. Hydric soil forms when soils are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper portion. Biological activities in saturated soil result in reduced concentrations of oxygen that in turn result in a preponderance of organisms that use anaerobic processes for metabolism. Over time, anaerobic biological processes result in certain soil color patterns, which are used as indicators of hydric soil. Typically, low-chroma colors are formed in the matrix of hydric soil. Bright-colored redoximorphic features form within the matrix under a fluctuating water table. Other important hydric soil indicators include organic matter accumulations in the surface horizon, reduced sulfur odors, and organic matter staining in the subsurface. Soils were examined by excavating sample pits to a depth of 18 inches or more to observe the soil profiles, colors, and textures. Munsell color charts (Gretag Macbeth 2000) were used to describe the soil colors.

2.3.3 Hydrology

The project area was examined for evidence of hydrology. An area is considered to have wetland hydrology when soils are ponded or saturated consecutively 12.5 percent of the growing season. In King County (Landsburg area), the growing season generally lasts from the end of March (March 24) to mid-November (November 11) for a total of 232 days (USDA, NRCS 2010b), so ponding or saturation must be present for approximately 29 consecutive days. Primary indicators of hydrology include surface inundation and saturated soils. Secondary indicators of hydrology include drainage patterns, watermarks on vegetation, water-stained leaves, and oxidized root channels.

2.4 WETLAND CLASSIFICATION AND RATING

Delineated wetlands were classified according to the USFWS Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). In accordance with SMC 21A.15.1415, wetlands were rated using the revised Washington State Wetland Rating System for Western Washington (Hruby 2004) (Appendix B). Hydrogeomorphic classifications were assigned to wetlands using USACE methods established in a Hydrogeomorphic Classification System for Wetlands (Brinson 1993).

The buffer widths for the wetlands in the project area are those required by the City of Sammamish (SMC 21A.50.290). However, where a legally established and constructed street crosses a wetland buffer, the City may approve a modification of the standard buffer width to the edge of the street under certain conditions. These conditions are if the isolated part of the buffer does not provide additional protection of the wetland but instead has insignificant biological, geological, or hydrological buffer functions related to the wetland. Based on City code interpretation used for a separate project, the East Lake Sammamish Trail is consistent with this street definition. During the impact analysis, impacts on wetland buffers across the trail were evaluated. If the isolated portion of the buffer did not provide additional protection or functions, then it was excluded. These excluded areas typically are landscaped yards associated with residences, patches of invasive species, and low-growing grasses and forbs.

2.5 WETLAND FUNCTIONS

Functions of individual project area wetlands delineated by Parametrix were assessed using the Washington State Department of Transportation (WSDOT) Wetland Functions Characterization Tool for Linear Projects (Null et al. 2000). This is a qualitative tool designed for linear projects to enable the rapid documentation and characterization of functions and values of a particular wetland. This method allows evaluation of wetland functions using best professional judgment and readily observed environmental characteristics. For example, an area of permanent open water is characteristic of a wetland that provides habitat for waterfowl or aquatic animals. The upland habitats and buffers surrounding wetlands were also considered in the evaluation because adjacent land uses affect the performance of wetland functions. Biologists reviewed the indicator characteristics present for each affected wetland and assigned a summary rating of low, low-moderate, moderate, moderate-high, or high for each wetland function (Appendix C). Table 2-2 lists the wetland functions and values evaluated.

Table 2-2. Wetland Functions and Values Assessed

Flood Flow Alteration	Habitat for Amphibians
Sediment Removal	Habitat for Wetland-Associated Mammals
Nutrient and Toxicant Removal	Habitat for Wetland-Associated Birds
Erosion Control and Shoreline Stabilization	General Fish Habitat
Production of Organic Matter and its Export	Native Plant Richness
General Habitat Suitability	Educational or Scientific Value
Habitat for Aquatic Invertebrates	Uniqueness and Heritage

2.6 STREAM IDENTIFICATION AND CLASSIFICATION

Streams are defined as those areas in the city where surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or stormwater runoff conveyance devices, or other entirely artificial watercourses, unless they are used by salmonids or are used to convey streams naturally occurring prior to construction of such watercourses (SMC 21A.15.1240). For the purpose of this definition, a defined channel or bed is an area that 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. The ordinary high water mark (OHWM) of project area streams were identified and were instrument-surveyed by professional land surveyors. Stream data are based on the 2006 East Lake Sammamish Master Plan Trail Fish and Fish Habitat Technical Report (Parametrix 2006) and observations made during subsequent field investigations.

Streams were classified according to City of Sammamish regulations (SMC 21A.15.1240) and the Washington State water typing system. Stream type determinations were also informed by determinations of presumed fish use according to (Washington Administrative Code [WAC] 222-16-031). The types were applied to the stream reaches located within the project area. Buffer widths assigned to streams reflect standard buffer requirements in SMC 21A.50.330. Similar to wetland buffers, where a legally established and constructed street crosses a stream buffer, the City may approve a modification of the standard buffer width to the edge of the street under certain conditions. During the impact analysis, impacts on stream buffers across the trail were evaluated. If the isolated portion of the buffer did not provide additional protection or functions, then it was excluded. These excluded areas typically are

landscaped yards associated with residences, patches of invasive species, and low-growing grasses and forbs.

2.7 LAKE SAMMAMISH

The majority of the project area is within 200 feet of Lake Sammamish, placing it within the shoreline jurisdiction. The City of Sammamish Shoreline Master Program (SMP) provides the goals, policies, and regulations for use and development within the shoreline area. According to SMP 25.06.020(9), a 50-foot shoreline setback (extending from the OHWM) is established for Lake Sammamish.

The OHWM for Lake Sammamish was not field delineated for this project because it was outside of the trail right-of-way. Instead, the CAD files for the OHWM delineated for the Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008) was used for the north end, and King County 2010 open water GIS data were used for the remainder of the project area to determine the shoreline setback area.

2.8 FISH AND WILDLIFE HABITAT CONSERVATION AREAS

According to SMC 21A.15.468, the City of Sammamish defines FWHCAs as those areas that are essential for the preservation of critical habitat and species. All areas within the City of Sammamish meeting one or more of the following criteria are designated FWHCAs:

- (1) Areas with which state or federally designated endangered, threatened, and sensitive species have a primary association.
 - (a) Federally designated endangered and threatened species are those fish and wildlife species identified by the USFWS and the National Marine Fisheries Service (NMFS) that are in danger of extinction or are threatened to become endangered. The USFWS and the NMFS should be consulted as necessary for current listing status;
 - (b) State-designated endangered, threatened, and sensitive species are those fish and wildlife species native to the coastal region of the Pacific Northwest identified by the Washington Department of Fish and Wildlife (WDFW) that are in danger of extinction, threatened to become endangered, vulnerable, or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats. State-designated endangered, threatened, and sensitive species are periodically recorded in WAC 232-12-014 (state endangered species), and WAC 232-12-011 (state threatened and sensitive species). WDFW maintains the most current listing and should be consulted as necessary for current listing status;
- (2) Streams, lakes, and naturally occurring ponds;
- (3) State natural area preserves and natural resource conservation areas. Natural area preserves and natural resource conservation areas are defined, established, and managed by the WDNR; and
- (4) Wildlife habitat corridors for preserving connections between habitats along the designated wildlife habitat network.

2.9 CRITICAL AQUIFER RECHARGE AREAS

According to SMC 21A.15.253, the City of Sammamish defines CARAs as those areas with a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-030(2). CARAs have prevailing geologic conditions associated with infiltration rates that

create a high potential for contamination of groundwater resources or contribute significantly to the replenishment of groundwater. CARAs are classified based on the following criteria:

- (1) Class 1 CARAs include those areas located within the mapped 1- or 5-year capture zone of a wellhead protection area.
- (2) Class 2 CARAs include those areas located within the mapped 10-year capture zone of a wellhead protection area.
- (3) Class 3 CARAs include those areas outside wellhead protection areas that are identified as high aquifer recharge potential areas based on characteristics of surficial geology and soil types.

2.10 IMPACT ASSESSMENT

Impacts on wetlands, streams, and buffers (including shoreline setback) were assessed by overlaying the proposed design onto project base maps showing wetland, stream, and buffer locations. Impact areas were determined as the area of intersection between the proposed design and the base maps. This assessment also considered loss of wetland and stream function (based on the amount of clearing, filling, and/or excavation as a result of the project) and other direct and indirect impacts on wetlands and streams.

3. RESULTS

The following sections describe critical areas in the project limits. Also included are descriptions of individual wetlands, streams, and FWHCAs identified in the project area.

3.1 LANDSCAPE SETTING

This trail project alignment roughly parallels the eastern shoreline of Lake Sammamish (to the west) and East Lake Sammamish Parkway (to the east) in the East Lake Sammamish Basin, which is in the Upper Sammamish River Drainage in the Cedar/Sammamish Watershed (Water Resource Inventory Area [WRIA] 8) (Williams et al. 1975; Ecology 2008). Streams in the East Lake Sammamish Basin generally originate in wetlands located on the Sammamish Plateau, and drain west through steep ravines to Lake Sammamish. This basin is further divided into several small subbasins. The North Sammamish Segment is within the Panhandle subbasin.

The Panhandle subbasin is approximately 3 miles long and relatively narrow (Figure 3-1). The subbasin is drained by perennial and intermittent streams, including numerous seeps, which are characteristically short, high-gradient channels (King County 1994). Residential development is concentrated along the shores of Lake Sammamish and in portions of the upper watershed (King County 1994). High-density residential development is predicted to increase in the upper portions of the watershed (KCCFM 2000). King County field surveys noted no significant water quality problems in any of the Panhandle subbasin drainages. However, all of these drainages have problems with incision in steep stream reaches and sedimentation in the lower reaches (King County 1994). FEMA floodplains are not mapped for any of the streams in this subbasin. However, numerous drainage and local flooding problems within the project area have been reported due to seeps and poor conveyance systems. Generally, development along the trail right-of-way in this subbasin is sparse. Nevertheless, local drainage and flooding problems have been reported in this area due to blocked pipes and ditches and altered flow regimes (King County 1994). Capital improvement projects to replace culverts under the railbed have been identified for several streams (KCCFM 2000).

The East Lake Sammamish area is located on the eastern side of the Seattle metropolitan area and is rapidly becoming a densely urban area. The City of Sammamish was incorporated in 1999 from lands that were formerly unincorporated King County, and has increased rapidly in population growth with both residential and business development.

The NWI and City of Sammamish critical area maps identify Lake Sammamish, but do not show any wetlands in the project area. The nearest NWI-mapped wetlands are north of the project area associated with Lake Sammamish near Marymoor Park.

The NRCS Soil Survey for King County Area identifies five soil mapping units within the project area: Seattle muck, which NRCS identifies as a hydric soil; Kitsap silt loam (2 to 8 percent slopes), and Kitsap silt loam (15 to 30 percent slopes), which are identified as partially hydric; and Alderwood gravelly sandy loam (15 to 30 percent slopes) and Alderwood and Kitsap soils (very steep), which are not identified as a hydric soil.

3.2 WETLANDS

Project biologists delineated eight wetlands in the project area, and estimated one wetland on property west of the trail right-of-way (Figures 3-2a through 3-2e). An additional six wetlands identified for the Sammamish Landing Park project (Anchor Environmental, LLC 2008) occur in the project vicinity. Two are within the trail right-of-way and four are associated with Lake Sammamish, west of the project area. The two Sammamish Landing Park project wetlands within the trail right-of-way were confirmed by King County DPER on June 13, 2012 (Casey 2012). Wetland characteristics are summarized for all wetlands (Table 3-1). A summary of wetland functions and values (Table 3-2), along with detailed descriptions for wetlands identified and delineated by Parametrix, are provided below. Descriptions for Wetlands A, B, C, D, E, and I are summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008). Additional details on the Sammamish Landing wetlands (including wetland determination data forms, rating forms, and functional assessments) are provided in Anchor Environmental, LLC (2008).

Table 3-1. Summary of Wetlands in the Project Vicinity

Wetland	Size (acres)	Ecology/Sammamish Rating ^a	Buffer Width (feet) ^b	USFWS Class ^c	Hydrogeomorphic Class ^d
31A	0.03	III	50	PEM	Depressional/Slope
31B	0.01	IV	50	PEM	Depressional
31C	0.02	IV	50	PEM	Slope
31E	-0.07	III	50	PFO/PSS	Riverine/Slope/Lake Fringe
32A	0.10	III	50	PFO/PSS	Depressional
32B	0.08	III	50	PSS/PEM	Depressional/Riverine
32C	0.05	IV	50	PEM	Depressional/Riverine
33A ^e	-0.04	IV	50	PEM	Slope/Lake Fringe
33B	0.01	III	50	PEM	Depressional
A ^e	0.07	III	50	PFO/PSS/PEM	Lake Fringe
B ^e	0.02	III	50	PFO/PSS/PEM	Lake Fringe
C ^e	0.12	III	50	PFO/PSS/PEM	Lake Fringe
D ^e	0.12	III	50	PFO/PSS/PEM	Lake Fringe
E	0.11	IV	50	PEM	Slope
I	0.03	IV	50	PEM	Slope

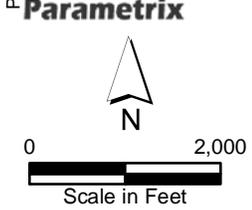
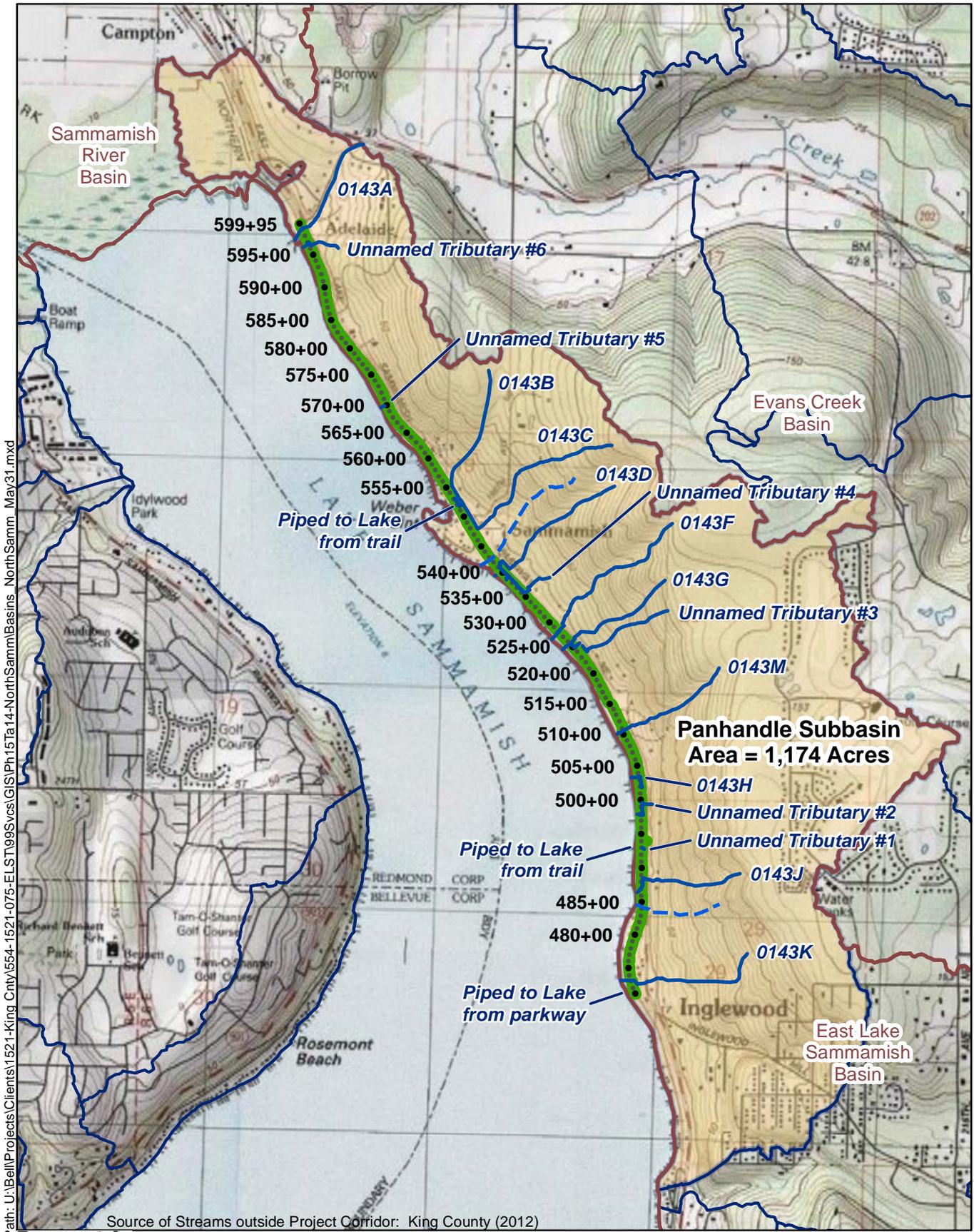
^a Hruby (2004), as specified in SMC 21A.15.1415

^b SMC 21A.50.290

^c Cowardin classification (1979)
 PEM = palustrine emergent
 PFO = palustrine forested
 PSS = palustrine scrub-shrub

^d Brinson (1993)

^e Outside project area



- Stream Crossing Field-verified by Parametrix
- - - Stream Crossing Not Found within Trail Corridor
- King County Drainage Basins
- King County Subcatchments
- Project Drainage Subbasin

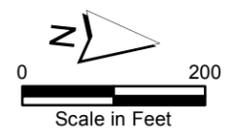
**Figure 3-1
Drainage Basins,
Subbasins and
Site Characteristics**

Path: U:\Bell\Projects\Clients\1521-King_Cnty\554-1521-075-ELST\99S\vs\GIS\Ph15\1a13-CriticalAreas\CriticalAreas2400k_20130125.mxd



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

Parametrix



- | | | | |
|------------------------------|---|----------------------|----------------|
| Wetland | Stream (Crossing Field-verified by Parametrix) | Lake OHWM | City Limits |
| Wetland Buffer | Stream (Crossing Not Found within Trail Corridor) | Shoreline Setback | Existing Trail |
| Stream Buffer | Culvert | Project Right of Way | |
| Wetland and Buffer Continues | | | |

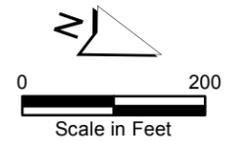
Figure 3-2a
Critical Areas Map
East Lake Sammamish Master Plan Trail
North Sammamish Segment

Path: U:\Bell\Projects\Clients\1521-King_Cnty\554-1521-075-ELST\99Svcs\GIS\Ph15\1a13-CriticalAreas\CriticalAreas2400k_20130125.mxd



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

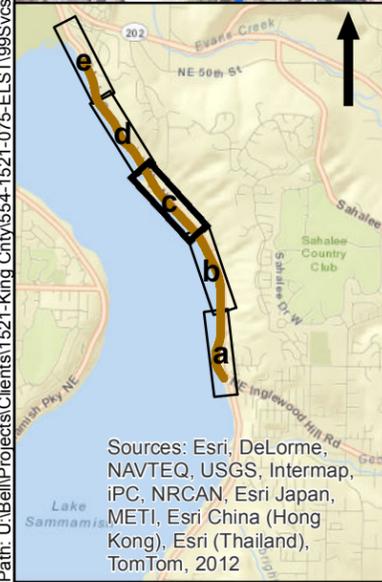
Parametrix



- | | | | |
|----------------|---|-------------------|----------------------|
| Wetland | Stream (Crossing Field-verified by Parametrix) | Lake OOHM | City Limits |
| Wetland Buffer | Stream (Crossing Not Found within Trail Corridor) | Shoreline Setback | Existing Trail |
| Stream Buffer | Wetland and Buffer Continues | Culvert | Project Right of Way |

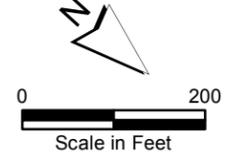
Figure 3-2b
Critical Areas Map
East Lake Sammamish Master Plan Trail
North Sammamish Segment

Path: U:\Bell\Projects\Clients\1521-King_Cnty\554-1521-075-ELST\99S\vs\GIS\Ph15\1a13-CriticalAreas\CriticalAreas2400k_20130125.mxd



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

Parametrix



- Wetland
- Wetland Buffer
- Stream Buffer
- Wetland and Buffer Continues
- Stream (Crossing Field-verified by Parametrix)
- Stream (Crossing Not Found within Trail Corridor)
- Culvert
- Lake OHWM
- Shoreline Setback
- City Limits
- Existing Trail
- Project Right of Way

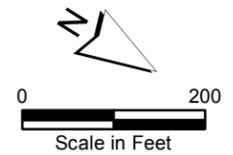
Figure 3-2c
Critical Areas Map
East Lake Sammamish Master Plan Trail
North Sammamish Segment

Path: U:\Bell\Projects\Clients\1521-King_Cnty\554-1521-075-ELST\99Svcs\GIS\Ph15\13-CriticalAreas\CriticalAreas2400k_20130125.mxd



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2012

Parametrix



- | | | | |
|----------------|--|-------------------|----------------------|
| Wetland | Stream
(Crossing Field-verified by Parametrix) | Lake OOHWM | City Limits |
| Wetland Buffer | Stream
(Crossing Not Found within Trail Corridor) | Shoreline Setback | Existing Trail |
| Stream Buffer | Wetland and Buffer Continues | Culvert | Project Right of Way |

Figure 3-2d
Critical Areas Map
East Lake Sammamish Master Plan Trail
North Sammamish Segment

Table 3-2. Summary of Wetland Functions and Values for Wetlands in the Project Area Identified by Parametrix^a

Wetland	Flood Flow Alteration	Sediment Removal	Nutrient and Toxicant Removal	Erosion Control and Shoreline Stabilization	Production of Organic Matter and its Export	General Habitat Suitability	Habitat for Aquatic Invertebrates	Habitat for Amphibians	Habitat for Wetland-Associated Mammals	Habitat for Wetland-Associated Birds	General Fish Habitat	Native Plant Richness	Educational or Scientific Value	Uniqueness and Heritage
31A	-	L	L	-	M	L	M	L	-	-	-	-	-	-
31B	L	L	L	-	L	L	L	L	-	-	-	-	-	-
31C	-	L	L	-	M	-	L	L	-	-	-	-	-	-
31E	-	-	-	M	M	L	L	L	-	-	L	M	-	-
32A	-	L	L	-	M	L	M	M	-	-	-	-	-	-
32B	-	L	L	L	M	L	M	M	-	-	L	-	-	-
32C	-	L	L	L	M	L	M	M	-	-	L	-	-	-
33A ^e	-	L	L	L	L	L	L	L	-	-	L	-	-	-
33B	-	-	-	-	L	-	L	L	-	-	-	-	-	-

H = high

M = moderate

L = low

- = Does not provide this function

^a Wetlands A, B, C, D, E, and I were identified and delineated by Anchor Environmental, LLC (2008)

Wetland 31A

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional/Slope

Ecology Rating: Category III

Data Plots: 31A-SP1, 31A-SP2

Stations: 490+50 to 492+00

Size: 0.03 acre

Wetland 31A is located on the east side of the trail approximately 700 feet north of the intersection of East Lake Sammamish Parkway and NE 18th Place (see Figure 1-2a). The wetland is located entirely within the project area.

Hydrology

Wetland hydrology is maintained by groundwater seeps. The water accumulates in a ditch located along the toe of the trail prism. Three inches of standing water was observed in the ditch during site visits conducted in November 2007. Water flows both north and south from the wetland in the ditch. To the south, the water flows through a buried pipe before discharging into a drainage area that continues the flow under a bridge on the trail; from here the water is piped to the lake. Water flowing north drains into Stream Unnamed 1, which passes through a culvert under the trail and flows west toward Lake Sammamish. Wetland 31A has saturated only and seasonally inundated water regimes.

Vegetation

Wetland 31A contains an emergent wetland community. Vegetation includes giant horsetail, common ladyfern, cattail, reed canarygrass, salmonberry, duckweed, red alder, and common rush.

Soils

Soil in Wetland 31A was examined to a depth of 14 inches and consists of three horizons. The upper horizon is a 10-inch layer of very dark brown (10YR 2/2) gravelly loam. The middle horizon is a 2-inch layer of gray (10YR 5/1) loam with brown (7.5YR 4/4) and greenish gray (5GY 5/1) redoximorphic features. The lower horizon consists mostly of cobbles. Soil in the area is mapped as Kitsap silt loam.

Buffer

Wetland 31A is located in a vegetated corridor between the trail and East Lake Sammamish Parkway. Habitat connectivity along the corridor is disrupted by residential driveways. Forested upland buffer exists to the south and on the slope to the east of the wetland. Vegetation in these buffers consists of salmonberry, California blackberry, giant horsetail, reed canarygrass, Robert's geranium, western sword fern, and bigleaf maple. To the west of the wetland are the trail and single-family residential homes. The buffer to the west is a narrow strip of maintained herbaceous vegetation.

Wetland Classification

Wetland 31A is classified as palustrine emergent under the Cowardin (1979) system and depressional/slope under the hydrogeomorphic (HGM) system (Null et al. 2000; Hruby 2004). Wetland 31A is rated a Category III according to the City of Sammamish and Ecology. This wetland scored 39 points on the Washington State Wetland Rating System for Western Washington rating form (22 points for water quality functions, 8 points for hydrologic functions, and 9 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category III wetlands scoring less than 20 points for habitat functions in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 31A where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 31B

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional

Ecology Rating: Category IV

Data Plots: 31C-SP1, 31C-SP2

Stations: 494+50 to 495+00

Size: 0.01 acre

Wetland 31B is located on the east side of the trail, between the trail and East Lake Sammamish Parkway, approximately 800 feet north of the intersection of East Lake Sammamish Parkway and NE 18th Place (see Figure 1-2b). The wetland is located entirely within the project area.

Hydrology

Hydrology in the wetland is supported by local area runoff. A culvert passing under East Lake Sammamish Parkway discharges stormwater runoff into the wetland at the southeast corner. Water flows north through the wetland before exiting through a culvert that flows north under a gravel parking area and eventually flows to Lake Sammamish. Inundation of up to 2 inches was observed through much of the wetland during site visits conducted in June 2008. Wetland 31B has permanently flooded and saturated only water regimes.

Vegetation

Wetland 31B contains an emergent wetland community. Vegetation in the wetland includes reed canarygrass, fowl mannagrass, giant horsetail, salmonberry, climbing nightshade, common ladyfern, and Himalayan blackberry.

Soils

Soil in Wetland 31B was examined to a depth of 16 inches and consists of two horizons. The upper horizon is a 14-inch layer of black (10YR 2/1) mucky silt loam. The lower horizon is a black (10YR 2/1) mucky gravelly silt loam. Soil in the area is mapped as Kitsap silt loam.

Buffer

Wetland 31B is located in a vegetated strip running north-south between the trail and East Lake Sammamish Parkway. Vegetated upland buffer exists to the east and south of the wetland. The trail is adjacent to the wetland to the west and a gravel-filled parking area is located to the north. Vegetation in the buffer consists of bigleaf maple, western swordfern, Himalayan blackberry, and beaked hazelnut.

Wetland Classification

Wetland 31B is classified as palustrine emergent under the Cowardin (1979) system and depressional under the HGM system (Null et al. 2000; Hruby 2004). Wetland 31B is rated a Category IV according to the City of Sammamish and Ecology. This wetland scored 28 points on the Washington State Wetland Rating System for Western Washington rating form (18 points for water quality functions, 2 points for hydrologic functions, and 8 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category IV wetlands in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 31B where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 31C

USFWS Classification: Palustrine Emergent

HGM Classification: Slope

Ecology Rating: Category IV

Data Plots: 31C-SP1, 31C-SP2

Stations: 485+00 to 485+75

Size: 0.02 acre

Wetland 31C is located on the east side of the trail, between the trail and East Lake Sammamish Parkway, approximately 100 yards north of the intersection of East Lake Sammamish Parkway and NE 18th Place (see Figure 1-2a). The entire wetland is located within the project area.

Hydrology

Wetland hydrology is maintained by groundwater seeps. Water flows downslope and collects in a ditch along the toe of the trail prism. Water flows north in the ditch and then west through a culvert passing under the trail. One inch of standing water was observed in the ditch during site visits conducted in November 2007. Wetland 31C has saturated only and occasionally inundated water regimes.

Vegetation

Wetland 31C contains an emergent wetland community. Dominant vegetation includes reed canarygrass and giant horsetail. Other vegetation present includes Robert's geranium, field bindweed, field horsetail, climbing nightshade, and Himalayan blackberry.

Soils

Soil in Wetland 31C was examined to a depth of 18 inches and consists of two horizons. The upper horizon is a 4-inch layer of black (10YR 2/1) silt loam. The lower horizon is a 14-inch layer of dark gray (10YR 4/1) gravelly sandy loam. Soil in the area is mapped as Kitsap silt loam.

Buffer

Wetland 31C is located in a vegetated strip running north and south between the trail and East Lake Sammamish Parkway. A vegetated upland buffer exists to the north, east, and south of the wetland. Vegetation in the buffer includes bigleaf maple, Himalayan blackberry, giant horsetail, California blackberry, and oceanspray. The buffer provides connectivity to Stream 0143J. Wetland 31E is located to the west, but connectivity is disrupted by the trail. Any buffer located between the wetland and the trail is a narrow strip of maintained vegetation.

Wetland Classification

Wetland 31C is classified as palustrine emergent under the Cowardin (1979) system and slope under the HGM system (Null et al. 2000; Hruby 2004). Wetland 31C is rated a Category IV according to the City of Sammamish and Ecology. This wetland scored 26 points on the Washington State Wetland Rating System for Western Washington rating form (14 points for water quality functions, 5 points for hydrologic functions, and 7 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category IV wetlands in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 31C where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 31E

USFWS Classification: Palustrine Forested/Palustrine Scrub-Shrub

HGM Classification: Riverine/Slope/Lake Fringe

Ecology Rating: Category III

Data Plots: 31E-SP1, 31E-SP2

Stations: 486+50 to 486+75

Size: Approximately 0.07 acre

Wetland 31E is located on the west side of the trail, between the trail and Lake Sammamish, and approximately 100 yards north of the intersection of East Lake Sammamish Parkway and NE 18th Place (see Figure 1-2a). Wetland 31E extends outside of the project area to the west.

Hydrology

Wetland hydrology is maintained by the overbank flow of Stream 0143J. The stream enters the wetland from a culvert that passes under the trail. The stream then flows west through the wetland and into Lake Sammamish. Saturation was observed throughout most of the site during site visits conducted in November 2007. Wetland 31E has saturated only and occasionally flooded water regimes.

Vegetation

Wetland 31E contains forested and scrub-shrub vegetation communities. The forested community is dominated by black cottonwood and Oregon ash. Vegetation in the scrub-shrub community consists of Himalayan blackberry, beaked hazelnut, California blackberry, and red-osier dogwood. Giant horsetail and common ladyfern are present in the understory.

Soils

Soil in the wetland was examined to a depth of 16 inches and consists of three horizons. The upper horizon is a 4-inch layer of black (10YR 2/1) mucky silt loam. The middle horizon is a 7-inch layer of very dark gray (10YR 3/1) gravelly sand. The lower horizon is a 5-inch layer of gray (2.5Y 5/1) loam. Soil in the area is mapped as Kitsap silt loam.

Buffer

Wetland 31E is located in a vegetated patch surrounded by residential development. A vegetated buffer exists to the south of the wetland, Lake Sammamish is located to the west, single-family homes are to the north, and the trail is located to the east. Vegetation in the buffer includes Himalayan blackberry, beaked hazelnut, salmonberry, black cottonwood, and western redcedar. Wetland 31C is located to the east; however, connectivity is disrupted by the trail.

Wetland Classification

Wetland 31E is classified as palustrine forested/palustrine scrub-shrub under the Cowardin (1979) system and riverine/slope/lake fringe under the HGM system (Null et al. 2000; Hruby 2004). Wetland 31E is rated a Category III according to the City of Sammamish and Ecology. This wetland scored 40 points on the Washington State Wetland Rating System for Western Washington rating form (16 points for water quality functions, 8 points for hydrologic functions, and 16 points for habitat functions) (Appendix C). The required buffer width is 50

feet for Category III wetlands scoring less than 20 points for habitat functions in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 31E where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present within the project area. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 32A

USFWS Classification: Palustrine Forested/Palustrine Scrub-Shrub

HGM Classification: Depressional

Ecology Rating: Category III

Data Plots: 32A-SP1, 32A-SP2, 32A-SP3, 32A-SP4

Stations: 532+25 to 534+00

Size: 0.10 acre

Wetland 32A is located in a depression between the trail and East Lake Sammamish Parkway, approximately 300 feet south of the intersection of East Lake Sammamish Parkway and NE 33rd Place (see Figure 1-2c). Wetland 32A is located entirely within the project area.

Hydrology

Wetland hydrology is maintained by seasonally high groundwater and a stormwater ditch. The ditch enters the wetland at the south end from a culvert that passes under East Lake Sammamish Parkway. The water flows along the west side of the wetland before exiting through a culvert that passes west under the trail. The wetland has saturated only and occasionally flooded water regimes.

Vegetation

Wetland 32A has two vegetation communities: scrub-shrub and forested. The scrub-shrub community is dominated by Himalayan blackberry and the forested community is dominated by Oregon ash. Other vegetation present includes snowberry, reed canarygrass, slough sedge, cluster rose, and Pacific ninebark.

Soils

Two wetland soil pits were examined in Wetland 32A. The first soil pit (W32A-SP1) was dug to a depth of 16 inches in the emergent vegetation community and consists of two horizons. The upper horizon is a 9-inch layer of very dark gray (10YR 3/1) silt loam. The lower horizon is a 7-inch layer of black (5Y 2/1) sandy loam. The second wetland soil pit (W32A-SP4) was dug in the forested vegetation community and consists of one 17-inch layer of black mucky loam. Soil in the area is mapped as Kitsap silt loam.

Buffer

The trail borders the wetland to the west. A thin strip of vegetation exists to the south and east between the wetland and East Lake Sammamish Parkway. Wetland 32B is located to the north of the wetland. Vegetation in the buffer consists of reed canarygrass, Himalayan blackberry, giant horsetail, Japanese knotweed, and black cottonwood.

Wetland Classification

Wetland 32A is classified as palustrine forested/palustrine scrub-shrub under the Cowardin (1979) system and depressional under the HGM system (Null et al. 2000; Hruby 2004). Wetland 32A is rated a Category III according to the City of Sammamish and Ecology. This

wetland scored 34 points on the Washington State Wetland Rating System for Western Washington rating form (18 points for water quality functions, 5 points for hydrologic functions, and 11 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category III wetlands scoring less than 20 points for habitat functions in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 32A where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 32B

USFWS Classification: Palustrine Scrub-Shrub/Palustrine Emergent

HGM Classification: Depressional/Riverine

Ecology Rating: Category III

Data Plots: 32B-SP1, 32B-SP2, 32B-SP3, 32B-SP4

Stations: 535+75 to 537+25

Size: 0.08 acre

Wetland 32B is located in a depression between the trail and East Lake Sammamish Parkway, approximately 300 feet south of the intersection of East Lake Sammamish Parkway and NE 33rd Place (see Figure 1-2c). The wetland is located entirely within the project area.

Hydrology

Wetland hydrology is maintained by seasonally high groundwater and the overbank flow of Stream Unnamed 4. The stream enters the wetland near the south end from a culvert that passes under East Lake Sammamish Parkway. The stream flows along the west side of the wetland before exiting through a culvert that passes under a gravel trail and discharges into Wetland 32C; the stream then joins Stream 0143D. This wetland has saturated only and occasionally flooded water regimes.

Vegetation

Wetland 32B has two vegetation communities: scrub-shrub and emergent. The scrub-shrub community contains Pacific willow, snowberry, Oregon ash, red alder, cluster rose, California blackberry, beaked hazelnut, Pacific ninebark, and thimbleberry. The emergent community consists of reed canarygrass, common rush, small-fruited bulrush, and common ladyfern.

Soils

Soil in Wetland 32B was examined to a depth of 18 inches and consists of two horizons. The upper horizon is an 8-inch layer of very dark grayish brown (10YR 3/2) loam. The second horizon is a 10-inch layer of dark grayish brown (2.5Y 4/2) sandy loam with yellowish red (5YR 4/6) redoximorphic features. Soil in the area is mapped as Kitsap silt loam.

Buffer

The trail borders the wetland to the west and a gravel path borders the wetland to the north. Wetland 32C is located north of the path. A thin strip of vegetation exists to the east between the wetland and East Lake Sammamish Parkway. Wetland 32A is located to the south of the wetland. Vegetation in the buffer consists of Himalayan blackberry, English holly, reed canarygrass, orchard grass, ninebark, evergreen blackberry, red fescue, bentgrass, and oceanspray.

Wetland Classification

Wetland 32B is classified as palustrine scrub-shrub/palustrine emergent under the Cowardin (1979) system and depressional/riverine under the HGM system (Null et al. 2000; Hruby 2004). Wetland 32B is rated a Category III according to the City of Sammamish and Ecology. This wetland scored 30 points on the Washington State Wetland Rating System for Western Washington rating form (14 points for water quality functions, 5 points for hydrologic functions, and 11 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category III wetlands scoring less than 20 points for habitat functions in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 32B where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 32C

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional/Riverine

Ecology Rating: Category IV

Data Plots: 32C-SP1, 32C-SP2, 32C-SP3

Stations: 537+50 to 539+00

Size: 0.05 acre

Wetland 32C is located in a depression between the trail and East Lake Sammamish Parkway, approximately 400 feet south of the intersection of East Lake Sammamish Parkway and NE 33rd Place (see Figure 1-2c). The wetland is located entirely within the project area.

Hydrology

Wetland hydrology is maintained by seasonally high groundwater and the overbank flow of Stream Unnamed 4. A seep is located approximately 15 feet up the bank of East Lake Sammamish Parkway. The stream flows from the south to the north end of the wetland, where it supplies an area of inundation, then joins Stream 0143D. This wetland has saturated only and occasionally flooded water regimes.

Vegetation

Wetland 32C is a palustrine emergent wetland. The emergent community is dominated by reed canarygrass, but also contains Himalayan blackberry.

Soils

Soil in Wetland 32C was examined to a depth of 12+ inches and consists of three horizons. The upper horizon is a 4-inch layer of very dark gray (10YR 4/1) silty fine sand. The second horizon is an 8-inch layer of dark gray (10YR 4/1) silty fine sand with strong brown (7.5YR 4/6) redoximorphic features. The third horizon consists of very dark gray (10YR 3/1) loamy fine sand with dark gray (7.5YR 4/1) redoximorphic features. Soil in the area is mapped as Kitsap silt loam.

Buffer

The trail borders the wetland to the west and a gravel path borders the wetland to the north. Wetland 32C is located north of the path. The buffer to the east between the wetland and East Lake Sammamish Parkway is dominated by Himalayan blackberry. Wetland 32B is located to the south of the wetland. Vegetation in the buffer consists of Himalayan blackberry, bluegrass, Nootka rose, snowberry, and reed canarygrass.

Wetland Classification

Wetland 32C is classified as palustrine emergent under the Cowardin (1979) system and depressional/riverine under the HGM system (Null et al. 2000; Hruby 2004). Wetland 32C is rated a Category IV according to the City of Sammamish and Ecology. This wetland scored 27 points on the Washington State Wetland Rating System for Western Washington rating form (14 points for water quality functions, 5 points for hydrologic functions, and 8 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category IV wetlands in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 32C where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland 33A

USFWS Classification: Palustrine Emergent

HGM Classification: Slope/Lake Fringe

Ecology Rating: Category IV

Data Plots: Not Applicable

Stations: 560+00 to 560+50

Size: Approximately 0.04 acre

Wetland 33A is located approximately 600 feet south of the Sammamish Landing Park property, west of the trail, and on private property outside of the trail right-of-way (see Figure 1-2d). The wetland is on a slope that connects down to Lake Sammamish.

Hydrology

Wetland hydrology is supported by seasonally high groundwater and local area runoff. A culvert conveys water from Wetland 33B and the ditch east of the trail to Wetland 33A. During a field visit in February 2012, standing water was observed in ditches along the north and south boundaries. Wetland 33A has seasonally inundated and saturated only water regimes.

Vegetation

Wetland 33A contains emergent vegetation with a few trees. Dominant emergent species include reed canarygrass, small-fruited bulrush, and common ladyfern. Other species include giant horsetail, common rush, red alder, and Oregon ash.

Soils

Soils were not examined in 2007, 2008, or 2012 because the wetland is located outside of the trail right-of-way. Based on the 1999 field investigations, soil in the wetland consists of 10 inches of very dark gray (10YR 3/1), partially decomposed organic material over black (10YR 2/1) cobbly silt. A strong sulfidic odor was also present.

Buffer

Wetland 33A is bounded by residential properties to the north and south that contain structures and partially maintained yards. Himalayan blackberry, reed canarygrass, and giant horsetail dominate vegetated areas east of the wetland near the trail. Lake Sammamish is to the west.

Wetland Classification

Wetland 33A is classified as palustrine emergent wetland under the Cowardin (1979) system and slope/lake fringe under the HGM system (Null et al. 2000; Hruby 2004). Wetland 33A is

rated a Category IV according to the City of Sammamish and Ecology. This wetland scored 26 points on the Washington State Wetland Rating System for Western Washington rating form (16 points for water quality functions, 0 points for hydrologic functions, and 10 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category III wetlands scoring less than 20 points for habitat functions in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Although Wetland 33A was identified and delineated in 1999, it was determined during the 2007-2008 re-delineation that the wetland only occurs on adjacent property and is no longer within the trail right-of-way. The wetland boundary estimate was conducted in February 2012.

Wetland 33B

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional

Ecology Rating: Category III

Data Plots: 33B-SP1, 33B-SP2

Stations: 559+00 to 559+75

Size: 0.01 acre

Wetland 33B is located in a swale between the trail and East Lake Sammamish Parkway, approximately 900 feet north of the intersection of East Lake Sammamish Parkway and NE 36th Street (see Figure 1-2d). Wetland 33B is located entirely within the project area.

Hydrology

Wetland hydrology is maintained by groundwater seeps and local area runoff. The wetland drains into a ditch to the north before flowing west through a culvert that passes under the trail to Wetland 33A. Soil saturation in the upper 12 inches was observed during site visits conducted in November 2007. Wetland 33B has seasonally inundated, occasionally inundated, and saturated only water regimes.

Vegetation

Wetland 33B contains an emergent vegetation community dominated by reed canarygrass. Other vegetation present includes giant horsetail, Kentucky bluegrass, and Himalayan blackberry.

Soils

Soil in Wetland 33B was examined to a depth of 16 inches and consists of two horizons. The upper horizon is an 8-inch layer of very dark brown (10YR 2/2) fine sandy loam with brown (7.5YR 4/4) redoximorphic features. The lower horizon is an 8-inch layer of very dark grayish brown (10YR 3/2) silt loam with strong brown (7.5YR 4/6) redoximorphic features. Soil in the area is mapped as Alderwood gravelly sandy loam.

Buffer

Wetland 33B is bordered to the west by the trail. A thin strip of vegetation exists upslope between the wetland and East Lake Sammamish Parkway. A narrow vegetated corridor exists to the north and south of the wetland between the trail and the parkway. Vegetation in the buffer consists mostly of reed canarygrass, Himalayan blackberry, and giant horsetail.

Wetland Classification

Wetland 33B is classified as palustrine emergent under the Cowardin (1979) system and depressional under the HGM system (Null et al. 2000; Hruby 2004). Wetland 33B is rated a Category III according to the City of Sammamish and Ecology. This wetland scored 38 points on the Washington State Wetland Rating System for Western Washington rating form (24 points for water quality functions, 7 points for hydrologic functions, and 7 points for habitat functions) (Appendix C). The required buffer width is 50 feet for Category III wetlands scoring less than 20 points for habitat functions in the City of Sammamish (SMC 21A.50.290).

Wetland Determination

Biologists flagged the boundary of Wetland 33B where indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were present. The wetland edge generally corresponds with a topographic break where one or more of the wetland indicators was lacking.

Wetland A

USFWS Classification: Palustrine Forested/Palustrine Scrub-Shrub/Palustrine Emergent

HGM Classification: Lake Fringe

Ecology Rating: Category III

Stations: 590+50 to 596+50

Size: 0.07 acre

The following description is summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008).

Wetland A is an approximately 0.07-acre lake fringe wetland associated with Lake Sammamish containing palustrine emergent, palustrine scrub-shrub, and palustrine forested habitat. Because only the inland boundary of Wetland A was delineated, while the waterward side of the wetland was not delineated, the size of Wetland A is approximated. The inland boundary typically ranged from a few feet to about 15 feet inland of the lake's OHWM. At the time of the investigation, Wetland A vegetation typically extended about 5 feet into the standing water of the lake. Vegetation is dominated by Oregon ash, black cottonwood, scouring-rush, and reed canarygrass, with Pacific willow, rose spirea, and slough sedge also occurring. Dominant buffer vegetation in Wetland A includes Himalayan blackberry, Indian plum, and snowberry.

The wetland soils typically consist of black sandy loam in the upper horizon and black sandy loam with gravels below about 8 inches. Upland soils are typically dark brown sandy loam with no mottles within 18 inches of the surface.

Soil saturation was within about 8 inches of the surface in the majority of Wetland A inland of the OHWM. Waterward of the OHWM, soil saturation was at the surface with several inches of standing water associated with the lake. No saturation or free-standing water was observed in the adjacent upland areas.

Wetland B

USFWS Classification: Palustrine Forested/Palustrine Scrub-Shrub/Palustrine Emergent

HGM Classification: Lake Fringe

Ecology Rating: Category III

Stations: 585+75 to 588+50

Size: 0.02 acre

The following description is summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008).

Wetland B is an approximately 0.02-acre lake fringe wetland associated with Lake Sammamish containing palustrine emergent, palustrine scrub-shrub, and palustrine forested habitat. Because only the inland boundary of Wetland B was delineated, while the waterward side of the wetland was not delineated, the size of Wetland B is approximated. Most of the inland boundary of Wetland B is located within a few feet of the inland side of the lake's OHWM. At the time of the investigation, Wetland B vegetation typically extended about 5 feet into the standing water of the lake. Vegetation is dominated by black cottonwood, Pacific willow, red-osier dogwood, Douglas spirea, hardstem bulrush, slough sedge, and scouring rush. Dominant buffer vegetation in Wetland B includes beaked hazelnut, black cottonwood, Nootka rose, sword fern, and California blackberry.

The wetland soils typically consist of black sandy loam in the upper horizon but lack loamy sand below about 8 inches. Upland soils are typically very dark brown sandy loam with no mottles within 18 inches of the surface.

Soil saturation was within about 2 inches of the surface in the majority of Wetland B inland of the OHWM. Waterward of the OHWM, soil saturation was at the surface with several inches of standing water associated with the lake. No saturation or free-standing water was observed in the adjacent upland areas.

Wetland C

USFWS Classification: Palustrine Forested/Palustrine Scrub-Shrub/Palustrine Emergent

HGM Classification: Lake Fringe

Ecology Rating: Category III

Stations: 576+75 to 584+50

Size: 0.12 acre

The following description is summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008).

Wetland C is an approximately 0.12-acre lake fringe wetland associated with Lake Sammamish containing palustrine emergent, palustrine scrub-shrub, and palustrine forested habitat. Because only the inland boundary of Wetland C was delineated, while the waterward side of the wetland was not delineated, the size of Wetland C is approximated. The Wetland C boundary does not extend inland of the OHWM and corresponded with the lake's OHWM boundary. At the time of the investigation, Wetland C vegetation extended about 7 feet into the standing water of the lake. The Wetland C boundary includes four breaks, ranging from about 10 to 20 feet long. These small breaks are areas along the lake shoreline where vegetation is absent. Rather than break Wetland C into several smaller wetlands, it was determined that because the breaks are small, Wetland C would be identified as one continuous wetland system. Vegetation is dominated by red alder, black cottonwood, black twinberry, and rose spirea, with quaking aspen, soft rush, and yellow flag iris also occurring.

Dominant buffer vegetation in Wetland C includes beaked hazelnut, quaking aspen, black cottonwood, Himalayan blackberry, and California blackberry.

The wetland soils typically consist of black sandy loam with gravels in the upper few inches and black loamy sand with gravels below about 3 inches. Upland soils are typically very dark brown sandy loam with gravels with no mottles within 18 inches of the surface.

Soil saturation was at the surface in the majority of Wetland C with free-standing water in the soil pit at 6 inches below the surface. Waterward of the OHWM, soil saturation was at the surface with several inches of standing water associated with the lake. No saturation or free-standing water was observed in the adjacent upland areas.

Wetland D

USFWS Classification: Palustrine Forested/Palustrine Scrub-Shrub/Palustrine Emergent

HGM Classification: Lake Fringe

Ecology Rating: Category III

Stations: 569+00 to 576+50

Size: 0.12 acre

The following description is summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008).

Wetland D is an approximately 0.12-acre lake fringe wetland associated with Lake Sammamish containing palustrine emergent, palustrine scrub-shrub, and palustrine forested habitat. Because only the inland boundary of Wetland D was delineated, while the waterward side of the wetland was not delineated, the size of Wetland D is approximated. The Wetland D boundary does not extend inland of the OHWM and corresponded with the lake's OHWM boundary. At the time of the investigation, Wetland D vegetation extended up to about 8 feet into the standing water of the lake. The Wetland D boundary includes four breaks, ranging from about 10 to 20 feet long. These small breaks are areas along the lake shoreline where vegetation is absent. Rather than break Wetland D into several smaller wetlands, it was determined that because the breaks are small, Wetland D would be identified as one continuous wetland system. Vegetation is dominated by Oregon ash, black cottonwood, quaking aspen, black twinberry, reed canarygrass, and rose spirea. Dominant buffer vegetation in Wetland D includes big-leaf maple, black cottonwood, beaked hazelnut, and Indian plum.

The wetland soils typically consist of black sandy loam with gravels in the upper few inches and black loamy sand with gravels below about 2 inches. Upland soils are typically very dark brown sandy loam with gravels with no mottles within 18 inches of the surface.

Soil saturation was at the surface in the majority of Wetland D with free-standing water in the soil pit at 3 inches below the surface. Waterward of the OHWM, soil saturation was at the surface with several inches of standing water associated with the lake. No saturation or free-standing water was observed in the adjacent upland areas.

Wetland E

USFWS Classification: Palustrine Emergent

HGM Classification: Slope

Ecology Rating: Category IV

Stations: 589+75 to 596+50

Size: 0.11 acre

The following description is summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008).

Wetland E is a 0.11-acre slope wetland with palustrine emergent habitat. The entire boundary of Wetland E was delineated within the project area. Vegetation is dominated by field horsetail, lady fern, and reed canarygrass. Himalayan blackberry encroaches into Wetland E from the east, north, and south. Dominant buffer vegetation in Wetland E includes big-leaf maple, beaked hazelnut, snowberry, sword fern, and Himalayan blackberry. A ditch forms the west boundary of Wetland E and the East Lake Sammamish Trail is located adjacent to the ditch.

The wetland soils typically consist of very dark grayish brown silt loam with light yellowish brown and strong brown mottles in about the first 8 inches, and light brownish gray clay loam with light yellowish brown mottles below about 8 inches.

Upland soils are typically very dark grayish brown silt loam in the first 10 inches with some strong brown mottles below about 7 inches of the surface, and dark grayish brown silt loam with some strong brown mottles below about 10 inches.

Soil saturation was about 10 inches from the surface in the majority of Wetland E with no free-standing water in the soil pit at 18 inches below the surface. No saturation or free-standing water was observed in the adjacent upland areas.

Wetland I

USFWS Classification: Palustrine Emergent

HGM Classification: Slope

Ecology Rating: Category IV

Stations: 576+25 to 578+25

Size: 0.03 acre

The following description is summarized from the Sammamish Landing Wetland and Ordinary High Water Mark Delineation, Sammamish Landing Park Master Plan (Anchor Environmental, LLC 2008).

Wetland I is a 0.03-acre slope wetland with palustrine emergent habitat. The entire boundary of Wetland I was delineated within the project area. Vegetation is dominated by lady fern and reed canarygrass. Himalayan blackberry encroaches into Wetland I from the east, north, and south. Dominant buffer vegetation in Wetland I includes big-leaf maple, snowberry, and Himalayan blackberry. A ditch forms the west boundary of Wetland I and the East Lake Sammamish Trail is located adjacent to the ditch.

The wetland soils typically consist of dark gray silt loam for more than 18 inches below the surface. Upland soils are typically dark grayish brown sandy loam with gravels and no mottles within 18 inches of the surface. Soil saturation was at the surface in the majority of Wetland I with free-standing water in the soil pit at 6 inches below the surface. No saturation or free-standing water was observed in the adjacent upland areas.

3.3 STREAMS

Fifteen streams were identified in the project area (Table 3-3; Figures 1-2a through 1-2e). Streams in the North Sammamish Segment are small and little information is available. Generally, these are short streams with silt or sand substrates that flow through culverts or conduits, which are barriers to fish passage. Therefore, detailed descriptions for individual streams are not provided.

For the majority of these streams, information is lacking on fish presence or absence. Field reconnaissance was used to determine the quality and quantity of available salmonid habitat (where access was allowed); therefore, the likelihood of fish use was assessed by professional judgment. This approach was conservative, as it is extremely unlikely that all streams that contain fish habitat features are currently occupied. These evaluations were combined with stream classification codes from the City of Sammamish and King County to classify these remaining streams as either (potentially) fish-bearing or non-fish-bearing. A total of eight streams were classified as having potential fish use, while seven other streams were classified as unlikely or non-fish-bearing.

Although salmonid use has not been documented in any streams in this basin (Ecology 1994), Stream 0143F is notable because of the presence of a coho salmon egg incubator located downstream of the trail crossing. The incubator box, capable of hatching 50,000 coho salmon fry, has been previously funded by the Mid-Sound Regional Fisheries Enhancement Group.

Table 3-3. Summary of Streams Crossing the Project Area

Stream Name	Station	Stream Classification ^a	Buffer Width ^b (feet)	Fish Use
0143K ^c	473+00	Np	NA ^d	No
0143J	487+25 to 489+00	F	150	Potential
Unnamed 1	493+00	Np	75	No
Unnamed 2	497+75 to 499+50	F	150	Potential
0143H	499+50 to 503+50	F	150	Potential
0143M	510+50	F	150	Unlikely
Unnamed 3	524+75 to 525+50	F	150	Potential
0143G	525+50	F	150	Potential
0143F	528+00	F	150	Potential
Unnamed 4	535+50 to 539+00	F	150	Potential
0143D	539+00 to 541+75	F	150	Potential
0143B	551+75 to 553+00	F	150	Unlikely
Unnamed 5 ^c	570+00	Np	75	No
Unnamed 6	596+50 to 597+00	Ns	50	Unlikely
0143A	599+25	Np	75	Unlikely

^a SMC 21A.15.1240 and WAC 222-16-031

^b SMC 21A.50.330

^c Stream is piped entirely in project area.

^d No stream buffer in project area because stream is piped from East Lake Sammamish Parkway to Lake Sammamish.

3.4 LAKE SAMMAMISH

Lake Sammamish, with a surface area of approximately 4,900 acres, is one of the largest lakes in the Puget Sound Basin (King County 1990). The lake receives flow primarily from Issaquah Creek and discharges north through the Sammamish River to Lake Washington, Lake Union, and Puget Sound. Most of the watershed is located within the King County urban growth area boundary and is (or is proposed to be) developed with high-density residential and commercial

land uses (King County 1994; KCCFM 2000). Within the project area residential development has been concentrated between the East Lake Sammamish Parkway and the lakeshore.

Lake Sammamish serves as a rearing environment and migratory pathway for both resident and anadromous salmonids, with Chinook, coho, sockeye, and kokanee salmon; steelhead; and coastal cutthroat trout likely to be found in the lake and its tributaries (King County 1990; Pfeifer 1992). Other than one unconfirmed anecdotal account, there is no documentation of bull trout presence in the Lake Sammamish Watershed. Tributary thermal regimes are unsuitable for reproduction by this species, and there is no known local spawning population in low-elevation tributaries of either Lake Washington or Lake Sammamish (WDFW 1998). Lake Sammamish also contains a diverse population of resident non-salmonid species, including largemouth bass, yellow perch, brown bullhead, and black crappie (King County 1990).

Lake Sammamish is a shoreline of the state, regulated under the City of Sammamish SMP (effective August 31, 2011). The project area is within Urban Conservancy and Shoreline Residential shoreline designations. According to the SMP 25.06.020(9), Lake Sammamish has a 50-foot shoreline setback. Residential structures and associated landscaping cover most of the setback in the project area with the Sammamish Landing Park and undeveloped parcels dominating the northern quarter.

3.5 FISH AND WILDLIFE HABITAT CONSERVATION AREAS

Based on a review of existing information and site conditions, there are no known or expected areas within the North Sammamish Segment project area with which state or federally designated endangered, threatened, and sensitive species have a primary association. Additionally, there are no state natural area preserves or natural resource conservation areas, or wildlife habitat corridors in the project area.

Wetlands, streams, and the shoreline setback for Lake Sammamish are located within the project area. According to SMC 21A.50.325(1), if the habitat conservation area is also classified as a stream, lake, pond, or a wetland, then the stream, lake, pond, or wetland protection standards shall apply and habitat management shall be addressed as part of the stream, lake, pond, or wetland review. Habitat conservation areas that are lakes shall be governed by the requirements of the Sammamish SMP (SMC 21A.50.325(3)). See Sections 3.2, 3.3, and 3.4 for information on wetlands, streams, and Lake Sammamish.

3.6 CRITICAL AQUIFER RECHARGE AREAS

City of Sammamish CARA maps identify Class 3 wellhead protection zones within portions of the project area.

4. IMPACT ASSESSMENT

This section describes the extent and type of permanent and temporary impacts on critical areas and associated buffers that would occur as a result of the proposed project.

4.1 WETLANDS

No wetlands would be permanently affected as a result of this project. However, a small amount of temporary impacts on one wetland and some permanent and temporary impacts on buffers are unavoidable (Table 4-1; Appendix D). This section describes the extent and type of temporary and permanent impacts on wetland and wetland buffers that would occur as a result of constructing the proposed trail project. Wetland buffers, stream buffers, and the shoreline setback often overlap in the project area. Where overlap occurs, impacts are prioritized by wetland buffer, stream buffer, and then shoreline setback. Only impacts on areas that are defined solely as wetland buffers are reported in this section.

Table 4-1. Summary of Impacts on Wetlands and Buffers

Wetland	Ecology/ Sammamish Rating ^a	Wetland		Buffer	
		Perm. Impacts acres (SF)	Temp. Impacts acres (SF)	Perm. Impacts acres (SF)	Temp. Impacts acres (SF)
31A	III	-	-	<0.01 (126)	0.01 (532)
31B	IV	-	-	0.03 (1,246)	0.02 (723)
31C	IV	-	-	0.03 (1,327)	0.02 (759)
31E	III	-	-	0.02 (768)	0.01 (488)
32A	III	-	-	0.06 (2,630)	0.03 (1,391)
32B	III	-	-	0.04 (1,859)	0.02 (1,065)
32C	IV	-	-	0.04 (1,874)	0.03 (1,474)
33A	IV	-	-	0.03 (1,289)	0.02 (765)
33B	III	-	-	<0.01 (127)	<0.01 (200)
A	III	-	-	-	-
B	III	-	-	0.06 (2,475)	0.03 (1,119)
C	III	-	-	-	-
D	III	-	-	-	-
E	IV	-	<0.01 (16)	0.18 (7,776)	0.09 (3,703)
I	IV	-	-	-	0.01 (226)
Total		-	<0.01 (16)	0.49 (21,497)	0.29 (12,445)

^a Hruby (2004), as specified in SMC 21A.15.1415
 Perm. = Permanent, Temp. = Temporary, SF = square feet

4.1.1 Temporary Wetland Impacts

An existing clay pipe associated with Wetland E will need to be replaced as part of the trail widening and drainage improvements. Installation of the new concrete pipe will require the temporary clearing and grading of 16 square feet of wetland (Appendix D, Figure D-14). Vegetation consists of reed canarygrass, giant horsetail, and Himalayan blackberry.

4.1.2 Permanent Wetland Buffer Impacts

Permanent impacts occur when there is a permanent loss of wetland buffer area, typically as a result of paving or permanent clearing. Construction activities that would result in permanent wetland buffer impacts include trail widening; driveway reconfigurations; stair replacements; culvert replacements; and stormwater drainage features.

The project would permanently affect portions of 11 wetland buffers (see Table 4-1). Approximately 0.49 acre of wetland buffer would be eliminated as a result of trail widening and realignment. The buffer of Wetland E would have the largest affected area (0.18 acre), which accounts for approximately 37 percent of the total permanent buffer impacts. The remaining affected wetland buffer areas are 0.06 acre or less. The majority of the wetland buffers to be affected by the project are narrow linear swathes immediately adjacent to the Interim Use Trail vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and native trees and shrubs. Minimal effects on wetland buffer functions are anticipated.

4.1.3 Temporary Wetland Buffer Impacts

The buffer of 12 wetlands would be temporarily affected during construction. In total, construction would temporarily affect 0.29 acre of wetland buffer (see Table 4-1). Temporary impacts on wetland buffers consist of minor clearing and grading outside of the trail footprint to enable project construction. These construction work areas along the edge of the proposed trail have been conservatively estimated for this project. Once construction is complete, regrowth is expected relatively quickly from the seeds, roots, tubers, stems, and other propagules in the soil under the temporary impact areas. The majority of the wetland buffers to be cleared and graded are primarily vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and native trees and shrubs. Temporarily disturbed buffers will be restored by reseeding or replanting with appropriate native species when construction activities are finished.

4.2 STREAMS

Although the project was designed with specific features to avoid and minimize impacts on critical areas, some unavoidable impacts on streams and stream buffers would result from the trail widening, realignment, and drainage improvements (Table 4-2; Appendix D). Stream buffers, wetland buffers, and the shoreline setback often overlap in the project area. Where overlap occurs, impacts are prioritized by wetland buffer, stream buffer, and then shoreline setback. Only impacts on areas that are defined solely as stream buffers are reported in this section.

Stream channel and stream buffer impacts can be classified as either permanent or temporary:

- Permanent impacts occur when fill is placed in a stream or a stream is piped, or when a designated stream buffer area is permanently cleared, resulting in a net loss of open stream channel or buffer.
- Stream impacts are considered temporary when a stream is temporarily diverted or relocated to accommodate construction, a stream channel is regraded, or when a designated stream buffer area is temporarily cleared to allow for project construction activities.

Stream channel loss results in permanent loss of in-stream habitat. In-stream habitat directly supports fish and other aquatic life by providing specific physical and biological elements for the rearing, feeding, spawning, and migration of aquatic species.

Stream buffers are also important, contributing both directly and indirectly to the health of streams and the fish that inhabit those streams. Properly functioning stream buffers provide stream side shade and a source of large woody debris (LWD), contribute organic debris to the stream, stabilize stream banks, reduce fine sediment input into streams, filter nutrients and pollutants, and reduce and detain flood waters (Beschta et al. 1987; McDade et al. 1990; Sedell and Beschta 1991). The effectiveness of a stream buffer is dependent on three primary factors: the type of vegetation within the buffer, the density of the vegetation, and the width of the buffer. Mature forest provides the highest level of riparian functions, although mature conifer forest provides greater riparian function than mature hardwood forest, particularly LWD recruitment (McDade et al. 1990). Immature forest or shrub-dominated riparian communities can support some riparian functions (stream bank stabilization, nutrient input, filtration of fine sediment), although these functions are provided at a significantly lower level than in mature forested systems, and some functions (LWD recruitment) are almost completely lacking. Likewise, riparian systems consisting of herbaceous vegetation (e.g., grasses) provide minimal riparian functions, particularly in regards to supporting habitat needs of salmonids (cold, clear water; habitat complexity; and in-stream cover).

4.2.1 Stream Channel Impacts

Stream channels are permanently affected when a stream passes under the trail in a culvert that requires lengthening, or when a stream occurs within the footprint of the proposed trail. Based on current design, 13 linear feet (41 square feet) of one stream (Stream Unnamed 6, Type Ns) would be permanently lost due to culvert replacement. However, the replacement of culverts on four streams (Streams 0143H, 0143G, 0143F, and 0143D—all Type F) would result in a channel gain of 31 linear feet (185 square feet). One additional stream (Stream 0143M, Type F) will have a no net gain or loss of channel. The replacement of the existing culvert with shorter wider culverts will result in a net gain of 18 linear feet and a net increase in stream channel area of 144 square feet. Details on specific culvert replacements are provided below.

Temporary impacts on channels will occur on some streams where regrading is needed for culvert replacements or ditch realignment. Regrading of the channel (upstream and downstream) at culvert replacement areas will improve stream profile and slope. Temporary stream bypasses would be used during construction of the new culverts.

Stream Unnamed 6 Culvert Replacement

The existing 12-inch clay culvert on Stream Unnamed 6 (Station 596+92) will be replaced with a Type 1 catch basin and a 24-inch concrete culvert. This culvert size is an upgrade to match the size of the upstream 24-inch culvert that crosses beneath the East Lake Sammamish Parkway. There is no fish presence in this stream; therefore, fish passage culvert design is not required. The existing culvert outfall is perched approximately 1.5 feet, and erosion is present. The catch basin will serve as an energy dissipater and the 2 percent culvert slope will greatly reduce the potential for erosion to the downstream channel. Without the catch basin, the culvert would have a 15.6 percent slope, and the stream would need to be armored with riprap to prevent erosion from becoming a problem. A beehive grate will be installed on top of the catch basin to limit debris from obstructing drainage. This culvert replacement will result in the permanent loss of 13 linear feet (41 square feet) of open stream channel.

Table 4-2. Summary of Impacts on Stream Channels and Buffers

Stream	Sammamish Rating ^a	Stream Channel Perm. Loss		Stream Channel Perm. Gain		Stream Channel Temp. Impact		Stream Buffer	
		Linear Feet	Square Feet	Linear Feet	Square Feet	Linear Feet	Square Feet	Perm. Impact acres (SF)	Temp. Impact acres (SF)
0143K ^b	Np	-	-	-	-	-	-	-	-
0143J	F	-	-	-	-	-	-	0.01 (616)	0.03 (1,215)
Unnamed 1	Np	-	-	-	-	-	-	<0.01 (16)	0.01 (567)
Unnamed 2	F	-	-	-	-	-	-	0.08 (3,506)	0.03 (1,325)
0143H	F	-	-	+7	+43	14	98	0.07 (3,108)	0.05 (2,381)
0143M	F	-	-	-	-	10	53	0.04 (1,730)	0.04 (1,694)
Unnamed 3	F	-	-	-	-	-	-	0.02 (846)	0.01 (577)
0143G	F	-	-	+5	+28	9	75	0.07 (3,050)	0.03 (1,506)
0143F	F	-	-	+3	+30	4	14	0.06 (2,406)	0.05 (1,998)
Unnamed 4	F	-	-	-	-	-	-	0.03 (1,175)	0.02 (709)
0143D ^c	F	-	-	+16	+84	78	378	0.06 (2,412)	0.06 (2,830)
0143B	F	-	-	-	-	NA ^d	56	0.09 (3,913)	0.05 (2,215)
Unnamed 5 ^b	Np	-	-	-	-	-	-	-	-
Unnamed 6	Ns	13	41	-	-	7	42	0.01 (516)	0.01 (419)
0143A	Np	-	-	-	-	-	-	-	0.01 (324)
Total		13	41	+31	+185	122	716	0.53 (23,294)	0.41 (17,760)

^a SMC 21A.15.1240

^b Stream is piped entirely in project area

^c Culvert is being replaced for fish passage as mitigation for Stream 0143M

^d Only one side of the channel (not entire width) will be temporarily disturbed during construction

Perm. = Permanent, Temp. = Temporary, SF = square feet, NA = not applicable

Stream 0143H Culvert Replacement

The existing twin 24-inch concrete culverts are each 23 feet long, and do not have sufficient length to accommodate the proposed trail widening. Therefore, the culverts will be replaced by a fish passage culvert. Stream 0143H has an average measured bankfull width of 4 feet, with slopes of approximately 3 percent upstream of the culvert and less than 1 percent downstream of the culvert. The twin culverts have slopes of 4.87 and 4.96 percent, respectively, and a full flow capacity of 118 cubic feet per second (cfs). The reduced culvert length of the new 6-foot-span by 6-foot-rise concrete culvert will increase the length of the open channel stream by 7 feet. Additionally, approximately 14 feet of stream will be regraded at the culvert outfall. The culvert bed will be countersunk, and the streambed slope will be 4.81 percent through the culvert. This culvert replacement will result in the permanent gain of 7 linear feet (43 square feet) of open stream channel.

Stream 0143M Culvert Replacement

Although a Type F stream, the culvert at Stream 0143M will not be replaced with a fish passage culvert. Instead, a fish passage mitigation culvert will be installed on another fish-bearing stream (Stream 0143D). This decision was made because the stream habitat immediately upstream of this culvert is a fish passage barrier due to steep existing stream grades, which are greater than 20 percent, and there is more accessible stream channel upstream of the trail crossing for Stream 0143D than Stream 0143M currently. Additionally, King County records note that during construction of the interim trail in 2006, a large storm event overwhelmed the fully silted culvert and the flows overtopped the trail at this location. A 12-inch-diameter culvert was installed above the half-buried 24-inch culvert. There have not been any flooding problems since this new installation. To address the sedimentation and high flow capacity, the project will install a 36-inch concrete culvert to replace the existing culverts. This culvert replacement will result in no net gain or loss of open stream channel.

Stream 0143G Culvert Replacement

The existing 36-inch corrugated metal pipe (CMP) culvert is 23 feet long and does not have sufficient length to accommodate the proposed trail widening. Stream 0143G has potential fish presence and replacement of the culvert would improve connectivity to approximately 45 feet of upstream habitat on Stream 0143G and approximately 110 feet of upstream habitat on Stream Unnamed 3. Therefore, the culvert will be replaced by a fish passage culvert. Stream 0143G has an average measured bankfull width of 3.25 feet, with steep slopes up to 20 percent upstream of the culvert and up to 7 percent downstream. The existing culvert has a slope of 6.78 percent, and a full flow capacity of 94 cfs. The reduced length of the new 6-foot-span by 5-foot-rise concrete culvert will increase the length of open stream channel by 5 feet. Additionally, approximately 9 feet of stream will be regraded at the culvert outfall. The short regrade will improve the stream profile by allowing the culvert slope to remain similar to existing conditions, and removing the potential of a perched culvert end. The culvert bed will be countersunk, and the streambed slope will be 6.13 percent through the culvert. This culvert replacement will result in the permanent gain of 5 linear feet (28 square feet) of open stream channel.

Stream 0143F Culvert Replacement

The existing 18-inch Advanced Drainage Systems (ADS) culvert is 21 feet long and does not have sufficient length to accommodate the proposed trail widening. Stream 0143F has potential fish presence and replacement of the culvert would improve connectivity up to 40 feet of upstream habitat. Therefore, the culvert will be replaced by a fish passage culvert. Stream 0143F has an average measured bankfull width of approximately 4 feet, with steep slopes up to 11 percent upstream of the culvert and up to 7 percent downstream. The existing

culvert has a slope of 4.10 percent, and a full flow capacity of 25 cfs. The reduced length of the new 6-foot-span by 4-foot-rise concrete culvert will increase the length of open channel stream by 3 feet. The calculated span of the fish passage culvert is 6.8 feet, but odd-sized culverts are not standard in precast sizes, therefore, the width was rounded down to 6 feet wide. This stream is similar to the other streams proposed for fish passage culvert replacement, and it is anticipated that 6 feet will provide adequate conditions for passage of fish given the short length of culvert. The channel through the culvert will be roughened with streambed cobbles to slow the water and increase the water depth. The culvert bed will be countersunk, and the streambed slope will be 5.56 percent through the culvert. Finally, approximately 4 feet of stream will be regraded at the culvert outfall. This short regrade will improve the stream profile by extending the stream slope until it matches the existing streambed elevation, thus removing the potential of a perched culvert end. This culvert replacement will result in the permanent gain of 3 linear feet (30 square feet) of open stream channel.

Stream 0143D Culvert Replacement

The existing 24-inch concrete culvert is not damaged, and it will not be affected by the proposed trail widening. Rather, this culvert is being replaced for fish passage as mitigation for the Stream 0143M culvert at Station 510+55. The stream has an average measured bankfull width of 3.5 feet, with moderate slopes upstream averaging 4 percent and steeper slopes downstream up to 12 percent. In addition, the downstream culvert end is perched approximately 2 feet. The existing culvert has a slope of 1.44 percent, and a full flow capacity of 32 cfs. The proposed design will install a 16-foot-long, 6-foot-span by 7-foot-rise concrete culvert. The culvert bed will be countersunk, and the streambed slope will be 4.0 percent through the culvert. The reduced culvert length will increase the length of open channel stream 16 feet. Additionally, approximately 20 feet of stream will be regraded at the culvert outfall. The regrade will remove the 2-foot perched end and replace it with a new streambed at 11 percent slope. This culvert replacement will result in the permanent gain of 16 linear feet (84 square feet) of open stream channel.

A 60-foot section of the creek will also be re-graded between the trail and East Lake Sammamish Parkway removing two obstructions (boulders) that are fish passage barriers. These boulders will be removed as part of the mitigation. Stream 0143D has potential fish presence. Replacement of the culvert along with the boulder removal would improve connectivity to approximately 575 feet of upstream habitat (235 feet on Stream 0143D and 340 feet on Unnamed 4).

4.2.2 Permanent Stream Buffer Impacts

In addition to effects on stream channels, the trail improvements will result in a permanent loss of stream buffers. Similar to permanent impacts on wetland buffers, permanent impacts on stream buffers occur when there is a permanent loss of stream buffer area, typically as a result of paving or permanent clearing. Construction activities that would result in permanent stream buffer impacts include trail widening, driveway reconfigurations, stair replacement, culvert replacements, and stormwater drainage features.

The project would result in permanent clearing of 0.53 acre of 12 stream buffers (see Table 4-2). Impacts on buffers of each individual stream would be 0.09 acre or less. The majority of the stream buffers to be affected by the project are narrow linear swathes immediately adjacent to the Interim Use Trail vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and native trees and shrubs. Minimal effects on stream buffer functions are anticipated.

4.2.3 Temporary Stream Buffer Impacts

The buffer of 13 streams would be temporarily affected during construction. In total, construction would temporarily affect 0.41 acre of stream buffer (see Table 4-2). Temporary impacts on stream buffers consist of minor clearing and grading outside of the trail footprint and around culvert replacement sites to enable project construction. These construction work areas have been conservatively estimated for this project. Once construction is complete, regrowth is expected relatively quickly from the seeds, roots, tubers, stems, and other propagules in the soil under the temporary impact areas. The majority of the stream buffers to be cleared and graded are primarily vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and native trees and shrubs. Temporarily disturbed buffers will be restored by reseeding or replanting with appropriate native species when construction activities are finished.

4.3 LAKE SAMMAMISH

Lake Sammamish is outside the project area and would not be permanently or temporarily affected by construction of the proposed trail. However, some permanent and temporary impacts on the outermost portion of the 50-foot shoreline setback are unavoidable (Appendix D). Wetland buffers, stream buffers, and the shoreline setback often overlap in the project area. Where overlap occurs, impacts are prioritized by wetland buffer, stream buffer, and then shoreline setback. Only impacts on areas that are defined solely as shoreline setback are reported in this section.

4.3.1 Shoreline Setback Impacts

The proposed trail crosses the shoreline setback in a few locations, permanently clearing 0.03 acre (1,192 square feet). An additional 0.03 acre (1,183 square feet) will be temporarily cleared or graded outside of the trail footprint. Temporarily disturbed shoreline setback areas will be restored by reseeding or replanting with appropriate native species when construction activities are finished.

4.4 CRITICAL AQUIFER RECHARGE AREAS

The trail has qualified for an exception from the flow control facilities and flow control BMPs requirements (Parametrix 2013). While there are no flow control facilities proposed for the project, there are infiltration trenches proposed in a few areas to infiltrate runoff from the trail. There are no target areas within the project requiring water quality treatment (Parametrix 2013). The new trail surface will be non-pollution generating impervious surface; therefore, water quality treatment facilities are not required.

5. MITIGATION APPROACH

This section describes the sequencing approach used for mitigating project impacts. The mitigation sequencing approach is based on a hierarchy of avoiding and minimizing adverse impacts through careful design, rectifying temporary impacts, and compensating for unavoidable adverse impacts (Ecology et al. 2006). Permanent and temporary impacts on wetland buffers, streams, stream buffers, and the Lake Sammamish shoreline setback are shown in Appendix D.

5.1 AVOIDANCE AND MINIMIZATION

The avoidance and minimization of critical area impacts was a guiding principle in the preliminary design of this project. It started with the general alignment of the trail. King County worked diligently to avoid and minimize permanently affecting wetlands and streams. Design refinements were considered and incorporated, where feasible, to reduce the potential loss of existing wetland and stream habitat. King County is proposing an alignment that follows the existing Interim Use Trail, which is also the location of a former railbed. With this alignment, all wetlands will be avoided, culvert replacements will provide a benefit to streams with a net increase in open channel, and buffer and shoreline setback impacts are limited to the area needed to widen the existing trail. The current design also incorporates the following strategies to minimize critical area and buffer impacts:

- **Apply the narrowest typical trail section when adjacent to critical areas.** In the environmental documentation for the proposed trail, King County envisioned a trail as wide as 27 feet in some areas, which incorporated a separate soft-surface trail for pedestrian use. Based on the amount of impacts that resulted from this configuration and subsequent discussions with the City of Sammamish, King County has narrowed the proposed width of the trail to 18 feet (the narrowest typical section) throughout Sammamish. This includes 12 feet of pavement, two 2-foot shoulders, and two 1-foot clear zones.
- **Use retaining walls to narrow the trail section where critical areas are adjacent or crossed.** This includes adding 19 retaining walls adjacent to wetlands, streams, and buffers.
- **Shift alignments away from critical areas.** Throughout Sammamish, the proposed configuration of the trail encompasses the existing gravel trail. In some areas, the trail is bounded by critical areas on both sides, or the buffer crosses the trail. However, slight shifts in the center line and adjustments to the profile were closely examined and incorporated, where practical, to minimize critical area impacts.
- **Reduce potential for human and pet intrusion through the use of fencing and signage.** King County typically uses split-rail fence between the trail and an adjacent critical area, unless an edge hazard warrants a different kind of fence (e.g., chain link).

Best management practices (BMPs) will be implemented to avoid or reduce adverse impacts on critical areas during construction. BMPs will be implemented for pollution, erosion control, and stormwater management. Measures used may include mulching, matting, and netting; filter fabric fencing; quarry rock entrance mats; sediment traps and ponds; and surface water interceptor swales and ditches. Significant long-term water quality impacts are not expected if erosion control BMPs, stormwater, and spill containment measures are properly implemented, monitored, and maintained during construction. A temporary erosion and sedimentation control (TESC) plan will be implemented to minimize and control pollution and erosion from stormwater.

5.2 RESTORATION OF TEMPORARY IMPACTS

Temporary impacts on wetlands, wetland buffers, stream buffers, and the shoreline setback totaling <0.01 acre (16 square feet), 0.29 acre, 0.41 acre, and 0.03 acre, respectively, will be restored on site at the affected locations along the project corridor after construction. Temporarily disturbed wetlands, wetland buffers, and stream buffers will be reseeded or replanted with appropriate native species when construction activities are finished.

Temporary impacts on stream channels will be regraded and substrate will be restored with gravel and rounded cobble.

5.3 COMPENSATORY MITIGATION

Because permanent impacts on streams, wetland buffers, stream buffers, and the Lake Sammamish shoreline setback could not be completely avoided, King County will replace the area and functions lost through compensatory mitigation.

5.3.1 Streams

5.3.1.1 Regulatory Requirements

The City of Sammamish requires compensatory mitigation for alteration to streams in order to achieve equivalent or greater functions (SMC 21A.50.350).

5.3.1.2 Site Selection

The City of Sammamish has a preference that mitigation actions shall be in-kind and conducted within the same subbasin and on the same site as the alteration. Culvert replacement and stream regrading will occur on site as described in Section 4.2.1.

5.3.1.3 Proposed Mitigation

Although the project proposes to replace culverts on five streams (four of which are Type F), the overall change is a net improvement to stream function and habitat. New culverts will be wider and shorter, resulting in a net gain of 18 linear feet (144 square feet) of open channel. Stream Unnamed 6 (Type Ns) is the only stream that will result in channel loss (13 linear feet [41 square feet]). Three Type F stream culvert replacements are designed to fish passage standards. It was determined that the culvert on Stream 0143M would not be replaced to fish passage standards because the stream habitat immediately upstream of this culvert is a fish passage barrier due to steep existing stream grades greater than 20 percent. Therefore, the culvert on Stream 0143D will be replaced with a fish passage culvert as mitigation. Another fish barrier (two boulders) will be removed from Stream 0143D upstream of the trail crossing, in the reach between the trail and East Lake Sammamish Parkway. Replacement of the culvert along with the boulder removal would improve connectivity to approximately 575 feet of upstream habitat (235 feet on Stream 0143D and 340 feet on Unnamed 4). The culvert replacement on Stream 0143D, and all other streams, is described in Section 4.2.1.

5.3.2 Wetland Buffers, Stream Buffers, and Shoreline Setback

Mitigation for wetland buffers, streams buffers, and the shoreline setback are described together because these three areas often overlap and mitigation for these are consolidated to two locations in the project area.

5.3.2.1 Regulatory Requirements

The City of Sammamish requires compensatory mitigation for alteration to wetland buffers to achieve equivalent or greater biological functions, as well as a no net loss of area (SMC 21A.50.310). Mitigation actions shall also provide equivalent or greater functions and values compared to conditions existing prior to the proposed alteration. King County is proposing a minimum 1:1 mitigation ratio for impacts on wetland buffers by increasing the buffer around one wetland and enhancing this area where feasible.

Similar to wetland buffer mitigation requirements, mitigation for alteration to stream buffers shall achieve equivalent or greater functions (SMC 21A.50.350). The SMP also applies the concept of no net loss of ecological functions (SMP 25.02.010(58)). King County is proposing a 1:1 mitigation ratio for impacts on stream buffers and the shoreline setback by applying enhancement.

5.3.2.2 Site Selection

The City of Sammamish has a preference that mitigation actions shall be in-kind and conducted within the same subbasin and on the same site as the alteration. The right-of-way consists of a long, linear corridor that abuts small portions of several wetlands, and the possibility was considered that mitigation areas in the trail corridor would be small and fragmented. However, the project team was able to reduce impacts on wetland buffers, thereby decreasing mitigation needs to the point that on-site mitigation areas with available acreage and the opportunity to increase the ecological benefit could be proposed at two consolidated locations in the corridor. Sites adjacent to the trail also offer easy access for both construction and maintenance with minimal disturbance to other habitats. On-site areas will provide an opportunity for visual and aural screening of the Lake Sammamish Parkway for both wildlife and trail users. Specific mitigation areas are discussed in the following section.

5.3.2.3 Proposed Mitigation

King County is proposing to complete compensatory mitigation at two consolidated sites in the Master Plan Trail right-of-way (Appendix E). The proposed mitigation will include 0.50 acre of increased wetland buffer to offset 0.49 acre of permanent wetland buffer impacts, 0.49 acre of stream buffer enhancement and 0.05 acre wetland buffer enhancement (contiguous with the stream buffer enhancement) to offset 0.53 acre of permanent stream buffer impacts, and 0.03 acre of shoreline setback enhancement to offset 0.03 acre of permanent shoreline setback impacts. The proposed compensatory mitigation will include removing invasive vegetation, tilling and amending soil, adding mulch, and planting with native vegetation. Deciduous and coniferous tree species and shrubs will be planted to increase plant diversity, increase vegetation complexity, offer visual and aural screening, improve wildlife habitat, and provide shade, leaf litter, future snags, and woody debris. Habitat features (including habitat logs and brush piles) will be added to the stream buffer and wetland buffer enhancement area. Fencing will be installed and maintained along the trail adjacent to all mitigation areas to minimize intrusion and disturbance.

As part of the landscaping for this project, additional areas adjacent to the trail will be enhanced. Similar actions would be employed including invasive vegetation removal and planting with native species. Although some of these areas are within wetland or stream buffers and will improve the overall habitat within the trail corridor, they are not part of the compensatory mitigation.

Stream 0143D Vicinity (Stations 533+50 to 541+25)

Mitigation actions proposed in the vicinity of Stream 0143D include 0.49 acre of stream buffer enhancement and 0.05 acre of wetland buffer enhancement (Appendix E). These

enhancement areas are in the vicinity of the culvert mitigation (replacement for fish passage) that would occur at the trail crossing for Stream 0143D. Stream buffer enhancement is proposed within the buffer of Stream 0143D and Stream Unnamed 4—all located east of the trail. An additional 0.05 acre of wetland buffer enhancement is proposed at the north end of Wetland 32A, contiguous with the stream buffer enhancement. Proposed areas are dominated primarily by invasive species including Himalayan blackberry, Japanese knotweed, and reed canarygrass. These species will be controlled and native plants will be installed. Existing desirable vegetation will be protected where feasible. Habitat features, such as habitat logs and brush piles, will be added to the stream buffer and wetland buffer enhancement area. A dilapidated boardwalk crosses over Stream Unnamed 4, Wetland 32C, and associated buffers. This boardwalk would be removed as part of the enhancement activities.

Wetland B Vicinity (Stations 583+75 to 589+25)

Increased wetland buffer and shoreline setback enhancement are proposed in the vicinity of Wetland B (Appendix E). An area east of the trail would be added to the buffer of Wetland B and enhanced, providing additional protection and function to this lake fringe wetland. This 0.50-acre stretch has communities vegetated with both native and invasive species. Native vegetation communities consist of desirable trees and shrubs that are in good condition, currently supporting ecological functions. Dominant species include black cottonwood, bigleaf maple, beaked hazelnut, pacific ninebark, Nootka rose, snowberry, Indian plum, western swordfern, and California blackberry. Invasive plants (primarily Himalayan blackberry) occur in dense patches, as well as intermixed within the understory of the native vegetation. Enhancement would occur within a 0.03-acre portion of the shoreline setback west of the trail near Wetland C. This area is currently dominated by reed canarygrass and Himalayan blackberry. As part of the Sammamish Landing Park project, the City of Sammamish will be constructing dock and beach improvements this year. The proposed shoreline setback area will be cleared and used for staging for these improvements, then reseeded. Invasive plants in the increased wetland buffer and shoreline setback enhancement areas will be controlled, followed by native plant installation. Existing desirable vegetation will be protected where feasible.

5.3.3 Mitigation Goals, Objectives, and Performance Standards

The overall goal of the mitigation is to replace the habitats and functions lost as a result of the project. The proposed mitigation would accomplish this by replacing a fish barrier culvert on a Type F stream with a wider and shorter pipe that is fish passable, increasing the buffer of a lake fringe wetland by 0.50 acre, enhancing 0.05 acre of wetland buffer, enhancing 0.49 acre of stream buffer, and enhancing 0.03 acre of shoreline setback. Specific goals and objectives formulated to achieve this result are presented below.

Mitigation Goals

The mitigation goals are:

- Replace a fish barrier culvert and remove two fish barrier boulders on a Type F stream with a fish passable culvert.
- Increase and enhance the buffer of a lake fringe wetland by 0.50 acre.
- Enhance 0.05 acre of wetland buffer.
- Enhance 0.49 acre of stream buffer.
- Enhance 0.03 acre of shoreline setback.

Achievement of these goals is expected to provide the following improvements to stream, wetland buffer, stream buffer, and shoreline setback functions:

- Provide additional fish habitat by removing fish barriers, increasing open stream channel, and opening up available upstream habitat.
- Increase the production of organic matter by planting trees and shrubs in the increased wetland buffer, enhanced wetland buffer, enhanced stream buffer, and enhanced shoreline setback.
- Increase fish and wildlife habitat and improve biological diversity by planting with a variety of native wetland and buffer plant species and installing habitat features (habitat logs and brush piles).

Mitigation Objectives and Performance Standards

Instream Habitat

Objective 1: Replace existing perched culvert on Stream 0143D with fish passage culvert and remove two fish barrier boulders to open up available upstream habitat.

Performance Standards:

Year 1 and 2 Constructed habitat elements including the new fish passable culvert, regraded channel, and streambed material will remain in place as constructed.

Buffer Plant Communities

Objective 2: Establish a minimum of 0.55 acre forested wetland buffer, 0.49 acre forested stream buffer, and 0.03 acre forested shoreline setback at the increased wetland buffer, enhanced wetland buffer, enhanced stream buffer, and enhanced setback areas.

Performance Standards:

Year 1 Survival of planted woody species in enhanced wetland buffer, stream buffer, and shoreline setback areas will be at least 80 percent.

Year 3 Native woody species will achieve a minimum of 35 percent areal cover in the enhanced wetland buffer, stream buffer, and shoreline setback areas.

Year 5 Native woody species will achieve a minimum of 60 percent areal cover in the enhanced wetland buffer, stream buffer, and shoreline setback areas.

Objective 3: Limit invasive non-native species throughout the mitigation site planting areas.

Performance Standard:

Years 1–5 Himalayan blackberry, cutleaf blackberry, Scotch broom, English ivy, and reed canarygrass will not exceed 20 percent areal cover in all planting areas.

Year 3 100 percent removal of Japanese knotweed by Year 3 in the Stream 0143D vicinity mitigation area.

Objective 4: Document site development.

Performance Standard:

Permanent photographic stations will be established to monitor the development of the sites. Photographs will be taken along transect lines and from vantage points that capture the general mitigation area. All photographs will be labeled to identify locations.

Wildlife Habitat

Objective 5: Provide upland wildlife habitat.

Performance Standard:

- Years 1, 3, 5 Increase in areal cover of native woody species in the planted wetland buffer, stream buffer, and shoreline setback, as measured in Objectives 2 and 3, to be used as a surrogate to indicate increasing habitat functions.
- Year 5 Installed habitat features are present and functional.

Anthropogenic Disturbance

Objective 6: Protect the mitigation sites from anthropogenic disturbance.

Performance Standard:

- Years 1–5 Conduct qualitative monitoring to assess the status of the sites annually during the 5-year monitoring period to monitor for human disturbance, including but not limited to filling, trash, and vandalism.
- Years 1–5 Install and maintain fences and appropriate signs along the trail and adjacent to each site to identify their protected status.

6. MONITORING AND MAINTENANCE

6.1 MONITORING

The mitigation areas will be monitored during and after construction. During construction, monitoring will ensure that the BMPs are observed to minimize impacts, and the on-site construction work (including grading and planting) will be coordinated to ensure that the sites are constructed as designed.

After construction is completed, monitoring will be performed annually to ensure that the goals and objectives of the mitigation are being met. Monitoring of the mitigation areas will be performed over a 5-year period by a qualified professional (SMC 21A.50.145; 21A.50.300). A combination of quantitative and qualitative monitoring methods will be used to assess the management objectives and associated performance standards described in the mitigation plan. Activities will include site visits to monitor unnatural site disturbance, photographs to document site development, and data collection for the quantitative evaluation of performance standards. The results of the monitoring will be submitted to the permitting agencies.

Appropriate contingency measures will be developed, as needed, by a qualified professional to ensure that the sites develop healthy vegetation that meets the obligations described in this mitigation plan and the associated permits.

6.1.1 Quantitative Monitoring

The following bulleted items describe the methods to be used for the quantitative monitoring, monitoring schedule, and report deadlines.

- The enhancement sites will be assessed by an appropriate quantitative vegetative cover field assessment methodology. The line intercept method will be used for determining percent areal cover for woody and invasive species.
- Quantitative vegetation assessments will follow the same method in each consecutive monitoring year.
- Quantitative vegetation assessments will be performed between June 15 and September 15 of each monitoring year.
- Monitoring reports will be sent to agencies requiring monitoring reports by February 15 of the following year.
- Quantitative monitoring will include photographic documentation of the sites from permanent photograph stations.

6.1.2 Qualitative Monitoring

Qualitative monitoring will be conducted as follows:

- A qualified professional will qualitatively assess the constructed habitat elements including the new fish passable culvert, regraded channel, and streambed material for the first 2 years.
- Qualitative assessment will be performed yearly to visually assess the health of plants and identify areas that may need control of non-native invasive species or other maintenance activities.

6.2 MAINTENANCE

The proposed mitigation is intended to achieve the performance standards with minimal ongoing maintenance. However, King County will manage and maintain the site for 5 years, or until all performance standards are met and the site is closed with the approval of permitting agencies.

Planted vegetation species should be adapted to varying site conditions in the Puget Sound lowland, though supplemental irrigation may be needed during the first two growing seasons after installation to ensure the long-term survival of the plants. The need for irrigation will be evaluated based on the conditions observed during the establishment period.

To ensure rapid establishment of the plant community, trees and shrubs will be planted closer together than would generally occur in natural mature stands. Some natural mortality is expected to occur during the monitoring period. All dead and downed woody material will be left in place to provide microhabitats for wildlife. Plants will be replaced as needed to meet performance standards.

Maintenance to control nuisance species in the mitigation areas may be necessary. During the monitoring period, if it becomes evident that invasive species are impeding establishment of desirable native plants, measures will be implemented to control nuisance species. A progressively aggressive approach will be used to control nuisance species. Control measures will first include hand cutting and/or grubbing and removal; if this fails, an environmentally sensitive herbicide (e.g., Rodeo or equivalent) may be applied.

6.3 CONTINGENCY MEASURES

If monitoring indicates that the sites are not meeting performance standards, contingency measures will be implemented (Table 6-1). Site conditions will be evaluated to determine the cause of the problem and the most appropriate countermeasure.

Table 6-1. Contingency Measures for the Mitigation Sites

Problem	Contingency Measure
Less than 80% of planted woody species survive in Year 1	King County biologists (or other qualified biologist) will assess the sites to determine what conditions are preventing the plants from thriving. Appropriate measures will be taken to correct any conditions that are limiting growth. Lost plants will be replaced with appropriate native species unless appropriate native woody species are volunteering at a rate sufficient to replace them. Additional measures (such as providing additional protection) will be considered if necessary.
Percent cover for woody species not met during Years 3 or 5	King County biologists (or other qualified biologist) will assess the sites to determine what conditions are preventing the plants from thriving. Appropriate measures will be taken to correct any conditions that are limiting growth.
Invasive species exceed percent cover threshold	Implement/revise invasive species control plan.
Performance standards not met at Year 5	Continue the monitoring regime for 1 additional year. The sites will continue to be evaluated every year until it has met the stated performance standards associated with management objectives. Other contingency measures may be implemented during this period.

Information from the annual monitoring program will be used to identify any maintenance and/or corrective actions. If problems are identified in monitoring, King County biologists will determine the cause of the problem and implement proper maintenance or corrective activities. These activities will be discussed in the annual monitoring report.

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APPENDIX A

Wetland Determination Data Forms

Parametrix

Data Plot #: 31A-SP1
Wetland: 31A

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/14/2007
Applicant/Owner: King County County: King
Investigator: Erik Christensen, Mark Vlahakis State: WA
 1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 31A-SP1
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located 4 feet northwest of flag W31A-2.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>unkown ornamental</u>	<u>trace</u>		
✓ 2.	<u>Equisetum telmateia</u>	<u>30</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Phalaris arundinacea</u>	<u>60</u>	<u>Herb</u>	<u>FACW</u>
4.	<u>Solanum dulcamara</u>	<u>trace</u>	<u>Herb</u>	<u>FAC+</u>
5.	<u>Spiraea douglasii</u>	<u>trace</u>	<u>Shrub</u>	<u>FACW</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 3 (in.)
Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
X Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 31A-SP1

Wetland: 31A

Project/Site: ELST Re-delineation

Date: 11/14/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 15 to 30% slopes

Drainage Class: Moderately well drained

Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts

Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A	10YR 2/2	none	none	gravelly loam
10-14	B	10YR 5/1	7.5YR 4/4, 5GY 5/1		loam
14+	-	-	-	-	rock

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Listed on Hydric Soils List
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Fe/Mn Concretions
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic or Peraguic Moisture Regime	<input checked="" type="checkbox"/> Mottles (Redoximorphic Features)
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	
<input type="checkbox"/> High Organic Content in Surface Layer	

Remarks (Describe soil disturbances, local variations, etc.):

Low chroma soils and redoximorphic features indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?

Yes No

Is this Sampling Point Within a Wetland?

Hydric Soils Present?

Yes No

Yes No

Wetland Hydrology Present?

Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 31A-SP2
Wetland: Upland near 31A

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/14/2007
Applicant/Owner: King County County: King
Investigator: Erik Christensen, Mark Vlahakis State: WA

1987 Method 1997 WA St. Method
Community ID: Upland Shrubs
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 31A-SP2
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located 8 feet northeast of flag W31A-2.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
✓ 1.	<u>bare ground</u>	<u>20</u>	<u> </u>	<u> </u>
2.	<u>Equisetum telmateia</u>	<u>10</u>	<u>Herb</u>	<u>FACW</u>
3.	<u>Geranium robertianum</u>	<u>trace</u>	<u>Herb</u>	<u>NL</u>
4.	<u>Phalaris arundinacea</u>	<u>5</u>	<u>Herb</u>	<u>FACW</u>
✓ 5.	<u>Polystichum munitum</u>	<u>20</u>	<u>Herb</u>	<u>FACU</u>
✓ 6.	<u>Rubus spectabilis</u>	<u>20</u>	<u>Shrub</u>	<u>FAC+</u>
✓ 7.	<u>Rubus ursinus</u>	<u>20</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 33

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant species that are hydrophytic is not greater than 50 percent. Hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):
 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:
 Inundated
 Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
No indicators of wetland hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 31A-SP2
Wetland: Upland near 31A

Project/Site: ELST Re-delineation Date: 11/14/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	10YR 3/3	none	none	gravelly sandy loam, 20% gravel
12-16	A2	10YR 3/3	none	none	loamy sand

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
No indicators of hydric soil are present. Hydric soil criterion is not satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are not met. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 31B-SP1
Wetland: 31B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 6/16/2008
Applicant/Owner: King County County: King
Investigator: Erik Christensen State: WA

1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 31B-SP1
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located in the middle of the wetland approximately 12' east of the split rail fence.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Equisetum telmateia</u>	<u>10</u>	<u>Herb</u>	<u>FACW</u>
✓ 2.	<u>Glyceria striata</u>	<u>90</u>	<u>Herb</u>	<u>OBL</u>
3.	<u>Rubus armeniacus</u>	<u>10</u>	<u>Shrub</u>	<u>FACU</u>
✓ 4.	<u>Rubus spectabilis</u>	<u>30</u>	<u>Shrub</u>	<u>FAC+</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
Acer macrophyllum was rooted outside of the wetland, but was overhanging to provide 80% cover. The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 2 (in.)
Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
X Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
Standing water was observed directly adjacent to the soil pit. Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 31B-SP1
Wetland: 31B

Project/Site: ELST Re-delineation Date: 6/16/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-14	A	10YR 2/1	none	none	mucky silt loam
14-16	A2	10YR 2/1	none	none	mucky gravelly silt loam

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input checked="" type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

Soil was saturated and created a slurry in the soil pit. The soil profile was difficult to examine. Low chroma soil matrix indicates hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 31B-SP2
Wetland: Upland near 31B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 6/16/2008
Applicant/Owner: King County County: King
Investigator: Erik Christensen State: WA
 1987 Method 1997 WA St. Method Community ID: Upland Forest
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 31B-SP2
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located approximately 10' east of SP1.

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Polystichum munitum</u>	<u>25</u>	<u>Herb</u>	<u>FACU</u>
✓ 2. <u>Rubus armeniacus</u>	<u>25</u>	<u>Shrub</u>	<u>FACU</u>
3. <u>Rubus spectabilis</u>	<u>10</u>	<u>Shrub</u>	<u>FAC+</u>
✓ 4. <u>Acer macrophyllum</u>	<u>90</u>	<u>Tree</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 0

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant vegetation that is hydrophytic is not greater than 50%. Therefore, hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
_____ Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
No indicators of wetland hydrology were present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 31B-SP2
Wetland: Upland near 31B

Project/Site: ELST Re-delineation Date: 6/16/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-6	A	10YR 3/1	none	none	gravelly loam
6-14	B	10YR 3/3	none	none	gravelly sandy loam

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

An organic duff later consisting of leaf litter is abundant throughout the upland. No indicators of hydric soil were present. Hydric soil criterion is not satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Hydrophytic vegetation, wetland hydrology, and hydric soil criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 31C-SP1
Wetland: 31C

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/13/2007
Applicant/Owner: King County County: King
Investigator: T. Farrelly, C. Maney State: WA

1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 31C-SP1
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located halfway between flags 1 and 4 along the toe of slope, 8 feet from the split-rail. A cluster of Acer sp. are growing directly upslope.

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Equisetum telmateia</u>	<u>30</u>	<u>Herb</u>	<u>FACW</u>
✓ 2. <u>Phalaris arundinacea</u>	<u>40</u>	<u>Herb</u>	<u>FACW</u>
3. <u>Solanum dulcamara</u>	<u>15</u>	<u>Herb</u>	<u>FAC+</u>
4. <u>Rubus armeniacus</u>	<u>10</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 4 (in.)
Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
X Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 31C-SP1
Wetland: 31C

Project/Site: ELST Re-delineation Date: 11/13/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4	A	10YR 2/1	none	none	silt loam
4-18	B	10YR 4/1	none	none	gravely sandy loam

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low chroma soil matrix colors indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 31C-SP2
Wetland: Upland near 31C

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/13/2007
Applicant/Owner: King County County: King
Investigator: C. Maney, T. Farrelly State: WA
 1987 Method 1997 WA St. Method Community ID: Upland Forest
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 31C-SP2
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located northeast of sample plot W31C-SP1 between flags 2 and 3, upslope from the wetland.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Equisetum telmateia</u>	<u>15</u>	<u>Herb</u>	<u>FACW</u>
2.	<u>Holodiscus discolor</u>	<u>10</u>	<u>Shrub</u>	<u>NL</u>
✓ 3.	<u>Rubus armeniacus</u>	<u>35</u>	<u>Shrub</u>	<u>FACU</u>
✓ 4.	<u>Rubus ursinus</u>	<u>20</u>	<u>Shrub</u>	<u>FACU</u>
✓ 5.	<u>Acer macrophyllum</u>	<u>60</u>	<u>Tree</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 25

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is not greater than 50 percent. Hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

No indicators of wetland hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 31C-SP2
Wetland: Upland near 31C

Project/Site: ELST Re-delineation Date: 11/13/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8	A	10YR 2/2	none	none	gravelly loam
8-18	B	2.5Y 5/3	none	none	gravelly loam

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
No indicators of hydric soil are present. Hydric soil criterion is not satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are not met. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 31E-SP1
 Wetland: 31E

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/8/2007
 Applicant/Owner: King County County: King County
 Investigator: Michael Muscari/Rachel Hulscher State: WA
 1987 Method 1997 WA St. Method Community ID: PSS/PFO
 Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 31E-SP1
 Is the site significantly disturbed (Atypical Situation)? Yes No X
 Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located approximately 2 feet southwest of Flag 31E-2.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Athyrium filix-femina ladyfern</u>	<u>5</u>	<u>Herb</u>	<u>FAC</u>
2.	<u>Equisetum telmateia</u>	<u>10</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Cornus sericea</u>	<u>20</u>	<u>Shrub</u>	<u>FACW</u>
✓ 4.	<u>Corylus cornuta</u>	<u>30</u>	<u>Shrub</u>	<u>FACU</u>
✓ 5.	<u>Rubus armeniacus</u>	<u>60</u>	<u>Shrub</u>	<u>FACU</u>
✓ 6.	<u>Rubus ursinus</u>	<u>40</u>	<u>Shrub</u>	<u>FACU</u>
7.	<u>Fraxinus latifolia</u>	<u>10</u>	<u>Tree</u>	<u>FACW</u>
✓ 8.	<u>Populus balsamifera</u>	<u>30</u>	<u>Tree</u>	<u>FAC</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 67

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
Hydrophytic vegetation is dominant but is disturbed - lawn refuse piles & Himalayan blackberry have altered the vegetation here. Hydrophytic vegetation generally follows the stream channel to Lake Sammamish (stream forks & then fans out at shoreline). 67 percent of the dominate vegetation is hydrophytic. Therefore, hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):
 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
 X No Recorded Data Available

Wetland Hydrology Indicators (Describe in Remarks):
 Primary Indicators:
 Inundated
 X Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: none (in.)
 Depth to Free Water in Pit: none (in.)
 Depth to Saturated Soil: 11 (in.)

Secondary Indicators (2 or more required):
 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
Stream tributary D143J splits upslope and settles at toe of slope; very wet in gravel layer but not saturated. Soil saturation in the upper 12 inches satisfies wetland soil criterion.

Parametrix

Data Plot #: 31E-SP1
Wetland: 31E

Project/Site: ELST Re-delineation Date: 11/8/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4	A	10YR 2/1	none	none	silt loam mucky
4-11	B	10YR 3/1	none	none	gravelly sandy
11-16		2.5Y 5/1	none	none	loam

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input checked="" type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguic Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low-chroma soil matrix colors satisfy hydric soil criterion.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 31E-SP2
Wetland: Upland near 31E

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/8/2007
Applicant/Owner: King County County: King County
Investigator: Michael Muscari/Rachel Hulscher State: WA
 1987 Method 1997 WA St. Method
Community ID: Upland Shrub
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 31E-SP2
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):
The sample plot is located approximately 2 feet northeast of Flag 31E-2.

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Corylus cornuta</u>	<u>40</u>	<u>Shrub</u>	<u>FACU</u>
✓ 2. <u>Rubus armeniacus</u>	<u>40</u>	<u>Shrub</u>	<u>FACU</u>
3. <u>Rubus spectabilis</u>	<u>5</u>	<u>Shrub</u>	<u>FAC+</u>
4. <u>Populus balsamifera</u>	<u>5</u>	<u>Tree</u>	<u>FAC</u>
5. <u>Thuja plicata (planted)</u>	<u>2</u>	<u>Tree</u>	<u>FAC</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 50

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant species that are hydrophytic is not greater than 50 percent. Hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
 X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
Upslope from tributary fork; no saturation; soils moist but not saturated. No primary or secondary indicators of hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 31E-SP2
Wetland: Upland near 31E

Project/Site: ELST Re-delineation Date: 11/8/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8	A	10YR 2/2	none	none	loam
8-16	A2	10YR 2/1	none	none	sandy loam

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low chroma soil matrix color satisfy hydric soil criterion.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Hydrophytic vegetation and hydrology criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32A-SP1
Wetland: 32A

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: Erik Christensen, Colin Worsley State: WA

1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 32A-SP1
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located at the southwest corner of the wetland approximately 10 feet north of flag W32A-13 and 6 feet northeast from the fence.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Convolvulus arvensis</u>	<u>trace</u>	<u>Herb</u>	<u>NL</u>
✓ 2.	<u>Phalaris arundinacea</u>	<u>90</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Physocarpus capitatus</u>	<u>25</u>	<u>Shrub</u>	<u>FACW-</u>
✓ 4.	<u>Rubus armeniacus</u>	<u>25</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 67

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

This sample plot is located at the edge of the Rubus armeniacus/Physocarpus capitatus community. Greater than 50% of dominant vegetation is hydrophytic. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

Stream, Lake, or Tide Gage

Aerial Photograph

Other
X
No Recorded Data Available

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

Inundated
X
Saturated in Upper 12 inches

Water Marks

Drift Lines

Sediment Deposits

Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

Oxidized Rhizospheres in Upper 12 inches

Water-Stained Leaves

Local Soil Survey Data

Other (Explain in Remarks)

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: surface (in.)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

This sample plot is adjacent to Tributary #0143E. Flowing water was present at the time of the site visit. Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 32A-SP1
Wetland: 32A

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-9	A	10YR 3/1	none	none	silt loam
9-16	B	5Y 2/1	none	none	sandy loam

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low soil chroma indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 32A-SP2
Wetland: Upland near 32A

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: Erik Christensen, Colin Worsley State: WA

1987 Method 1997 WA St. Method
Do Normal Circumstances exist on the site? Yes X No _____
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Community ID: Upland Shrub
Field Plot ID: 32A-SP2

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located south of the wetland approximately 12' east of flay 32A-13, between the trail and the parkway.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Equisetum telmateia</u>	<u>10</u>	<u>Herb</u>	<u>FACW</u>
✓ 2.	<u>Phalaris arundinacea</u>	<u>90</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Rubus armeniacus</u>	<u>60</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 50

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is not greater than 50 percent. Hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
X No Recorded Data Available

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
_____ Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

No indicators of wetland hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 32A-SP2
Wetland: Upland near 32A

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	10YR 3/1	none	none	gravelly sandy loam
12-16+	B	10YR 4/2	7.5YR 4/6	common, medium	sand

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low-chroma soil matrix color indicates hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Only the wetland soil criterion is met. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32A-SP3
Wetland: Upland near 32A

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: Erik Christensen, Colin Worsley State: WA

1987 Method 1997 WA St. Method
Do Normal Circumstances exist on the site? Yes X No _____
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Community ID: Upland Shrub
Field Plot ID: 32A-SP3

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located north of Wetland 32A in a Populus balsamifera community. The plot is located approximately 15 feet northeast of the fence and 20 feet north of flag 32A-8, and 25 feet northwest of a large Populus balsamifera.

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Populus balsamifera</u>	<u>100</u>	<u>Shrub</u>	<u>FAC</u>
2. <u>Symphoricarpos albus</u>	<u>10</u>	<u>Shrub</u>	<u>FACU</u>
✓ 3. <u>Populus balsamifera</u>	<u>20</u>	<u>Tree</u>	<u>FAC</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant species that are hydrophytic is not greater than 50 percent. Hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

Stream, Lake, or Tide Gage

Aerial Photograph

Other
X
No Recorded Data Available

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

Inundated

Saturated in Upper 12 inches

Water Marks

Drift Lines

Sediment Deposits

Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Secondary Indicators (2 or more required):

Oxidized Rhizospheres in Upper 12 inches

Water-Stained Leaves

Local Soil Survey Data

Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
No indicators of wetland hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 32A-SP3
Wetland: Upland near 32A

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-18	A	10YR 3/1	none	none	loam

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low-chroma soil matrix color indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland hydrology criterion is not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32A-SP4
Wetland: 32A

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: Erik Christense, Colin Worsley State: WA
 1987 Method 1997 WA St. Method Community ID: PFO
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 32A-SP4
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located in the northern portion of the wetland approximately 10 feet east of the fence in a forested community. The sample plot is located approximately 21 feet from flag 32A-10 at 122 degrees.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Carex obnupta</u>	<u>15</u>	<u>Herb</u>	<u>OBL</u>
✓ 2.	<u>Phalaris arundinacea</u>	<u>40</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Rosa pisocarpa</u>	<u>20</u>	<u>Shrub</u>	<u>FAC</u>
✓ 4.	<u>Rubus armeniacus</u>	<u>40</u>	<u>Shrub</u>	<u>FACU</u>
✓ 5.	<u>Symphoricarpos albus</u>	<u>25</u>	<u>Shrub</u>	<u>FACU</u>
✓ 6.	<u>Fraxinus latifolia</u>	<u>90</u>	<u>Tree</u>	<u>FACW</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 60

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 3 (in.)
Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
X Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 32A-SP4
Wetland: 32A

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-17	A	10YR 2/1	none	none	mucky loam

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Low soil chroma indicates hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 32B-SP1
Wetland: 32B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: Erik Christensen, Colin Worsley State: WA
 1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 32B-SP1
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located at the southwest corner of the wetland approximately 6 feet north of flag W32B-01 and 10 feet east of the fence.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Agrostis spp.</u>	<u>10</u>	<u>Herb</u>	<u> </u>
2.	<u>Equisetum telmateia</u>	<u>15</u>	<u>Herb</u>	<u>FACW</u>
3.	<u>Festuca rubra</u>	<u>15</u>	<u>Herb</u>	<u>FAC</u>
4.	<u>Juncus effusus</u>	<u>2</u>	<u>Herb</u>	<u>FACW+</u>
✓ 5.	<u>Phalaris arundinacea</u>	<u>60</u>	<u>Herb</u>	<u>FACW</u>
6.	<u>Rubus laciniatus</u>	<u>trace</u>	<u>Shrub</u>	<u>FACU+</u>
7.	<u>Rubus parviflorus</u>	<u>5</u>	<u>Shrub</u>	<u>FAC-</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
X No Recorded Data Available

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:
 Inundated
X Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 18 (in.)
Depth to Saturated Soil: 6 (in.)

Secondary Indicators (2 or more required):
 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 32B-SP1
Wetland: 32B

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8	A	10YR 3/2	none	none	loam
8-18	B	2.5Y 4/2	5YR 4/6	many, medium	sandy loam

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input checked="" type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

Soil chroma of 2 and redoximorphic features indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 32B-SP2
Wetland: Upland near 32B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: E. Christensen, C. Worsley State: WA
 1987 Method 1997 WA St. Method Community ID: Upland Shrubs and Forbs
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 32B-SP2
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located south of Wetland 32B, approximately 2 feet south of Flag 32B-1.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Agrostis sp.</u>	<u>10</u>	<u>Herb</u>	<u>FAC</u>
2.	<u>Dactylis glomerata</u>	<u>10</u>	<u>Herb</u>	<u>FACU</u>
3.	<u>Equisetum telmateia</u>	<u>5</u>	<u>Herb</u>	<u>FACW</u>
✓ 4.	<u>Phalaris arundinacea</u>	<u>80</u>	<u>Herb</u>	<u>FACW</u>
✓ 5.	<u>Rubus armeniacus</u>	<u>30</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 50

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant vegetation that is hydrophytic is not greater than 50%. Therefore, hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: None (in.)
Depth to Free Water in Pit: None (in.)
Depth to Saturated Soil: None (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

No primary or secondary indicators of hydrology were present, therefore the wetland hydrology criterion is not met.

Parametrix

Data Plot #: 32B-SP2
Wetland: Upland near 32B

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-12	A	10YR 3/2	-	-	loam
12-18	B	2.5Y 3/2	2.5YR 4/6	common/medium/prominent	silt loam

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input checked="" type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

Oxidized root channels observed in soil. Low chroma soil matrix with redoximorphic features indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Hydrophytic vegetation and wetland hydrology criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32B-SP3
Wetland: Upland near 32B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: C. Worsley, E. Christensen State: WA
 1987 Method 1997 WA St. Method Community ID: Upland Shrub
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 32B-SP3
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located on the slope ESE of the wetland, approximately 20 feet south west of East Lake Sammamish Parkway.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Polystichum munitum</u>	<u>Trace</u>	<u>Herb</u>	<u>FACU</u>
✓ 2.	<u>Physocarpus capitatus</u>	<u>90</u>	<u>Shrub</u>	<u>FACW-</u>
3.	<u>Rubus armeniacus</u>	<u>5</u>	<u>Shrub</u>	<u>FACU</u>
✓ 4.	<u>Rubus laciniatus</u>	<u>40</u>	<u>Shrub</u>	<u>FACU+</u>
5.	<u>Rubus parviflorus</u>	<u>5</u>	<u>Shrub</u>	<u>FAC-</u>
6.	<u>Rubus ursinus</u>	<u>Trace</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 50

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant vegetation that is hydrophytic is not greater than 50%. Therefore, hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
_____ No Recorded Data Available

Field Observations:

Depth of Surface Water: None (in.)
Depth to Free Water in Pit: None (in.)
Depth to Saturated Soil: None (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
_____ Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

No primary or secondary indicators of hydrology were present, therefore the wetland hydrology criterion is not met.

Parametrix

Data Plot #: 32B-SP3
Wetland: Upland near 32B

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Listed on Hydric Soils List
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Fe/Mn Concretions
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic or Peraquic Moisture Regime	<input type="checkbox"/> Mottles (Redoximorphic Features)
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Gleyed or Low-Chroma Colors	
<input type="checkbox"/> High Organic Content in Surface Layer	

Remarks (Describe soil disturbances, local variations, etc.):

Low chroma soil matrix with redoximorphic features indicate hydric soils. Hydric soil criterion is satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Is this Sampling Point Within a Wetland?
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	

Remarks

Hydrophytic vegetation and wetland hydrology criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32B-SP4
Wetland: Upland near 32B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 3/13/2008
Applicant/Owner: King County County: King
Investigator: C. Worsley, M. Maynard State: WA

1987 Method 1997 WA St. Method Community ID: Upland Shrub
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 32B-SP4
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located approximately 4 feet east of Flag 32B-9 and approximately 20 feet northeast of fence.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Athyrium filix-femina</u>	<u>Trace</u>	<u></u>	<u>FAC</u>
2.	<u>Phalaris arundinacea</u>	<u>15</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Fraxinus latifolia</u>	<u>20</u>	<u>Shrub</u>	<u>FACW</u>
✓ 4.	<u>Physocarpus capitatus</u>	<u>60</u>	<u>Shrub</u>	<u>FACW-</u>
✓ 5.	<u>Rosa pisocarpa</u>	<u>25</u>	<u>Shrub</u>	<u>FAC</u>
6.	<u>Rubus armeniacus</u>	<u>8</u>	<u>Shrub</u>	<u>FACU</u>
✓ 7.	<u>Alnus rubra</u>	<u>20</u>	<u>Tree</u>	<u>FAC</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant vegetation that is hydrophytic is greater than 50%. Therefore, hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

Stream, Lake, or Tide Gage

Aerial Photograph

Other
X No Recorded Data Available

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

Inundated
X Saturated in Upper 12 inches

Water Marks

Drift Lines

Sediment Deposits

Drainage Patterns in Wetlands

Field Observations:

Depth of Surface Water: None (in.)
Depth to Free Water in Pit: 15 (in.)
Depth to Saturated Soil: 9 (in.)

Secondary Indicators (2 or more required):

Oxidized Rhizospheres in Upper 12 inches

Water-Stained Leaves

Local Soil Survey Data

Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
Saturation in the upper 12 inches satisfies the wetland hydrology criterion.

Parametrix

Data Plot #: 32B-SP4
Wetland: Upland near 32B

Project/Site: ELST Re-delineation Date: 3/13/2008

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-3	A	10YR 3/2	-	-	loam
3-7	B1	10YR 4/2	-	-	sandy loam
7-12	B2	2.5Y 4/2	-	-	sand
12-16		5Y 3/2	2.5YR 3/6	many/fine/prominent	silt loam

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguic Moisture Regime | <input checked="" type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

Hydric soil criterion is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Hydric soil criterion is not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32C-SP1
Wetland: 32C

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/15/2007
Applicant/Owner: King County County: King County
Investigator: Mark Vlahakis State: WA

1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 32C-SP1
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):
This sample plot is located a few feet north of flag W32C-1

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Phalaris arundinacea</u>	<u>90</u>	<u>Herb</u>	<u>FACW</u>
2. <u>Rubus armeniacus</u>	<u>10</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
 X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: surface (in.)
Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 X Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
Saturation in the upper 12 inches satisfies wetland hydrology criterion. Sidewall seeps begin at 4" below the ground surface. Ponded water (~1") located 4' east at the bottom of the swale.

Parametrix

Data Plot #: 32C-SP1
Wetland: 32C

Project/Site: ELST Re-delineation Date: 11/15/2007

SOIL

Soil Survey Data:

Map Unit Name: Alderwood gravelly sandy loam, 6 to 15 % slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Durochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-4	A	10YR 4/1	none	none	silty fine sand
4-12	A2	10YR 4/1	7.5YR 4/6	common, fine, distinct	silty fine sand
12+	A3	10YR 3/1	7.5YR 4/1	common, fine, distinct	loamy fine sand

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Listed on Hydric Soils List
<input type="checkbox"/> Histic Epipedon	<input checked="" type="checkbox"/> Fe/Mn Concretions
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic or Peraguic Moisture Regime	<input type="checkbox"/> Mottles (Redoximorphic Features)
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Other (Explain in Remarks)
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	
<input type="checkbox"/> High Organic Content in Surface Layer	

Remarks (Describe soil disturbances, local variations, etc.):

Some gley (4/5g) below 12". Low-chroma soil matrix color and redoximorphic features indicate hydric soils. The hydric soil criterion is met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Is this Sampling Point Within a Wetland?
Hydric Soils Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 32C-SP2
Wetland: Upland near 32C

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/15/2007
Applicant/Owner: King County County: King County
Investigator: Mark Vlahakis State: WA

1987 Method 1997 WA St. Method Community ID: Upland Herb
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 32C-SP2
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):
This data plot is located approximately 6 inches higher and 4 feet west of W32-C plot 1.

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Phalaris arundinacea</u>	<u>50</u>	<u>H</u>	<u>FACW</u>
✓ 2. <u>Poa pratensis</u>	<u>25</u>	<u>H</u>	<u>FAC</u>
✓ 3. <u>Rubus armeniacus</u>	<u>20</u>	<u>S</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 67

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):
The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
 X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):
No indicators of wetland hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 32C-SP2
Wetland: Upland near 32C

Project/Site: ELST Re-delineation Date: 11/15/2007

SOIL

Soil Survey Data:

Map Unit Name: Kitsap Silt Loam 2 to 8% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Dystric Xerochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-10	A	10YR 3/3	none	none	silty sand
10-16+	B	10YR 3/2	none	none	fine sandy silt

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

No hydric soil indicators are present. Hydric soil criterion is not met.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Hydric soil and hydrology criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 32C-SP3
Wetland: Upland near 32C

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/15/2007
Applicant/Owner: King County County: King
Investigator: Mark Vlahakis State: WA
 1987 Method 1977 WA St. Method Community ID: Upland Herb
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 32C-SP3
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located at the beginning (south end) of the upland berm/fill area at the north end of wetland 32C.

VEGETATION (✓ Dominant species are checked)

Plant Species	% Cover	Stratum	Indicator
✓ 1. <u>Phalaris arundinacea</u>	<u>75</u>	<u>Herb</u>	<u>FACW</u>
✓ 2. <u>Poa pratensis</u>	<u>20</u>	<u>Herb</u>	<u>FAC</u>
3. <u>Rosa nutkana</u>	<u>trace</u>	<u>Shrub</u>	<u>FAC</u>
4. <u>Symphoricarpos albus</u>	<u>trace</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: none (in.)
Depth to Saturated Soil: none (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Soil is moist only to 16+ inches. No primary or secondary indicators of hydrology are present. Wetland hydrology criterion is not satisfied.

Parametrix

Data Plot #: 32C-SP3
Wetland: Upland near 32C

Project/Site: ELST Re-delineation Date: 11/15/2007

SOIL

Soil Survey Data:

Map Unit Name: Alderwood and Kitsap Soils Drainage Class: Varies
Field Observations Confirm Mapped Type?
Taxonomy (Subgroup): N/A Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-2	A	10YR 3/2	none	none	silt loam
2-8	B	10YR 3/1, 10YR 4/1	none	none	sand
8-14	B2	10YR 3/2	none	none	silty fine sand
14*16+	C	10YR 5/1	7.5YR 4/4, 7.5YR 4/6	common, fine, distinct	silt loam

Hydric Soil Indicators:

- | | |
|---|---|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguic Moisture Regime | <input type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):

Redoximorphic features are present below 14 inches. Silt loam below 14 inches has more clay content than the 0-2" layer. No hydric soil indicators are present in the upper 12 inches of the soil profile.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Hydrophytic vegetation, hydric soil, and wetland hydrology criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

Parametrix

Data Plot #: 33B-SP1
Wetland: 33B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/15/2007
Applicant/Owner: King County County: King
Investigator: Mark Vlahakis State: WA
 1987 Method 1997 WA St. Method Community ID: PEM
Do Normal Circumstances exist on the site? Yes X No _____ Field Plot ID: 33B-SP1
Is the site significantly disturbed (Atypical Situation)? Yes _____ No X
Is the area a potential Problem Area? Yes _____ No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located in the lowest elevation at the head of the wetland area. A dry ditch channel continues upstream.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
✓ 1.	<u>Equisetum arvense</u>	<u>20</u>	<u>Herb</u>	<u>FAC</u>
✓ 2.	<u>Phalaris arundinacea</u>	<u>70</u>	<u>Herb</u>	<u>FACW</u>
3.	<u>Poa pratensis</u>	<u>10</u>	<u>Herb</u>	<u>FAC</u>
4.	<u>Rubus armeniacus</u>	<u>10</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 100

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is greater than 50 percent. Hydrophytic vegetation criterion is satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

_____ Stream, Lake, or Tide Gage
_____ Aerial Photograph
_____ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 8 (in.)
Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

_____ Inundated
X Saturated in Upper 12 inches
_____ Water Marks
_____ Drift Lines
_____ Sediment Deposits
_____ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

_____ Oxidized Rhizospheres in Upper 12 inches
_____ Water-Stained Leaves
_____ Local Soil Survey Data
_____ Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 33B-SP1
Wetland: 33B

Project/Site: ELST Re-delineation Date: 11/15/2007

SOIL

Soil Survey Data:

Map Unit Name: Alderwood gravelly sandy loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Entic Durochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-8	A	10YR 2/2	7.5YR 4/4	common, distinct	fine sandy loam
8-16	B	10YR 3/2	7.5YR 4/6	common, distinct	silt loam

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histosol | <input type="checkbox"/> Listed on Hydric Soils List |
| <input type="checkbox"/> Histic Epipedon | <input type="checkbox"/> Fe/Mn Concretions |
| <input type="checkbox"/> Sulfidic Odor | <input type="checkbox"/> Organic Streaking in Sandy Soils |
| <input type="checkbox"/> Aquic or Peraguc Moisture Regime | <input checked="" type="checkbox"/> Mottles (Redoximorphic Features) |
| <input type="checkbox"/> Reducing Conditions | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Gleyed or Low-Chroma Colors | |
| <input type="checkbox"/> High Organic Content in Surface Layer | |

Remarks (Describe soil disturbances, local variations, etc.):
Chroma 2 soil with redoximorphic features indicate hydric soils.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks

Wetland vegetation, hydrology, and soil criteria are met. Therefore, the sample plot is located in a wetland.

Parametrix

Data Plot #: 33B-SP2
Wetland: Upland near 33B

WETLAND DETERMINATION (Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation Date: 11/15/2007
Applicant/Owner: King County County: King
Investigator: Mark Vlahakis State: WA
 1987 Method 1997 WA St. Method Community ID: Upland Herb/Shrub
Do Normal Circumstances exist on the site? Yes X No Field Plot ID: 33B-SP2
Is the site significantly disturbed (Atypical Situation)? Yes No X
Is the area a potential Problem Area? Yes No X

Remarks (Explain sample location, disturbances, problem areas):

This sample plot is located upslope of plot 1 about 3 feet east and 1 foot higher in elevation. A blackberry thicket is above.

VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	<u>Equisetum arvense</u>	<u>10</u>	<u>Herb</u>	<u>FAC</u>
✓ 2.	<u>Phalaris arundinacea</u>	<u>40</u>	<u>Herb</u>	<u>FACW</u>
✓ 3.	<u>Rubus armeniacus</u>	<u>40</u>	<u>Shrub</u>	<u>FACU</u>

Percent of **Dominant Species** that are OBL, FACW, or FAC (except FAC-). Include species noted (*) as showing morphological adaptations to wetlands. "T" indicates trace. 50

Remarks (Describe disturbances, relevant local variations, seasonal effects, etc.):

The percent of dominant species that are hydrophytic is not greater than 50 percent. Hydrophytic vegetation criterion is not satisfied.

HYDROLOGY

Recorded Data (Describe in Remarks):

 Stream, Lake, or Tide Gage
 Aerial Photograph
 Other
 X No Recorded Data Available

Field Observations:

Depth of Surface Water: none (in.)
Depth to Free Water in Pit: 15 (in.)
Depth to Saturated Soil: 12 (in.)

Wetland Hydrology Indicators (Describe in Remarks):

Primary Indicators:

 Inundated
 X Saturated in Upper 12 inches
 Water Marks
 Drift Lines
 Sediment Deposits
 Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):

 Oxidized Rhizospheres in Upper 12 inches
 Water-Stained Leaves
 Local Soil Survey Data
 Other (Explain in Remarks)

Remarks (As relevant, describe recent precipitation, hydrologic modifications, local variations, etc.):

Saturation in the upper 12 inches satisfies wetland hydrology criterion.

Parametrix

Data Plot #: 33B-SP2
Wetland: Upland near 33B

Project/Site: ELST Re-delineation Date: 11/15/2007

SOIL

Soil Survey Data:

Map Unit Name: Alderwood gravelly sandy loam 15 to 30% slopes Drainage Class: Moderately well drained
Field Observations Confirm Mapped Type?

Taxonomy (Subgroup): Entic Durochrepts Yes No NA

Profile Description:

Depth (Inches)	Horizon Designation	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Rhizospheres, etc.
0-6	A	10YR 2/2	none	none	sandy loam
6-14	A2	10YR 2/2	none	none	silty sand
14-16+	B	10YR 4/2	10YR 4/4	fine, distinct, few	gravelly loamy sand

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Listed on Hydric Soils List
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> Fe/Mn Concretions
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic or Peraguic Moisture Regime	<input type="checkbox"/> Mottles (Redoximorphic Features)
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Gleyed or Low-Chroma Colors	
<input type="checkbox"/> High Organic Content in Surface Layer	

Remarks (Describe soil disturbances, local variations, etc.):
No hydric soil indicators are present. Hydric soil criterion is not satisfied.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes No Is this Sampling Point Within a Wetland?
Hydric Soils Present? Yes No Yes No
Wetland Hydrology Present? Yes No

Remarks
Hydric soil criteria is not satisfied. The sample plot is not located in a wetland.

APPENDIX B
Wetland Rating Forms

Wetland name or number 31A

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 31A Date of site visit: 5-15-07
11-14-07

Rated by Erik Christensen Trained by Ecology? Yes ___ No Date of training

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size 0.03 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III IV ___

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

Score for Water Quality Functions	<u>22</u>
Score for Hydrologic Functions	<u>8</u>
Score for Habitat Functions	<u>9</u>
TOTAL score for Functions	<u>39</u>

Category based on SPECIAL CHARACTERISTICS 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	<input checked="" type="checkbox"/>
Natural Heritage Wetland	Riverine	<input type="checkbox"/>
Bog	Lake-fringe	<input type="checkbox"/>
Mature Forest	Slope	<input type="checkbox"/>
Old Growth Forest	Flats	<input type="checkbox"/>
Coastal Lagoon	Freshwater Tidal	<input type="checkbox"/>
Interdunal		<input type="checkbox"/>
None of the above	Check if unit has multiple HGM classes present	<input checked="" type="checkbox"/>

D Depressional and Flats Wetlands		Points (only 1 score per box)
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		
D	D 1. Does the wetland unit have the <u>potential</u> to improve water quality?	(see p.38)
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p>	Figure <u>2</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = 0</p>	<u>0</u>
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation $\geq 95\%$ of area points = 5</p> <p>Wetland has persistent, ungrazed, vegetation $\geq 1/2$ of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation $\geq 1/10$ of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation $< 1/10$ of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p>	Figure <u>5</u>
D	<p>D 1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is $> 1/2$ total area of wetland points = 4</p> <p>Area seasonally ponded is $> 1/4$ total area of wetland points = 2</p> <p>Area seasonally ponded is $< 1/4$ total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p>	Figure <u>4</u>
D	Total for D 1	<i>Add the points in the boxes above</i> <u>11</u>
D	<p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>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. <i>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.</i></p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen Other _____ <p><input checked="" type="checkbox"/> YES multiplier is 2 NO multiplier is 1</p>	(see p. 44) multiplier <u>2</u>
D	TOTAL - Water Quality Functions	Multiply the score from D1 by D2 <i>Add score to table on p. 1</i> <u>22</u>

D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	<i>(see p. 46)</i>
D	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 <i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0	2
D	D 3.2 Depth of storage during wet periods <i>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).</i> Marks of ponding are 3 ft or more above the surface or bottom of 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 Unit 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	D 3.3 Contribution of wetland unit to storage in the watershed <i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i> 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
D	Total for D 3 <i>Add the points in the boxes above</i>	8
D	D 4. Does the wetland unit 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. <i>Note which of the following indicators of opportunity apply.</i> — 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 <u>NO</u> multiplier is 1	<i>(see p. 49)</i> multiplier 1
D	TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4 <i>Add score to table on p. 1</i>	8

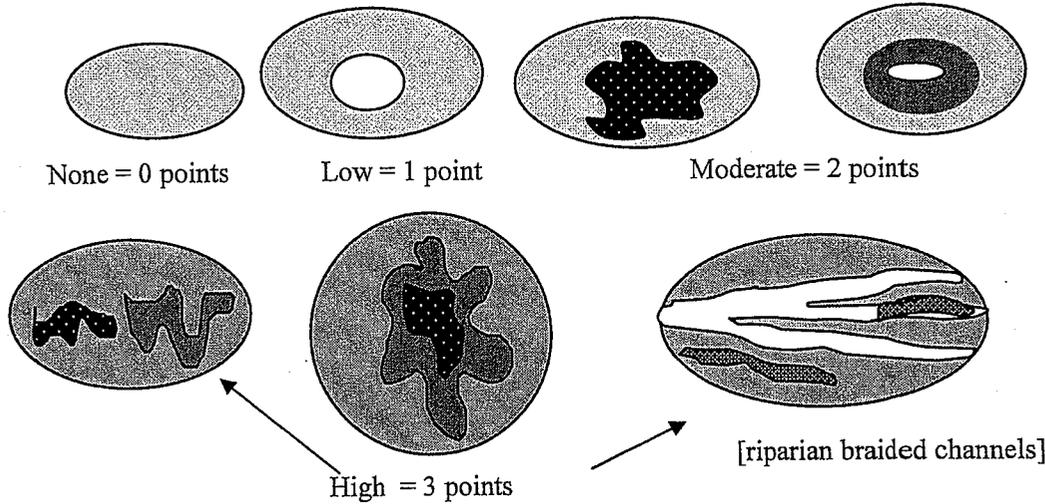
Wetland name or number 31A

These questions apply to wetlands of all HGM classes.		Points (Only score per box)																								
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat																										
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3 structures	points = 2																									
2 structures	points = 1																									
1 structure	points = 0																									
<p>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 ¼ acre to count. (see text for descriptions of hydroperiods)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: right;"><input type="checkbox"/> Permanently flooded or inundated</td> <td style="width: 25%;">4 or more types present</td> <td style="width: 25%;">points = 3</td> </tr> <tr> <td style="text-align: right;"><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td>3 types present</td> <td>points = 2</td> </tr> <tr> <td style="text-align: right;"><input checked="" type="checkbox"/> Occasionally flooded or inundated</td> <td>2 types present</td> <td>point = 1</td> </tr> <tr> <td style="text-align: right;"><input checked="" type="checkbox"/> Saturated only</td> <td>1 type present</td> <td>points = 0</td> </tr> <tr> <td style="text-align: right;"><input checked="" type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><input type="checkbox"/> Lake-fringe wetland = 2 points</td> <td></td> <td></td> </tr> <tr> <td style="text-align: right;"><input type="checkbox"/> Freshwater tidal wetland = 2 points</td> <td></td> <td></td> </tr> </table> <p style="text-align: right;"><u>Map of hydroperiods</u></p>		<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3	<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2	<input checked="" type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1	<input checked="" type="checkbox"/> Saturated only	1 type present	points = 0	<input checked="" type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland			<input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland			<input type="checkbox"/> Lake-fringe wetland = 2 points			<input type="checkbox"/> Freshwater tidal wetland = 2 points			<p>Figure</p> <p style="text-align: center;">2</p>
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<p>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 ft². (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</p> <p>If you counted:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; text-align: right;">> 19 species</td> <td style="width: 50%;">points = 2</td> </tr> <tr> <td style="text-align: right;">5 - 19 species</td> <td>points = 1</td> </tr> <tr> <td style="text-align: right;">< 5 species</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p>		> 19 species	points = 2	5 - 19 species	points = 1	< 5 species	points = 0	<p>Figure</p> <p style="text-align: center;">1</p>																		
> 19 species	points = 2																									
5 - 19 species	points = 1																									
< 5 species	points = 0																									

Total for page 3

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

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



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

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

Figure	
3	3

Comments

<p>H 2. Does the wetland unit have the opportunity to provide habitat for many species?</p>	<p>Figure _____</p>
<p>H 2.1 Buffers (see p. 80) <i>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."</i></p> <ul style="list-style-type: none"> — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5 — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4 — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — Heavy grazing in buffer. Points = 1 — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0. — Buffer does not meet any of the criteria above. Points = 1 <p style="text-align: center;">Aerial photo showing buffers</p>	<p style="text-align: center;">1</p>
<p>H 2.2 Corridors and Connections (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>).</p> <p style="text-align: center;">YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="text-align: center;">YES = 2 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:</p> <ul style="list-style-type: none"> within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? <p style="text-align: center;">YES = 1 point NO = 0 points</p>	<p style="text-align: center;">1</p>

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

- Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.
- Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).
- Cliffs:** Greater than 7.6 m (25 ft) high and occurring below 5000 ft.
- Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.
- Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.
- 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.
- Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages
- Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.
- Urban Natural Open Space:** A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.
- Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.
- Marine/Estuarine Shorelines:** Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Wetland name or number 31A

<p>H 2.4 Wetland Landscape (choose the <i>one</i> description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	3
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	6
<p>TOTAL for H 1 from page 14</p>	3
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	9

Wetland name or number 313

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 313 Date of site visit: 6-16-08

Rated by Erik Christensen Trained by Ecology? Yes No Date of training _____

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size _____

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III ___ IV

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

Score for Water Quality Functions	18
Score for Hydrologic Functions	2
Score for Habitat Functions	8
TOTAL score for Functions	28

Category based on SPECIAL CHARACTERISTICS 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	<input type="checkbox"/>

D Depressional and Flats Wetlands		Points (only 1 score per box)
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		
D	D 1. Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = <u>2</u></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p>	Figure <u>2</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = <u>0</u></p>	\emptyset
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation $\geq 95\%$ of area points = <u>3</u></p> <p>Wetland has persistent, ungrazed, vegetation $\geq 1/2$ of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation $\geq 1/10$ of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation $< 1/10$ of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p>	Figure <u>5</u>
D	<p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is $> 1/2$ total area of wetland points = 4</p> <p>Area seasonally ponded is $> 1/4$ total area of wetland points = <u>2</u></p> <p>Area seasonally ponded is $< 1/4$ total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p>	Figure <u>2</u>
D	Total for D 1	Add the points in the boxes above <u>9</u>
D	D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?	(see p. 44)
	<p>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. <i>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.</i></p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ <p>YES multiplier is 2 NO multiplier is 1</p>	multiplier <u>2</u>
D	TOTAL - Water Quality Functions	Multiply the score from D1 by D2 Add score to table on p. 1 <u>18</u>

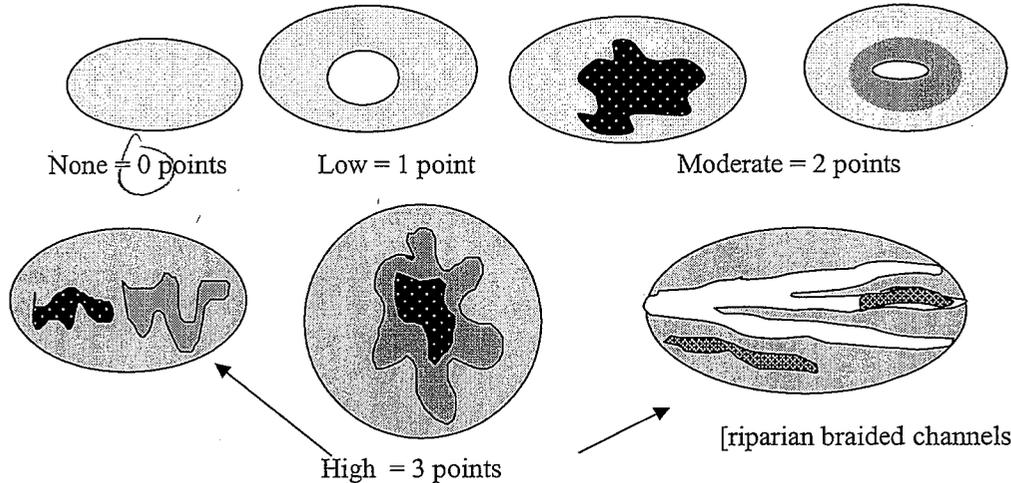
D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?		<i>(see p.46)</i>
D	<p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>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</p> <p><i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0</p>	2
D	<p>D 3.2 Depth of storage during wet periods</p> <p><i>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).</i></p> <p>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p>The wetland is a "headwater" wetland" points = 5</p> <p>Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p>Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p>Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p>Marks of ponding less than 0.5 ft points = 0</p>	∅
D	<p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p><i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i></p> <p>The area of the basin is less than 10 times the area of unit points = 5</p> <p>The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p>The area of the basin is more than 100 times the area of the unit points = 0</p> <p>Entire unit is in the FLATS class points = 5</p>	∅
D	<p>Total for D 3 <i>Add the points in the boxes above</i></p>	2
D	<p>D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?</p> <p>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.</p> <p><i>Note which of the following indicators of opportunity apply.</i></p> <ul style="list-style-type: none"> — 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 _____ <p>YES multiplier is 2 (NO) multiplier is 1</p>	<p><i>(see p. 49)</i></p> <p>multiplier</p> <p style="text-align: center;">1</p>
D	<p>TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4</p> <p style="text-align: right;"><i>Add score to table on p. 1</i></p>	2

<i>These questions apply to wetlands of all HGM classes.</i>		Points (only 1 score per box)											
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat													
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?													
<p>H 1.1 Vegetation structure (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.</p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>If the unit has a forested class check if:</i> <input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon</p> <p><i>Add the number of vegetation structures that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4 structures or more</td> <td>points = 4</td> </tr> <tr> <td>3 structures</td> <td>points = 2</td> </tr> <tr> <td>2 structures</td> <td>points = 1</td> </tr> <tr> <td>1 structure</td> <td>points = 0</td> </tr> </table> <p><u>Map of Cowardin vegetation classes</u></p>	4 structures or more	points = 4	3 structures	points = 2	2 structures	points = 1	1 structure	points = 0	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">0</p>				
4 structures or more	points = 4												
3 structures	points = 2												
2 structures	points = 1												
1 structure	points = 0												
<p>H 1.2. Hydroperiods (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)</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Permanently flooded or inundated</td> <td>4 or more types present</td> <td>points = 3</td> </tr> <tr> <td><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td>3 types present</td> <td>points = 2</td> </tr> <tr> <td><input type="checkbox"/> Occasionally flooded or inundated</td> <td>2 types present</td> <td>point = 1</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturated only</td> <td>1 type present</td> <td>points = 0</td> </tr> </table> <p><input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland</p> <p><input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points</p> <p style="text-align: right;"><u>Map of hydroperiods</u></p>	<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3	<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2	<input type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1	<input checked="" type="checkbox"/> Saturated only	1 type present	points = 0	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">1</p>
<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3											
<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2											
<input type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1											
<input checked="" type="checkbox"/> Saturated only	1 type present	points = 0											
<p>H 1.3. Richness of Plant Species (see p. 75) Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold) <i>You do not have to name the species.</i> <i>Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle</i></p> <p><i>List species below if you want to:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>If you counted:</td> <td>> 19 species</td> <td>points = 2</td> </tr> <tr> <td></td> <td>5 - 19 species</td> <td>points = 1</td> </tr> <tr> <td></td> <td>< 5 species</td> <td>points = 0</td> </tr> </table>	If you counted:	> 19 species	points = 2		5 - 19 species	points = 1		< 5 species	points = 0	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">1</p>			
If you counted:	> 19 species	points = 2											
	5 - 19 species	points = 1											
	< 5 species	points = 0											

Total for page 2

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

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



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

Figure _____

Ø

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

Ø

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

2

Comments

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

H 2.1 Buffers (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."

- 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) **Points = 5**
- 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. **Points = 4**
- 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. **Points = 4**
- 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference. **Points = 3**
- 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. **Points = 3**

If buffer does not meet any of the criteria above

- No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. **Points = 2**
- Heavy grazing in buffer. **Points = 1**
- Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) **Points = 0.**
- Buffer does not meet any of the criteria above. **Points = 1**

Aerial photo showing buffers

Figure _____

H 2.2 Corridors and Connections (see p. 81)

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

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

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

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

H 2.2.3 Is the wetland:

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

YES = 1 point NO = 0 points

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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

Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

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.

Caves: A naturally occurring cavity, recess, void, or system of interconnected passages

Oregon white Oak: Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

Urban Natural Open Space: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

Marine/Estuarine Shorelines: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Wetland name or number _____

<p>H 2.4 <u>Wetland Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	<p>3</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<p>6</p>
<p>TOTAL for H 1 from page 14</p>	<p>2</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	<p>8</p>

Wetland name or number 31C

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 31C Date of site visit: 5-15-07
11-13-07

Rated by Erik Christensen Trained by Ecology? Yes ___ No Date of training ___

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size 0.02 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III ___ IV

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

Score for Water Quality Functions	<u>14</u>
Score for Hydrologic Functions	<u>5</u>
Score for Habitat Functions	<u>7</u>
TOTAL score for Functions	<u>26</u>

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ Does not Apply ___

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

<u>IV</u>

Summary of basic information about the wetland unit

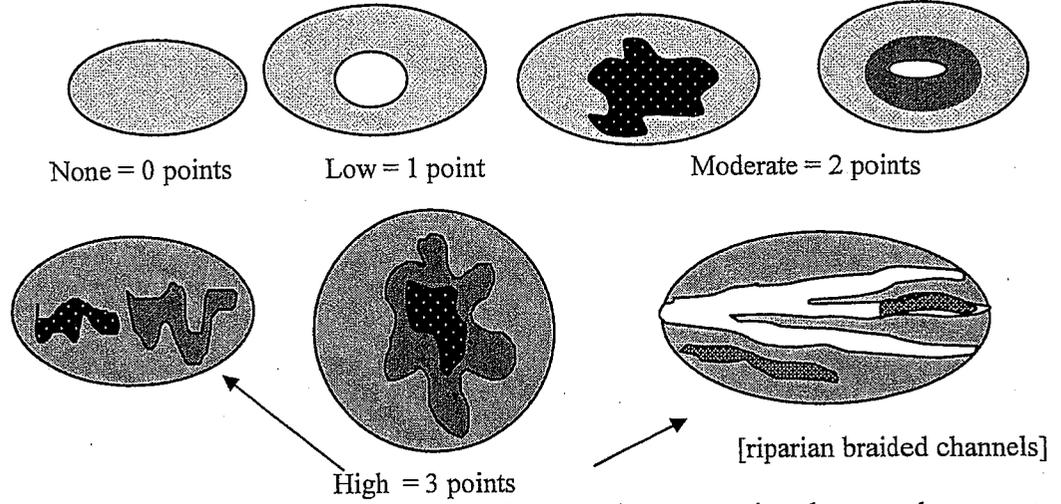
Wetland Unit has Special Characteristics	Wetland HGM Class used for Rating	
Estuarine	Depressional	<input checked="" type="checkbox"/>
Natural Heritage Wetland	Riverine	<input type="checkbox"/>
Bog	Lake-fringe	<input type="checkbox"/>
Mature Forest	Slope	<input type="checkbox"/>
Old Growth Forest	Flats	<input type="checkbox"/>
Coastal Lagoon	Freshwater Tidal	<input type="checkbox"/>
Interdunal		<input type="checkbox"/>
None of the above	Check if unit has multiple HGM classes present	<input type="checkbox"/>

D Depressional and Flats Wetlands		Points (only 1 score per box)
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		
D	D 1. Does the wetland unit have the <u>potential</u> to improve water quality?	(see p.38)
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p>	Figure <u>2</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions)</p> <p>YES points = 4</p> <p>NO points = 0</p>	<u>0</u>
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation >= 95% of area points = 5</p> <p>Wetland has persistent, ungrazed, vegetation >= 1/2 of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation >= 1/10 of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation <1/10 of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p>	Figure <u>5</u>
D	<p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p>Area seasonally ponded is > 1/4 total area of wetland points = 2</p> <p>Area seasonally ponded is < 1/4 total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p>	Figure <u>0</u>
D	Total for D 1	<i>Add the points in the boxes above</i> <u>7</u>
D	<p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>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. <i>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.</i></p> <ul style="list-style-type: none"> — 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 <u>✓</u> Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen Other <p><u>YES</u> multiplier is 2 NO multiplier is 1</p>	(see p. 44) multiplier <u>2</u>
D	TOTAL - Water Quality Functions	Multiply the score from D1 by D2 <i>Add score to table on p. 1</i> <u>14</u>

D Depressional and Flats Wetlands		Points <small>(only 1 score per box)</small>
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	<i>(see p.46)</i>
D	<p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>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</p> <p><i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0</p>	2
D	<p>D 3.2 Depth of storage during wet periods</p> <p><i>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).</i></p> <p>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p>The wetland is a "headwater" wetland points = 5</p> <p>Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p>Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p>Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p>Marks of ponding less than 0.5 ft points = 0</p>	0
D	<p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p><i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i></p> <p>The area of the basin is less than 10 times the area of unit points = 5</p> <p>The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p>The area of the basin is more than 100 times the area of the unit points = 0</p> <p>Entire unit is in the FLATS class points = 5</p>	3
D	<p>Total for D 3 <i>Add the points in the boxes above</i></p>	5
D	<p>D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?</p> <p>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.</p> <p><i>Note which of the following indicators of opportunity apply.</i></p> <ul style="list-style-type: none"> — 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 _____ <p>YES multiplier is 2 NO multiplier is 1</p>	<i>(see p. 49)</i> multiplier 1
D	<p>TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4</p> <p style="text-align: right;"><i>Add score to table on p. 1</i></p>	5

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

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



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

Figure

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

1

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	
<p>H 2.1 Buffers (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."</p> <ul style="list-style-type: none"> — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5 — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4 — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2 ✓ No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — Heavy grazing in buffer. Points = 1 — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0. — Buffer does not meet any of the criteria above. Points = 1 <p style="text-align: center;"><i>Aerial photo showing buffers</i></p>	<p>Figure</p> <p style="text-align: center; font-size: 2em;">2</p>
<p>H 2.2 Corridors and Connections (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>).</p> <p style="text-align: center;">YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="text-align: center;">YES = 2 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:</p> <ul style="list-style-type: none"> within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? <p style="text-align: center;">YES = 1 point NO = 0 points</p>	<p style="text-align: center; font-size: 2em;">4</p>

Total for page 3

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

 Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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 Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

 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.

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 Urban Natural Open Space: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

 Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

 Marine/Estuarine Shorelines: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Ø

Wetland name or number 31C

<p>H 2.4 <u>Wetland Landscape</u> (choose the one description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	<p>3</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<p>6</p>
<p>TOTAL for H 1 from page 14</p>	<p>1</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	<p>7</p>

Wetland name or number 31E

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 31E Date of site visit: 11.08.07

Rated by RH (ESA) Trained by Ecology? Yes No Date of training _____

SEC: _____ TOWNSHIP: _____ RANGE: _____ Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure _____ Estimated size 0.07 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I II III IV

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

Score for Water Quality Functions	16
Score for Hydrologic Functions	8
Score for Habitat Functions	16
TOTAL score for Functions	40

Category based on SPECIAL CHARACTERISTICS of wetland

I II Does not Apply

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

III

Summary of basic information about the wetland unit

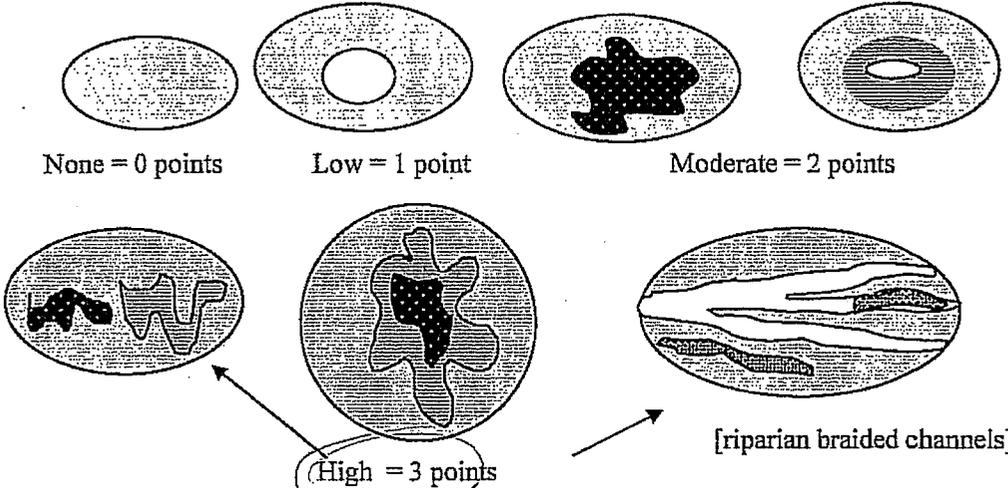
Wetland Unit has Special Characteristics	Wetland HGM Class used for Rating	
Estuarine	Depressional	
Natural Heritage Wetland	Riverine	<input checked="" type="checkbox"/>
Bog	Lake-fringe	
Mature Forest	Slope	
Old Growth Forest	Flats	
Coastal Lagoon	Freshwater Tidal	
Interdunal		
None of the above	Check if unit has multiple HGM classes present	<input checked="" type="checkbox"/>

These questions apply to wetlands of all HGM classes.		Points <small>(only 1 score per box)</small>							
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat									
H 1. Does the wetland unit have the potential to provide habitat for many species?									
<p>H 1.1 Vegetation structure (see p. 72) Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p> <input type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have >30% cover) If the unit has a forested class check if: <input checked="" type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon Add the number of vegetation structures that qualify. If you have:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">4 structures or more</td> <td style="width: 50%; text-align: right;">points = 4</td> </tr> <tr> <td>3 structures</td> <td style="text-align: right;">points = 2</td> </tr> <tr> <td>2 structures</td> <td style="text-align: right;">points = 1</td> </tr> <tr> <td>1 structure</td> <td style="text-align: right;">points = 0</td> </tr> </table> <p>Map of Cowardin vegetation classes:</p>	4 structures or more	points = 4	3 structures	points = 2	2 structures	points = 1	1 structure	points = 0	<p style="text-align: right;">Figure _____</p> <p style="text-align: center; font-size: 2em;">2</p>
4 structures or more	points = 4								
3 structures	points = 2								
2 structures	points = 1								
1 structure	points = 0								
<p>H 1.2. Hydroperiods (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 ¼ acre to count. (see text for descriptions of hydroperiods)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;"> <input type="checkbox"/> Permanently flooded or inundated <input type="checkbox"/> Seasonally flooded or inundated <input checked="" type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input checked="" type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points </td> <td style="width: 50%; text-align: right; vertical-align: top;"> 4 or more types present points = 3 3 types present points = 2 2 types present point = 1 1 type present points = 0 </td> </tr> </table> <p style="text-align: right;">Map of hydroperiods</p>	<input type="checkbox"/> Permanently flooded or inundated <input type="checkbox"/> Seasonally flooded or inundated <input checked="" type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input checked="" type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points	4 or more types present points = 3 3 types present points = 2 2 types present point = 1 1 type present points = 0	<p style="text-align: right;">Figure _____</p> <p style="text-align: center; font-size: 2em;">2</p>						
<input type="checkbox"/> Permanently flooded or inundated <input type="checkbox"/> Seasonally flooded or inundated <input checked="" type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input checked="" type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points	4 or more types present points = 3 3 types present points = 2 2 types present point = 1 1 type present points = 0								
<p>H 1.3. Richness of Plant Species (see p. 75) Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold) You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle If you counted:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">> 19 species</td> <td style="width: 50%; text-align: right;">points = 2</td> </tr> <tr> <td>5 - 19 species</td> <td style="text-align: right;">points = 1</td> </tr> <tr> <td>< 5 species</td> <td style="text-align: right;">points = 0</td> </tr> </table> <p>List species below if you want to:</p>	> 19 species	points = 2	5 - 19 species	points = 1	< 5 species	points = 0	<p style="text-align: center; font-size: 2em;">1</p>		
> 19 species	points = 2								
5 - 19 species	points = 1								
< 5 species	points = 0								

Total for page 5

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

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



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

Figure 3

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

3

2

10

Comments

<p>H 2. Does the wetland unit have the opportunity to provide habitat for many species?</p>	<p>Figure <u> </u></p>
<p>H 2.1 Buffers (see p. 80) <i>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."</i></p> <ul style="list-style-type: none"> — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5 — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4 — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference. Points = 3 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — Heavy grazing in buffer. Points = 1 — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0. <input checked="" type="checkbox"/> Buffer does not meet any of the criteria above. Points = 1 <p style="text-align: center;">Aerial photo showing buffers</p>	<p style="text-align: center;">1</p>
<p>H 2.2 Corridors and Connections (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>). YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above? YES = 2 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = 1 point NO = 0 points</p>	<p style="text-align: center;">2</p>

Total for page 3

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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

Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

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.

Caves: A naturally occurring cavity, recess, void, or system of interconnected passages

Oregon white Oak: Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

Urban Natural Open Space: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

Marine/Estuarine Shorelines: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Wetland name or number 31E

<p>H 2.4 Wetland Landscape (choose the one description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	<p>2</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<p>6</p>
<p>TOTAL for H 1 from page 14</p>	<p>10</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	<p>16</p>

Wetland name or number 32A

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 32A Date of site visit: 3-13-05

Rated by Eric Christensen Trained by Ecology? Yes ___ No Date of training _____

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size 0.10 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III IV ___

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

Score for Water Quality Functions

<u>16</u>
<u>5</u>
<u>11</u>
<u>34</u>

Score for Hydrologic Functions

Score for Habitat Functions

TOTAL score for Functions

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ Does not Apply

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

<u>III</u>

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics	Wetland HGM Class used for Rating	
Estuarine	Depressional	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>

D Depressional and Flats Wetlands		Points
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		(only 1 score per box)
D	D 1. Does the wetland unit have the <u>potential</u> to improve water quality?	(see p.38)
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = <u>2</u></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p>	Figure <u>2</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = <u>0</u></p>	<u>0</u>
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation > = 95% of area points = <u>3</u></p> <p>Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation < 1/10 of area points = 0</p> <p style="text-align: right;"><small>Map of Cowardin vegetation classes</small></p>	Figure <u>5</u>
D	<p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p>Area seasonally ponded is > 1/4 total area of wetland points = <u>2</u></p> <p>Area seasonally ponded is < 1/4 total area of wetland points = 0</p> <p style="text-align: right;"><small>Map of Hydroperiods</small></p>	Figure <u>2</u>
D	Total for D 1 <i>Add the points in the boxes above</i>	<u>9</u>
D	<p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>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. <i>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.</i></p> <ul style="list-style-type: none"> <input type="checkbox"/> Grazing in the wetland or within 150 ft <input type="checkbox"/> Untreated stormwater discharges to wetland <input type="checkbox"/> Tilled fields or orchards within 150 ft of wetland <input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging <input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland <input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen <input type="checkbox"/> Other _____ <p>YES multiplier is 2 NO multiplier is 1</p>	(see p. 44)
D	TOTAL - Water Quality Functions <i>Multiply the score from D1 by D2</i>	multiplier
<i>Add score to table on p. 1</i>		<u>2</u>
		<u>18</u>

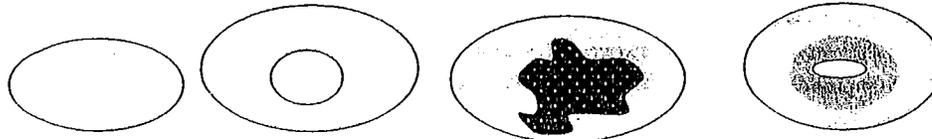
D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	(see p. 46)
D	<p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (permanently flowing) points = 0</p>	2
D	<p>D 3.2 Depth of storage during wet periods</p> <p>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).</p> <p>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p>The wetland is a "headwater" wetland" points = 5</p> <p>Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p>Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p>Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p>Marks of ponding less than 0.5 ft points = 0</p>	∅
D	<p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</p> <p>The area of the basin is less than 10 times the area of unit points = 5</p> <p>The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p>The area of the basin is more than 100 times the area of the unit points = 0</p> <p>Entire unit is in the FLATS class points = 5</p>	3
D	Total for D 3	5
	<i>Add the points in the boxes above</i>	
D	<p>D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?</p> <p>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.</p> <p><i>Note which of the following indicators of opportunity apply.</i></p> <ul style="list-style-type: none"> — 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 _____ <p>YES multiplier is 2 NO multiplier is 1</p>	multiplier <u>1</u>
D	TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4	5
	<i>Add score to table on p. 1</i>	

<i>These questions apply to wetlands of all HGM classes.</i>		Points <small>(only 1 score per box)</small>											
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat													
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?													
<p>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.</p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p><i>If the unit has a forested class check if:</i> <input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon</p> <p><i>Add the number of vegetation structures that qualify. If you have:</i></p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>4 structures or more</td> <td>points = 4</td> </tr> <tr> <td>3 structures</td> <td>points = 2</td> </tr> <tr> <td>2 structures</td> <td>points = 1</td> </tr> <tr> <td>1 structure</td> <td>points = 0</td> </tr> </table> <p><u>Map of Cowardin vegetation classes</u></p>	4 structures or more	points = 4	3 structures	points = 2	2 structures	points = 1	1 structure	points = 0	<p>Figure _____</p> <p style="font-size: 2em;">2</p>				
4 structures or more	points = 4												
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<p>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 ft². (<i>different patches of the same species can be combined to meet the size threshold</i>) <i>You do not have to name the species.</i> <i>Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle</i></p> <p style="text-align: center;">If you counted:</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>> 19 species</td> <td>points = 2</td> </tr> <tr> <td>5 - 19 species</td> <td>points = 1</td> </tr> <tr> <td>< 5 species</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p>	> 19 species	points = 2	5 - 19 species	points = 1	< 5 species	points = 0	<p style="font-size: 2em;">1</p>						
> 19 species	points = 2												
5 - 19 species	points = 1												
< 5 species	points = 0												

Total for page 4

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

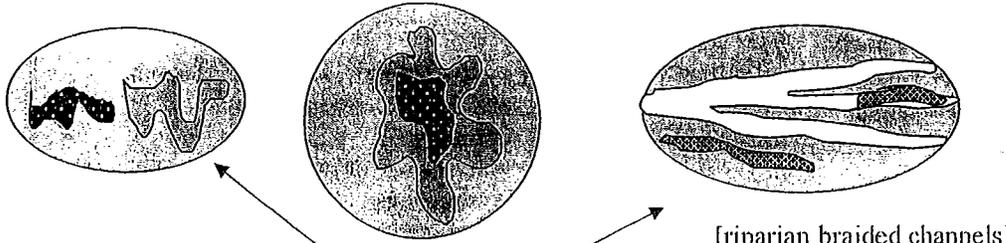
Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points

Low = 1 point

Moderate = 2 points



High = 3 points

[riparian braided channels]

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

Figure ____

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

5

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	Figure
<p>H 2.1 Buffers (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."</p> <ul style="list-style-type: none"> — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5 — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4 — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — Heavy grazing in buffer. Points = 1 — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0. <input checked="" type="checkbox"/> Buffer does not meet any of the criteria above. Points = 1 <p style="text-align: center;"><u>Aerial photo showing buffers</u></p>	1
<p>H 2.2 Corridors and Connections (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>).</p> <p style="text-align: center;">YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="text-align: center;">YES = 2 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:</p> <ul style="list-style-type: none"> within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? <p style="text-align: center;"><u>YES = 1 point</u> NO = 0 points</p>	1

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

_____ **Aspen Stands:** Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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

_____ **Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

_____ **Prairies:** Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

_____ **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.

_____ **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages

_____ **Oregon white Oak:** Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

_____ **Urban Natural Open Space:** A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

_____ **Estuary/Estuary-like:** Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

_____ **Marine/Estuarine Shorelines:** Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Wetland name or number 32 A

<p>H 2.4 Wetland Landscape (choose the <i>one</i> description of the landscape around the wetland that <i>best fits</i>) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile. points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed. points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile. points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	<p>3</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<p>6</p>
<p>TOTAL for H 1 from page 14</p>	<p>5</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	<p>11</p>

Wetland name or number 32B

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 32B Date of site visit: 3-13-08

Rated by Erin Christensen Trained by Ecology? Yes ___ No Date of training _____

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size 0.08

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III IV ___

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

Score for Water Quality Functions

Score for Hydrologic Functions

Score for Habitat Functions

TOTAL score for Functions

14
5
11
30

Category based on SPECIAL CHARACTERISTICS of wetland

I ___ II ___ Does not Apply

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

<u>III</u>

Summary of basic information about the wetland unit

Wetland Unit has Special Characteristics	Wetland HGM Class used for Rating	
Estuarine	Depressional	<input checked="" type="checkbox"/>
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	<input type="checkbox"/>

D Depressional and Flats Wetlands		Points (Only 1 score per box)
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		
D	D 1. Does the wetland unit have the potential to improve water quality?	(see p. 38)
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = <u>2</u></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p style="text-align: right;">Provide photo or drawing</p>	Figure <u>2</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = <u>0</u></p>	\emptyset
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation $\geq 95\%$ of area points = <u>5</u></p> <p>Wetland has persistent, ungrazed, vegetation $\geq 1/2$ of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation $\geq 1/10$ of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation $< 1/10$ of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p>	Figure <u>5</u>
D	<p>D 1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is $> 1/2$ total area of wetland points = 4</p> <p>Area seasonally ponded is $> 1/4$ total area of wetland points = 2</p> <p>Area seasonally ponded is $< 1/4$ total area of wetland points = <u>0</u></p> <p style="text-align: right;">Map of Hydroperiods</p>	Figure <u>0</u>
D	Total for D 1	Add the points in the boxes above <u>7</u>
D	<p>D 2. Does the wetland unit have the opportunity to improve water quality?</p> <p>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.</p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ <p>YES multiplier is 2 NO multiplier is 1</p>	(see p. 44) multiplier <u>2</u>
D	TOTAL - Water Quality Functions	Multiply the score from D1 by D2 Add score to table on p. 1 <u>14</u>

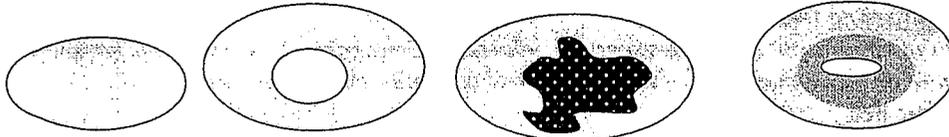
D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
	D 3. Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?	(see p.46)
D	<p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>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</p> <p>(If ditch is not permanently flowing treat unit as "intermittently flowing")</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0</p>	2
D	<p>D 3.2 Depth of storage during wet periods</p> <p><i>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).</i></p> <p>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p>The wetland is a "headwater" wetland points = 5</p> <p>Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p>Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p>Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p>Marks of ponding less than 0.5 ft points = 0</p>	0
D	<p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p><i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i></p> <p>The area of the basin is less than 10 times the area of unit points = 5</p> <p>The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p>The area of the basin is more than 100 times the area of the unit points = 0</p> <p>Entire unit is in the FLATS class points = 5</p>	3
D	Total for D 3	5
D	<p>D 4. Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?</p> <p>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.</p> <p><i>Note which of the following indicators of opportunity apply.</i></p> <ul style="list-style-type: none"> — 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 _____ <p>YES multiplier is 2 NO multiplier is 1</p>	multiplier <u>1</u>
D	TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4 <i>Add score to table on p. 1</i>	5

<i>These questions apply to wetlands of all HGM classes.</i>		Points <small>(only 1 score per box)</small>											
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat													
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?													
<p>H 1.1 Vegetation structure (see p. 72)</p> <p>Check the types of vegetation classes present (as defined by Cowardin)- Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p><input type="checkbox"/> Aquatic bed</p> <p><input checked="" type="checkbox"/> Emergent plants</p> <p><input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover)</p> <p><input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p>If the unit has a forested class check if:</p> <p><input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon</p> <p>Add the number of vegetation structures that qualify. If you have:</p> <table style="margin-left: auto; margin-right: 0;"> <tr> <td>4 structures or more</td> <td>points = 4</td> </tr> <tr> <td>3 structures</td> <td>points = 2</td> </tr> <tr> <td>2 structures</td> <td>points = <u>1</u></td> </tr> <tr> <td>1 structure</td> <td>points = 0</td> </tr> </table> <p><u>Map of Cowardin vegetation classes</u></p>	4 structures or more	points = 4	3 structures	points = 2	2 structures	points = <u>1</u>	1 structure	points = 0	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">1</p>				
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1 structure	points = 0												
<p>H 1.2. Hydroperiods (see p. 73)</p> <p>Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count. (see text for descriptions of hydroperiods)</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Permanently flooded or inundated</td> <td>4 or more types present</td> <td>points = 3</td> </tr> <tr> <td><input type="checkbox"/> Seasonally flooded or inundated</td> <td>3 types present</td> <td>points = <u>2</u></td> </tr> <tr> <td><input checked="" type="checkbox"/> Occasionally flooded or inundated</td> <td>2 types present</td> <td>point = 1</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturated only</td> <td>1 type present</td> <td>points = 0</td> </tr> </table> <p><input checked="" type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland</p> <p><input checked="" type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland</p> <p><input type="checkbox"/> Lake-fringe wetland = 2 points</p> <p><input type="checkbox"/> Freshwater tidal wetland = 2 points</p> <p style="text-align: right;"><u>Map of hydroperiods</u></p>	<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3	<input type="checkbox"/> Seasonally flooded or inundated	3 types present	points = <u>2</u>	<input checked="" type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1	<input checked="" type="checkbox"/> Saturated only	1 type present	points = 0	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">2</p>
<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3											
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<input checked="" type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1											
<input checked="" type="checkbox"/> Saturated only	1 type present	points = 0											
<p>H 1.3. Richness of Plant Species (see p. 75)</p> <p>Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold)</p> <p>You do not have to name the species.</p> <p>Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle</p> <p>If you counted:</p> <table style="margin-left: auto; margin-right: 0;"> <tr> <td>> 19 species</td> <td>points = 2</td> </tr> <tr> <td>5 - 19 species</td> <td>points = <u>1</u></td> </tr> <tr> <td>< 5 species</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p>	> 19 species	points = 2	5 - 19 species	points = <u>1</u>	< 5 species	points = 0	<p>Figure _____</p> <p style="text-align: center; font-size: 2em;">1</p>						
> 19 species	points = 2												
5 - 19 species	points = <u>1</u>												
< 5 species	points = 0												

Total for page 4

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

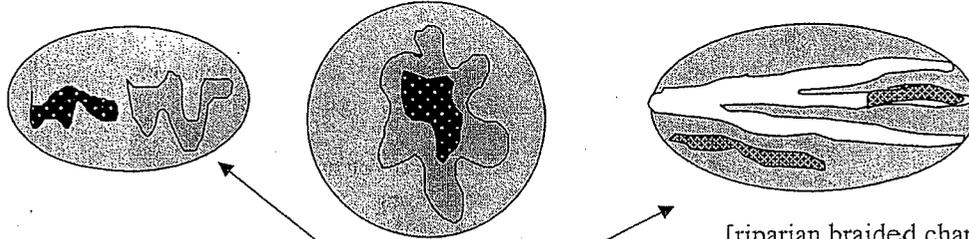
Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.



None = 0 points

Low = 1 point

Moderate = 2 points



High = 3 points

[riparian braided channels]

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

Figure _____

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least 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 scores from H1.1, H1.2, H1.3, H1.4, H1.5

5

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?		Figure
<p>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."</p> <ul style="list-style-type: none"> — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5 — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4 — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference. Points = 3 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — Heavy grazing in buffer. Points = 1 — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0. <input checked="" type="checkbox"/> Buffer does not meet any of the criteria above. Points = 1 <p style="text-align: center;"><u>Aerial photo showing buffers</u></p>	<p>1</p>	
<p>H 2.2 <u>Corridors and Connections</u> (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor). YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above? YES = 2 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland: within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? YES = 1 point NO = 0 points</p>	<p>1</p>	

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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

Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

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.

Caves: A naturally occurring cavity, recess, void, or system of interconnected passages

Oregon white Oak: Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

Urban Natural Open Space: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

Marine/Estuarine Shorelines: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Wetland name or number 32B

<p>H 2.4 Wetland Landscape (choose the <i>one</i> description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	3
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	6
<p>TOTAL for H 1 from page 14</p>	5
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	11

Wetland name or number 32C

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 32C Date of site visit: 11-15-07

Rated by M. Maynard Trained by Ecology? Yes No Date of training 04/06

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size 0.05 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III ___ IV

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

Score for Water Quality Functions	14
Score for Hydrologic Functions	5
Score for Habitat Functions	8
TOTAL score for Functions	27

Category based on SPECIAL CHARACTERISTICS 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	<input checked="" type="checkbox"/>
Natural Heritage Wetland	Riverine	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>

D Depressional and Flats Wetlands		Points <small>(only 11 score per box)</small>
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		
D	D 1. Does the wetland unit have the <u>potential</u> to improve water quality?	<i>(see p.38)</i>
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = <u>2</u></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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</p> <p><i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i></p> <p style="text-align: right;"><i>Provide photo or drawing</i></p>	Figure <u>2</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = <u>0</u></p>	<u>0</u>
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation > = 95% of area points = <u>5</u></p> <p>Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation < 1/10 of area points = 0</p> <p style="text-align: right;"><i>Map of Cowardin vegetation classes</i></p>	Figure <u>5</u>
D	<p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p>Area seasonally ponded is > 1/4 total area of wetland points = 2</p> <p>Area seasonally ponded is < 1/4 total area of wetland points = <u>0</u></p> <p style="text-align: right;"><i>Map of Hydroperiods</i></p>	Figure <u>0</u>
D	<p>Total for D 1 <i>Add the points in the boxes above</i></p>	<u>7</u>
D	<p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>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. <i>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.</i></p> <ul style="list-style-type: none"> — 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 <input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland — Wetland is fed by groundwater high in phosphorus or nitrogen — Other _____ <p>YES multiplier is 2 NO multiplier is 1</p>	<p><i>(see p. 44)</i></p> <p>multiplier <u>2</u></p>
D	<p>TOTAL - Water Quality Functions Multiply the score from D1 by D2</p> <p style="text-align: right;"><i>Add score to table on p. 1</i></p>	<u>14</u>

D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		
	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	<i>(see p. 46)</i>
D	<p>D 3.1 Characteristics of surface water flows out of the wetland unit</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 4</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>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</p> <p><i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i></p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0</p>	2
D	<p>D 3.2 Depth of storage during wet periods</p> <p><i>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).</i></p> <p>Marks of ponding are 3 ft or more above the surface or bottom of outlet points = 7</p> <p>The wetland is a "headwater" wetland points = 5</p> <p>Marks of ponding between 2 ft to < 3 ft from surface or bottom of outlet points = 5</p> <p>Marks are at least 0.5 ft to < 2 ft from surface or bottom of outlet points = 3</p> <p>Unit is flat (yes to Q. 2 or Q. 7 on key) but has small depressions on the surface that trap water points = 1</p> <p>Marks of ponding less than 0.5 ft points = 0</p>	∅
D	<p>D 3.3 Contribution of wetland unit to storage in the watershed</p> <p><i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i></p> <p>The area of the basin is less than 10 times the area of unit points = 5</p> <p>The area of the basin is 10 to 100 times the area of the unit points = 3</p> <p>The area of the basin is more than 100 times the area of the unit points = 0</p> <p>Entire unit is in the FLATS class points = 5</p>	3
D	<p>Total for D 3</p> <p style="text-align: right;"><i>Add the points in the boxes above</i></p>	5
D	<p>D 4. Does the wetland unit have the opportunity to reduce flooding and erosion?</p> <p>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.</p> <p><i>Note which of the following indicators of opportunity apply.</i></p> <ul style="list-style-type: none"> — 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 _____ <p>YES multiplier is 2 NO multiplier is 1</p>	multiplier 1
D	<p>TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4</p> <p style="text-align: right;"><i>Add score to table on p. 1</i></p>	5

These questions apply to wetlands of all HGM classes.
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat

Points
(only 1 score per box)

H 1. Does the wetland unit have the potential to provide habitat for many species?

H 1.1 Vegetation structure (see p. 72)
 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 structures that qualify. If you have:

4 structures or more	points = 4
3 structures	points = 2
2 structures	points = 1
1 structure	points = 0

Map of Cowardin vegetation classes

Figure 0

H 1.2. Hydroperiods (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)

<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3
<input type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2
<input checked="" type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1
<input checked="" type="checkbox"/> 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. Richness of Plant Species (see p. 75)
 Count the number of plant species in the wetland that cover at least 10 ft². (different patches of the same species can be combined to meet the size threshold)
 You do not have to name the species.
 Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle

If you counted:

> 19 species	points = 2
5 - 19 species	points = 1
< 5 species	points = <u>0</u>

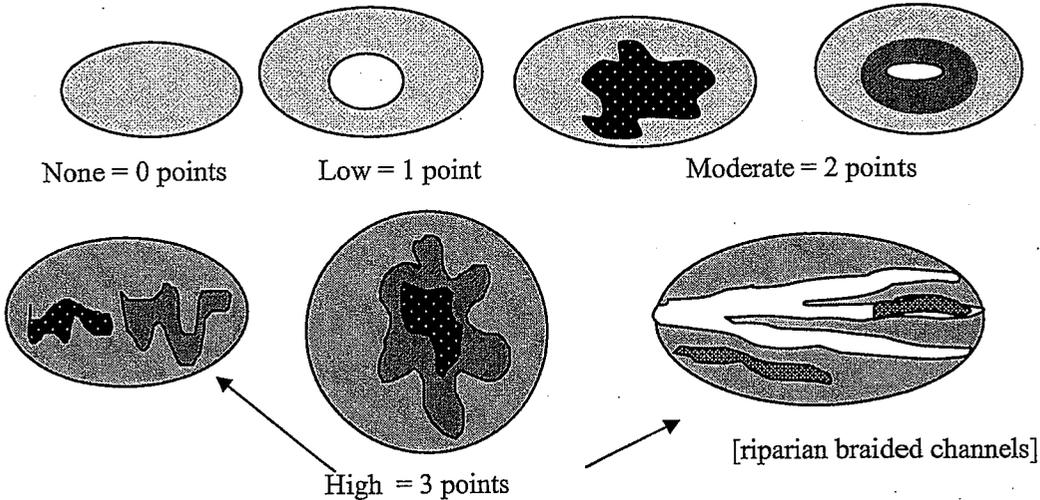
List species below if you want to:

Figure 0

Total for page 2

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

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



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

Figure _____

∅

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated.(structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

∅

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

2

Comments

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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

Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

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 rippap slides and mine tailings. May be associated with cliffs.

Caves: A naturally occurring cavity, recess, void, or system of interconnected passages

Oregon white Oak: Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

Urban Natural Open Space: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

Marine/Estuarine Shorelines: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

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)

Wetland name or number 32C

<p>H 2.4 Wetland Landscape (choose the <i>one</i> description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	<p>3</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<p>6</p>
<p>TOTAL for H 1 from page 14</p>	<p>2</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	<p>8</p>

Wetland name or number 33A

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 33A Date of site visit: 5-15-07 / 2-7-12

Rated by: Matt Maynard / Colin Worsley Trained by Ecology? Yes No Date of training: November 2005

SEC: 19 TWNSHP: 25N RNGE: 06E Is S/T/R in Appendix D? Yes No

Map of wetland unit: Figure _____ Estimated size _____

SUMMARY OF RATING

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

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

Score for Water Quality Functions	16
Score for Hydrologic Functions	0
Score for Habitat Functions	10
TOTAL Score for Functions	26

Category based on SPECIAL CHARACTERISTICS 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	X
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	X

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. <i>Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i> For the purposes of this rating system, “documented” means the wetland is on the appropriate state or federal database.		X
SP2. <i>Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species?</i> 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).		X
SP3. <i>Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?</i>		X
SP4. <i>Does the wetland unit have a local significance in addition to its functions?</i> 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.		X

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

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.

S Slope Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box)
S 1	Does the wetland have the <u>potential</u> to improve water quality?	(see p.64)
S 1.1	Characteristics of average slope of unit: <ul style="list-style-type: none"> Slope is 1% or less (a 1% slope has a 1 ft. vertical drop in elevation for every 100 ft. horizontal distance)..... points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0 	2
S 1.2	The soil 2 inches below the surface (or duff layer) is clay, organic (Use NRCS definitions). YES = 3 points NO = 0 points	3
S 1.3	Characteristics of the vegetation in the wetland that trap sediments and pollutants: <i>Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches.</i> <ul style="list-style-type: none"> Dense, uncut, herbaceous vegetation > 90% of the wetland area..... points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > 1/2 of area..... points = 2 Dense, uncut, herbaceous vegetation > 1/4 of area points = 1 Does not meet any of the criteria above for vegetation points = 0 Aerial photo or map with vegetation polygons	Figure ____ 3
Total for S 1		<i>Add the points in the boxes above</i> 8
S 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? <i>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.</i> <input type="checkbox"/> Grazing in the wetland or within 150 ft <input type="checkbox"/> Untreated stormwater discharges to wetland <input type="checkbox"/> Tilled fields, logging, or orchards within 150 ft. of wetland <input checked="" type="checkbox"/> Residential, urban areas, or golf courses are within 150 ft. upslope of wetland <input type="checkbox"/> Other _____ YES multiplier is 2 NO multiplier is 1	(see p. 67) Multiplier <u>X2</u>
◆ TOTAL – Water Quality Functions Multiply the score from S1 by S2; then <i>add score to table on p. 1</i>		16
HYDROLOGIC FUNCTIONS – Indicators that wetland functions to reduce flooding and stream erosion.		
S 3	Does the wetland have the <u>potential</u> to reduce flooding and stream erosion?	(see p.68)
S 3.1	Characteristics of vegetation that reduce the velocity of surface flows during storms: <i>Choose the points appropriate for the description that best fits conditions in the wetland (stems of plants should be thick enough (usually > 1/8in), or dense enough to remain erect during surface flows).</i> <ul style="list-style-type: none"> Dense, uncut, rigid vegetation covers > 90% of the area of the wetland points = 6 Dense, uncut, rigid vegetation > 1/2 area of wetland..... points = 3 Dense, uncut, rigid vegetation > 1/4 area..... points = 1 More than 1/4 of area is grazed, mowed, tilled, or vegetation is not rigid points = 0 	0
S 3.2	Characteristics of slope wetland that holds back small amounts of flood flows. The slope has small surface depressions that can retain water over at least 10% of its area. YES = 2 points NO = 0 points	0
<i>Add the points in the boxes above</i>		0
S 4	Does the wetland have the <u>opportunity</u> to reduce flooding and erosion? Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? <i>Note which of the following conditions apply.</i> <input type="checkbox"/> Wetland has surface runoff that drains to a river or stream that has flooding problems <input type="checkbox"/> Other _____ (Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam) YES multiplier is 2 NO multiplier is 1	(see p. 70) Multiplier <u>X1</u>
◆ TOTAL – Hydrologic Functions Multiply the score from S3 by S4; then <i>add score to table on p. 1</i>		0

Comments:

	<p>H 2.3 <u>Near or adjacent to other priority habitats listed by WDFW</u> (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)</p> <p>Which of the following priority habitats are within 330 ft. (100m) of the wetland unit? <i>NOTE: the connections do not have to be relatively undisturbed.</i></p> <p>___ Aspen Stands: Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p>___ 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).</p> <p>___ Herbaceous Balds: Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p>___ 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 than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.</p> <p>___ 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).</p> <p>___ Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.</p> <p>___ 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).</p> <p>___ 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.</p> <p>___ 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).</p> <p>___ 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.</p> <p>___ Cliffs: Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p>___ 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.</p> <p>___ 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.</p> <p> 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</p> <p>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)</p>	0
	<p>H 2.4 <u>Wetland Landscape:</u> Choose the one description of the landscape around the wetland that best fits (see p. 84)</p> <ul style="list-style-type: none"> • 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 milepoints = 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 milepoints = 3 • There is at least 1 wetland within 1/2 milepoints = 2 • There are no wetlands within 1/2 mile.....points = 0 	3
	<p>H 2 TOTAL Score – opportunity for providing habitat <i>Add the scores from H2.1, H2.2, H2.3, H2.4</i></p>	6
	<p style="text-align: right;"><i>TOTAL for H 1 from page 8</i></p>	4
◆	<p>Total Score for Habitat Functions Add the points for H 1 and H 2; then record the result on p. 1</p>	10

Comments:

<p>SC4</p>	<p>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? <i>If you answer yes you will still need to rate the wetland based on its function.</i></p> <p>___ 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).</p> <p>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.</p> <p>___ 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.</p> <p>YES = Category I NO = <u> X </u> not a forested wetland with special characteristics</p>	<p>Cat. I</p>
<p>SC5</p>	<p>Wetlands in Coastal Lagoons (see p. 91) Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p>___ 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.</p> <p>___ 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 (<i>needs to be measured near the bottom.</i>)</p> <p>YES = Go to SC 5.1 NO <u> X </u> not a wetland in a coastal lagoon</p> <p>SC 5.1 Does the wetland meet all of the following three conditions?</p> <p>___ 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).</p> <p>___ 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.</p> <p>___ The wetland is larger than 1/10 acre (4350 square ft.)</p> <p>YES = Category I NO = Category II</p>	<p>Cat. I</p> <p>Cat. II</p>
<p>SC6</p>	<p>Interdunal Wetlands (see p. 93) Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p>YES = Go to SC 6.1 NO <u> X </u> not an interdunal wetland for rating</p> <p><i>If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> • Long Beach Peninsula -- lands west of SR 103 • Grayland-Westport -- lands west of SR 105 • Ocean Shores-Copalis – lands west of SR 115 and SR 109 <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger?</p> <p>YES = Category II NO = go to SC 6.2</p> <p>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?</p> <p>YES = Category III</p>	<p>Cat. II</p> <p>Cat. III</p>
<p>◆</p>	<p>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</p>	

Comments:

Wetland name or number 33B

WETLAND RATING FORM – WESTERN WASHINGTON
Version 2 - Updated July 2006 to increase accuracy and reproducibility among users

Name of wetland (if known): 33B Date of site visit: 5-15-07
11-15-07

Rated by Erik Christensen Trained by Ecology? Yes No Date of training _____

SEC: ___ TOWNSHIP: ___ RANGE: ___ Is S/T/R in Appendix D? Yes ___ No ___

Map of wetland unit: Figure ___ Estimated size 0.01 acre

SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland

I ___ II ___ III IV ___

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

Score for Water Quality Functions

Score for Hydrologic Functions

Score for Habitat Functions

TOTAL score for Functions

24
7
7
38

Category based on SPECIAL CHARACTERISTICS 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	<input checked="" type="checkbox"/>
Natural Heritage Wetland	Riverine	<input type="checkbox"/>
Bog	Lake-fringe	<input type="checkbox"/>
Mature Forest	Slope	<input type="checkbox"/>
Old Growth Forest	Flats	<input type="checkbox"/>
Coastal Lagoon	Freshwater Tidal	<input type="checkbox"/>
Interdunal		<input type="checkbox"/>
None of the above	Check if unit has multiple HGM classes present	<input type="checkbox"/>

D Depressional and Flats Wetlands		Points (only 1 score per box)
WATER QUALITY FUNCTIONS - Indicators that the wetland unit functions to improve water quality		
D	D 1. Does the wetland unit have the <u>potential</u> to improve water quality?	(see p. 38)
D	<p>D 1.1 Characteristics of surface water flows out of the wetland:</p> <p>Unit is a depression with no surface water leaving it (no outlet) points = 3</p> <p>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet points = 2</p> <p>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 1</p> <p>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")</p> <p style="text-align: right;">Provide photo or drawing</p>	Figure <u>3</u>
D	<p>S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (<i>use NRCS definitions</i>)</p> <p>YES points = 4</p> <p>NO points = 0</p>	<u>0</u>
D	<p>D 1.3 Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class)</p> <p>Wetland has persistent, ungrazed, vegetation > = 95% of area points = 5</p> <p>Wetland has persistent, ungrazed, vegetation > = 1/2 of area points = 3</p> <p>Wetland has persistent, ungrazed vegetation > = 1/10 of area points = 1</p> <p>Wetland has persistent, ungrazed vegetation < 1/10 of area points = 0</p> <p style="text-align: right;">Map of Cowardin vegetation classes</p>	Figure <u>5</u>
D	<p>D1.4 Characteristics of seasonal ponding or inundation.</p> <p><i>This is the area of the wetland unit 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 yrs.</i></p> <p>Area seasonally ponded is > 1/2 total area of wetland points = 4</p> <p>Area seasonally ponded is > 1/4 total area of wetland points = 2</p> <p>Area seasonally ponded is < 1/4 total area of wetland points = 0</p> <p style="text-align: right;">Map of Hydroperiods</p>	Figure <u>4</u>
D	Total for D 1 <i>Add the points in the boxes above</i>	<u>12</u>
D	<p>D 2. Does the wetland unit have the <u>opportunity</u> to improve water quality?</p> <p>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. <i>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.</i></p> <p><input type="checkbox"/> Grazing in the wetland or within 150 ft</p> <p><input checked="" type="checkbox"/> Untreated stormwater discharges to wetland</p> <p><input type="checkbox"/> Tilled fields or orchards within 150 ft of wetland</p> <p><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</p> <p><input type="checkbox"/> Residential, urban areas, golf courses are within 150 ft of wetland</p> <p><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</p> <p><input type="checkbox"/> Other _____</p> <p>YES multiplier is 2 NO multiplier is 1</p>	(see p. 44) multiplier <u>2</u>
D	TOTAL - Water Quality Functions Multiply the score from D1 by D2 <i>Add score to table on p. 1</i>	<u>24</u>

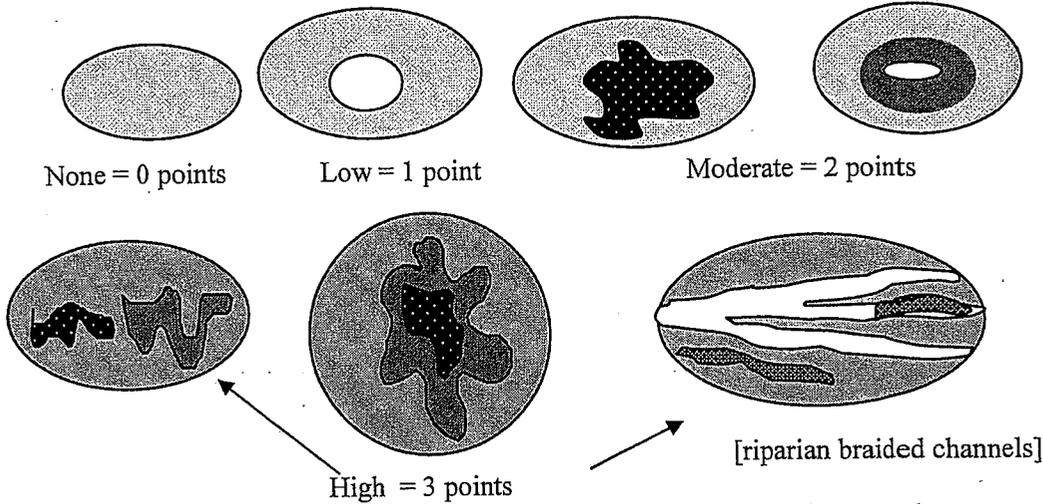
D Depressional and Flats Wetlands		Points (only 1 score per box)
HYDROLOGIC FUNCTIONS - Indicators that the wetland unit functions to reduce flooding and stream degradation		(see p. 46)
D	D 3. Does the wetland unit have the potential to reduce flooding and erosion?	
D	D 3.1 Characteristics of surface 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 <i>(If ditch is not permanently flowing treat unit as "intermittently flowing")</i> Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) points = 0	4
D	D 3.2 Depth of storage during wet periods <i>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).</i> Marks of ponding are 3 ft or more above the surface or bottom of 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 Unit 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	6
D	D 3.3 Contribution of wetland unit to storage in the watershed <i>Estimate the ratio of the area of upstream basin contributing surface water to the wetland to the area of the wetland unit itself.</i> 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
D	Total for D 3 <i>Add the points in the boxes above</i>	7
D	D 4. Does the wetland unit have the opportunity 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. <i>Note which of the following indicators of opportunity apply.</i> — 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	multiplier <u>1</u>
D	TOTAL - Hydrologic Functions Multiply the score from D 3 by D 4 <i>Add score to table on p. 1</i>	7

These questions apply to wetlands of all HGM classes.		Points <small>(only if score per box)</small>																								
HABITAT FUNCTIONS - Indicators that unit functions to provide important habitat																										
H 1. Does the wetland unit have the <u>potential</u> to provide habitat for many species?																										
<p>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 ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</p> <p><input type="checkbox"/> Aquatic bed <input checked="" type="checkbox"/> Emergent plants <input type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input type="checkbox"/> Forested (areas where trees have >30% cover)</p> <p>If the unit has a forested class check if: <input type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon</p> <p>Add the number of vegetation structures that qualify. If you have:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">4 structures or more</td> <td style="width: 50%; border: none;">points = 4</td> </tr> <tr> <td style="border: none;">3 structures</td> <td style="border: none;">points = 2</td> </tr> <tr> <td style="border: none;">2 structures</td> <td style="border: none;">points = 1</td> </tr> <tr> <td style="border: none;">1 structure</td> <td style="border: none;">points = 0</td> </tr> </table> <p><small>Map of Cowardin vegetation classes</small></p>		4 structures or more	points = 4	3 structures	points = 2	2 structures	points = 1	1 structure	points = 0	<p>Figure</p> <p style="font-size: 2em;">Ø</p>																
4 structures or more	points = 4																									
3 structures	points = 2																									
2 structures	points = 1																									
1 structure	points = 0																									
<p>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 ¼ acre to count. (see text for descriptions of hydroperiods)</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><input type="checkbox"/> Permanently flooded or inundated</td> <td style="width: 25%; border: none;">4 or more types present</td> <td style="width: 25%; border: none;">points = 3</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td style="border: none;">3 types present</td> <td style="border: none;">points = 2</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Occasionally flooded or inundated</td> <td style="border: none;">2 types present</td> <td style="border: none;">point = 1</td> </tr> <tr> <td style="border: none;"><input checked="" type="checkbox"/> Saturated only</td> <td style="border: none;">1 type present</td> <td style="border: none;">points = 0</td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland</td> <td colspan="2" style="border: none;"></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland</td> <td colspan="2" style="border: none;"></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Lake-fringe wetland = 2 points</td> <td colspan="2" style="border: none;"></td> </tr> <tr> <td style="border: none;"><input type="checkbox"/> Freshwater tidal wetland = 2 points</td> <td colspan="2" style="border: none;"></td> </tr> </table> <p><small>Map of hydroperiods</small></p>		<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3	<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2	<input checked="" type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1	<input checked="" type="checkbox"/> Saturated only	1 type present	points = 0	<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland			<input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland			<input type="checkbox"/> Lake-fringe wetland = 2 points			<input type="checkbox"/> Freshwater tidal wetland = 2 points			<p>Figure</p> <p style="font-size: 2em;">2</p>
<input type="checkbox"/> Permanently flooded or inundated	4 or more types present	points = 3																								
<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 types present	points = 2																								
<input checked="" type="checkbox"/> Occasionally flooded or inundated	2 types present	point = 1																								
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<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland																										
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<input type="checkbox"/> Lake-fringe wetland = 2 points																										
<input type="checkbox"/> Freshwater tidal wetland = 2 points																										
<p>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 ft². (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</p> <p>If you counted:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">> 19 species</td> <td style="width: 50%; border: none;">points = 2</td> </tr> <tr> <td style="border: none;">5 - 19 species</td> <td style="border: none;">points = 1</td> </tr> <tr> <td style="border: none;">< 5 species</td> <td style="border: none;">points = 0</td> </tr> </table> <p>List species below if you want to:</p>		> 19 species	points = 2	5 - 19 species	points = 1	< 5 species	points = 0	<p>Figure</p> <p style="font-size: 2em;">Ø</p>																		
> 19 species	points = 2																									
5 - 19 species	points = 1																									
< 5 species	points = 0																									

Total for page 2

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

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



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

Figure

0

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

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

- Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long).
- Standing snags (diameter at the bottom > 4 inches) in the wetland
- Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)
- Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)
- At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in areas that are permanently or seasonally inundated. (structures for egg-laying by amphibians)
- Invasive plants cover less than 25% of the wetland area in each stratum of plants

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

0

H 1. TOTAL Score - potential for providing habitat
Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5

2

Comments

H 2. Does the wetland unit have the opportunity to provide habitat for many species?	Figure
<p>H 2.1 Buffers (see p. 80) <i>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."</i></p> <ul style="list-style-type: none"> — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5 — 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 50% circumference. Points = 4 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water >95% circumference. Points = 4 — 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water > 25% circumference, . Points = 3 — 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for > 50% circumference. Points = 3 <p style="text-align: center;">If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> — No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland > 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — No paved areas or buildings within 50m of wetland for >50% circumference. Light to moderate grazing, or lawns are OK. Points = 2 — Heavy grazing in buffer. Points = 1 — Vegetated buffers are <2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland) Points = 0. <input checked="" type="checkbox"/> Buffer does not meet any of the criteria above. Points = 1 <p style="text-align: center;"><i>Aerial photo showing buffers</i></p>	1
<p>H 2.2 Corridors and Connections (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (<i>dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor</i>).</p> <p style="text-align: center;">YES = 4 points (go to H 2.3) NO = go to H 2.2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above?</p> <p style="text-align: center;">YES = 2 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:</p> <ul style="list-style-type: none"> within 5 mi (8km) of a brackish or salt water estuary OR within 3 mi of a large field or pasture (>40 acres) OR within 1 mi of a lake greater than 20 acres? <p style="text-align: center;">YES = 1 point NO = 0 points</p>	1

Total for page 2

H 2.3 Near or adjacent to other priority habitats listed by WDFW (see p. 82)

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

These are DFW definitions. Check with your local DFW biologist if there are any questions.

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

 Aspen Stands: Pure or mixed stands of aspen greater than 0.8 ha (2 acres).

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

 Old-growth 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 than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.

 Prairies: Relatively undisturbed areas (as indicated by dominance of native plants) where grasses and/or forbs form the natural climax plant community.

 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.

 Caves: A naturally occurring cavity, recess, void, or system of interconnected passages

 Oregon white Oak: Woodlands Stands of pure oak or oak/conifer associations where canopy coverage of the oak component of the stand is 25%.

 Urban Natural Open Space: A priority species resides within or is adjacent to the open space and uses it for breeding and/or regular feeding; and/or the open space functions as a corridor connecting other *priority habitats*, especially those that would otherwise be isolated; and/or the open space is an isolated remnant of natural habitat larger than 4 ha (10 acres) and is surrounded by urban development.

 Estuary/Estuary-like: Deepwater tidal habitats and adjacent tidal wetlands, usually semi-enclosed by land but with open, partly obstructed or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land. The salinity may be periodically increased above that of the open ocean by evaporation. Along some low-energy coastlines there is appreciable dilution of sea water. Estuarine habitat extends upstream and landward to where ocean-derived salts measure less than 0.5ppt. during the period of average annual low flow. Includes both estuaries and lagoons.

 Marine/Estuarine Shorelines: Shorelines include the intertidal and subtidal zones of beaches, and may also include the backshore and adjacent components of the terrestrial landscape (e.g., cliffs, snags, mature trees, dunes, meadows) that are important to shoreline associated fish and wildlife and that contribute to shoreline function (e.g., sand/rock/log recruitment, nutrient contribution, erosion control).

If wetland has **3 or more** priority habitats = **4 points**

If wetland has **2** priority habitats = **3 points**

If wetland has **1** priority habitat = **1 point**

No habitats = 0 points

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

0

Wetland name or number 33B

<p>H 2.4 Wetland Landscape (choose the one description of the landscape around the wetland that best fits) (see p. 84)</p> <p>There are at least 3 other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5</p> <p>The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within ½ mile points = 5</p> <p>There are at least 3 other wetlands within ½ mile, BUT the connections between them are disturbed points = 3</p> <p>The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetland within ½ mile points = 3</p> <p>There is at least 1 wetland within ½ mile. points = 2</p> <p>There are no wetlands within ½ mile. points = 0</p>	<p>3</p>
<p>H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4</p>	<p>5</p>
<p>TOTAL for H 1 from page 14.</p>	<p>2</p>
<p>Total Score for Habitat Functions – add the points for H 1, H 2 and record the result on p. 1</p>	<p>7</p>

APPENDIX C

Wetland Functions and Values Forms

Wetland Functions & Values Form

Wetland I.D. 31A Project: ELST Re-delineation Assessed by: Erik Christensen

Cowardin Class: PEM Ecology Category: III Local Rating: III Wetland size: 0.03 acre Date: 11/14/07

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland is not likely to provide this function because it is a sloped wetland with a ditch located at the toe of slope.		
Sediment Removal	X		The ditch at the toe of the slope has slow moving water and is vegetated with herbaceous vegetation.		Rating=Low Qualifiers: (1, 2, 3, 5)
Nutrient & Toxicant Removal	X		Inundation occurs in the ditch at the toe of slope.		Rating=Low Qualifiers: (1)
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a shoreline or water course.		
Production of Organic Matter and its Export	X		The ditch in the wetland is densely covered with herbaceous vegetation and flows to an unnamed tributary.		Rating= Moderate Qualifiers: (1, 2, 6)
General Habitat Suitability	X		Wetland has connectivity to an unnamed tributary		Rating=Low Qualifiers: (2)
Habitat for Aquatic Invertebrates	X		Wetland contains a vegetated ditch that is seasonally ponded.		Rating=Moderate Qualifiers: (1, 4, 6)
Habitat for Amphibians	X		Wetland contains a vegetated ditch that is seasonally ponded. The ditch flows into an unnamed tributary.		Rating=Low Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		X	No permanent inundation occurs in the wetland.		
Habitat for Wetland-Associated Birds		X	No open water occurs in the wetland.		
General Fish Habitat		X	Wetland is not associated with a fish bearing water.		
Native Plant Richness		X	Dominant vegetation in wetland is <i>Phalaris arundinacea</i> .		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 31B Project: ELST Re-delineation Assessed by: M. Maynard

Cowardin Class: PEM Ecology Category: IV Local Rating: IV Wetland size: 0.01 acre Date: 11/13/07

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland likely provides this function since it is receives local stormwater runoff and is depressional.		Rating=Low Qualifiers: (2)
Sediment Removal	X		Wetland likely provides this function due to the presence of shallow inundation and dense herbaceous vegetation.		Rating=Low Qualifiers: (3, 5)
Nutrient & Toxicant Removal	X		Wetland likely provides this function due to the presence of shallow inundation and dense herbaceous vegetation.		Rating=Low Qualifiers: (2, 4)
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a water course.		
Production of Organic Matter and its Export	X		Wetland vegetation is dominated by deciduous vegetation. Organic matter can be exported by the water flowing out through the culvert. It is limited by size and light flow.		Rating=Low Qualifiers: (1, 5, 6)
General Habitat Suitability	X		Wetland is bordered to the west by trail and has development to north and east as well.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	X		The wetland has seasonal inundation with emergent vegetation.		Rating=Low Qualifiers: (1, 4, 6)
Habitat for Amphibians	X		The wetland likely provides only refuge for amphibians.		Rating=Low Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		X	Wetland does not have permanent standing water.		
Habitat for Wetland-Associated Birds		X	The wetland lacks the required inundation to emergent vegetation ratio.		
General Fish Habitat		X	Wetland is not associated with a fish-bearing water.		
Native Plant Richness		X	Dominate vegetation is invasive.		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 31C Project: ELST Re-delineation Assessed by: Erik Christensen

Cowardin Class: PEM Ecology Category: IV Local Rating: IV Wetland size: 0.02 acre Date: 11/13/07

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland is not likely to provide this function because it is a sloped wetland with a ditch located at the toe of slope.		
Sediment Removal	X		The ditch at the toe of the slope has slow moving water and is vegetated with herbaceous vegetation.		Rating=Low Qualifiers: (1, 2, 3, 5)
Nutrient & Toxicant Removal	X		Inundation occurs in the ditch at the toe of slope.		Rating=Low Qualifiers: (1, 2)
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a shoreline or water course.		
Production of Organic Matter and its Export	X		The ditch in the wetland is densely covered with herbaceous vegetation and flows out through a culvert to the north.		Rating=Moderate Qualifiers: (1, 6)
General Habitat Suitability		X	Wetland is not likely to provide this function due to the small size, lack of habitat structures, and single Cowardin class.		
Habitat for Aquatic Invertebrates	X		Wetland contains a vegetated ditch that is occasionally inundated.		Rating=Low Qualifiers: (1, 4)
Habitat for Amphibians	X		Wetland contains a vegetated ditch that is occasionally inundated.		Rating=Low Qualifiers: (1, 2)
Habitat for Wetland-Associated Mammals		X	No permanent inundation occurs in the wetland.		
Habitat for Wetland-Associated Birds		X	No open water occurs in the wetland.		
General Fish Habitat		X	Wetland is not associated with a fish bearing water.		
Native Plant Richness		X	Dominant vegetation in wetland is an invasive species (<i>Phalaris arundinacea</i>).		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 31E Project: ELST Re-delineation Assessed by: M. Maynard

Cowardin Class: PFO/PSS Ecology Category: III Local Rating: III Wetland size: 0.07 acre Date: 11/08/07

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland likely does not provide this function since it is sloped and lacks sufficient depressions.		
Sediment Removal		X	Wetland likely does not provide this function since it is sloped and lacks sufficient depressions.		
Nutrient & Toxicant Removal		X	Wetland likely does not provide this function since it is sloped and lacks sufficient depressions.		
Erosion Control & Shoreline Stabilization	X		Wetland likely provides this function since it is densely vegetated adjacent to the stream.		Rating=Moderate Qualifiers: (1, 3)
Production of Organic Matter and its Export	X		Wetland vegetation is dominated by deciduous vegetation. Organic matter can be exported by the stream running through the wetland.		Rating=Moderate Qualifiers: (2, 6)
General Habitat Suitability	X		Wetland is bordered to the west by lake edge and has a stream running through it.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	X		The wetland is sloped and generally saturated only. However, a seasonal stream does flow through the wetland.		Rating=Low Qualifiers: (1, 6)
Habitat for Amphibians	X		The wetland is sloped and generally saturated only. However, a seasonal stream does flow through the wetland.		Rating=Low Qualifiers: (1, 6)
Habitat for Wetland-Associated Mammals		X	Wetland does not have permanent standing water.		
Habitat for Wetland-Associated Birds		X	The wetland lacks the required inundation to emergent vegetation ratio.		
General Fish Habitat	X		Wetland likely provides some temporary refuge for some small fish.		Rating=Low Qualifiers: (1, 4)
Native Plant Richness	X		Codominant vegetation is native and contains three strata of vegetation with mature trees		Rating=Moderate Qualifiers: (1, 3, 4)
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 32A Project: ELST Re-delineation Assessed by: Erik Christensen

Cowardin Class: PFO/PSS Ecology Category: III Local Rating: III Wetland size: 0.10 acre Date: 03/13/08

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland has little flood storage capacity.		
Sediment Removal	X		Wetland is densely vegetated with <i>Phalaris arundinacea</i> . Seasonal ponding occurs.		Rating=Low Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	X		Wetland is densely vegetated with <i>Phalaris arundinacea</i> . Seasonal ponding occurs.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a water course.		
Production of Organic Matter and its Export	X		Wetland is densely covered with herbaceous and deciduous vegetation and export occurs via a ditch.		Rating=Moderate Qualifiers: (1, 2, 6)
General Habitat Suitability	X		Wetland is surrounded by residential development and roads. Invasive vegetation is dominant.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	X		Wetland is seasonally ponded and is vegetated by emergent vegetation.		Rating=Moderate Qualifiers: (1, 4, 5, 6)
Habitat for Amphibians	X		Wetland is seasonally ponded and is vegetated by emergent vegetation.		Rating=Moderate Qualifiers: (1, 2, 4, 6)
Habitat for Wetland-Associated Mammals		X	No permanent inundation occurs in the wetland.		
Habitat for Wetland-Associated Birds		X	No open water occurs in the wetland.		
General Fish Habitat		X	Wetland is not associated with a water course.		
Native Plant Richness		X	Invasive species dominate the vegetation in wetland is <i>Phalaris arundinacea</i> and <i>Rubus armeniacus</i>		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 32B Project: ELST Re-delineation Assessed by: Erik Christensen

Cowardin Class: PEM Ecology Category: III Local Rating: III Wetland size: 0.08 acre Date: 03/13/08

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland has little flood storage capacity.		
Sediment Removal	X		Wetland is densely vegetated with <i>Phalaris arundinacea</i> . Occasional ponding occurs.		Rating=Low Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	X		Wetland is densely vegetated with <i>Phalaris arundinacea</i> . Occasional ponding occurs.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization	X		Wetland is densely vegetated with <i>Rubus armeniacus</i> and <i>Phalaris arundinacea</i> . A tributary flows through the wetland.		Rating=Low Qualifiers: (1, 2)
Production of Organic Matter and its Export	X		Wetland is densely covered with herbaceous vegetation and a tributary flows through it.		Rating=Moderate Qualifiers: (1, 6)
General Habitat Suitability	X		Wetland is connected to a stream, however, wetland is surrounded by residential development and roads. Invasive vegetation is dominant.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	X		Wetland is seasonally ponded and is vegetated by emergent vegetation. A tributary flows through the wetland.		Rating=Moderate Qualifiers: (1, 4, 6)
Habitat for Amphibians	X		Wetland is seasonally ponded and is vegetated by emergent vegetation. A tributary flows through the wetland.		Rating=Moderate Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		X	No permanent inundation occurs in the wetland.		
Habitat for Wetland-Associated Birds		X	No open water occurs in the wetland.		
General Fish Habitat	X		Wetland is covered by dense herbaceous and deciduous shrubs that provide shade, cover, and detrital matter to the tributary.		Rating=Low Qualifiers: (4)
Native Plant Richness		X	Dominant vegetation in wetland is <i>Phalaris arundinacea</i> .		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 32C Project: ELST Re-delineation Assessed by: Erik Christensen

Cowardin Class: PEM Ecology Category: IV Local Rating: IV Wetland size: 0.05 acre Date: 11/15/07

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland has limited flood storage capacity due to the presence of a stream which drains the wetland.		
Sediment Removal	X		Wetland is densely vegetated with <i>Rubus armeniacus</i> . Occasional ponding occurs.		Rating=Low Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	X		Wetland is densely vegetated with <i>Rubus armeniacus</i> . Occasional ponding occurs.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization	X		Wetland is densely vegetated with <i>Rubus armeniacus</i> and a tributary flows through the wetland.		Rating=Low Qualifiers: (1, 2)
Production of Organic Matter and its Export	X		Wetland is densely covered with herbaceous vegetation and deciduous shrubs, and a tributary flows through it.		Rating=Moderate Qualifiers: (1, 6)
General Habitat Suitability	X		Wetland is connected to a stream, however, wetland is surrounded by residential development and roads. Invasive vegetation is dominant.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	X		Wetland is seasonally ponded and is vegetated by emergent vegetation. A tributary flows through the wetland.		Rating=Moderate Qualifiers: (1, 4, 6)
Habitat for Amphibians	X		Wetland is occasionally ponded and is vegetated by emergent and shrub vegetation. A tributary flows through the wetland.		Rating=Moderate Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		X	No permanent inundation occurs in the wetland.		
Habitat for Wetland-Associated Birds		X	No open water occurs in the wetland.		
General Fish Habitat	X		Wetland is covered by dense herbaceous vegetation and deciduous shrubs that provide shade, cover, and detrital matter to the tributary.		Rating=Low Qualifiers: (4)
Native Plant Richness		X	Dominant vegetation in wetland is <i>Rubus armeniacus</i> .		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction		

Wetland Functions & Values Form

Wetland I.D. 33A Project: ELST Re-delineation Assessed by: C. Worsley

Cowardin Class: PEM Ecology Category: IV Local Rating: IV Wetland size: ~0.04 ac Date: 02/07/12

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland likely does not provide this function since it is sloped and lacks sufficient depressions.		
Sediment Removal	X		Wetland likely provides minimal support for this function since it is sloped and lacks sufficient depressions.		Rating=Low Qualifiers: (1, 3)
Nutrient & Toxicant Removal	X		Wetland likely provides minimal support for this function since it is sloped and lacks sufficient depressions.		Rating=Low Qualifiers: (1, 4, 5)
Erosion Control & Shoreline Stabilization	X		Wetland likely provides this function since it is vegetated adjacent to the lake.		Rating=Low Qualifiers: (1, 2)
Production of Organic Matter and its Export	X		Wetland vegetation is dominated by herbaceous vegetation. Wetland is adjacent to lake.		Rating=Low Qualifiers: (1)
General Habitat Suitability	X		Wetland is adjacent to the lake, but is bounded by development to the north, south and east.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	X		The wetland is sloped and generally saturated only. May provide some habitat in ditches.		Rating=Low Qualifiers: (1, 6)
Habitat for Amphibians	X		The wetland is sloped and generally saturated only. However, a seasonal stream does flow through the wetland.		Rating=Low Qualifiers: (1, 6)
Habitat for Wetland-Associated Mammals		X	Wetland does not have permanent standing water.		
Habitat for Wetland-Associated Birds		X	The wetland lacks the required inundation to emergent vegetation ratio.		
General Fish Habitat	X		Wetland likely provides some temporary refuge for some small fish near lake edge.		Rating=Low Qualifiers: (1, 4)
Native Plant Richness		X	Nonnative species (<i>Phalaris arundinacea</i>) is dominant in wetland.		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

Wetland Functions & Values Form

Wetland I.D. 33B Project: ELST Re-delineation Assessed by: Erik Christensen

Cowardin Class: PEM Ecology Category: III Local Rating: III Wetland size: 0.01 acre Date: 11/15/07

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration		X	Wetland is a saturated slope with a ditch at the toe and has little flood water capacity		
Sediment Removal		X	Wetland is a saturated slope with a ditch at the toe. Little ponding occurs in the ditch.		
Nutrient & Toxicant Removal		X	Wetland is a saturated slope with a ditch at the toe. Ditch is piped directly to Lake Sammamish and little ponding or water retention occurs.		
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a water course of shoreline.		
Production of Organic Matter and its Export	X		Wetland is densely covered with herbaceous vegetation. A culvert drains the ditch at the toe of the slope to Lake Sammamish.		Rating=Low Qualifiers: (1, 6)
General Habitat Suitability		X	Wetland is surrounded by residential development and dominated by <i>Rubus armeniacus</i> and <i>Phalaris arundinacea</i> .		
Habitat for Aquatic Invertebrates	X		Wetland is seasonally ponded and is vegetated by emergent vegetation in the ditch.		Rating=Low Qualifiers: (1, 4)
Habitat for Amphibians	X		Wetland is seasonally ponded and is vegetated by emergent vegetation in the ditch.		Rating=Low Qualifiers: (1, 2)
Habitat for Wetland-Associated Mammals		X	No permanent inundation occurs in the wetland.		
Habitat for Wetland-Associated Birds		X	No open water occurs in the wetland.		
General Fish Habitat		X	Wetland is not associated with a fish bearing stream.		
Native Plant Richness		X	Dominant vegetation in wetland is <i>Phalaris arundinacea</i> .		
Educational or Scientific Value		X	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		X	No documented protected species or habitat; not determined significant by local jurisdiction.		

APPENDIX D
Critical Area Impact Figures

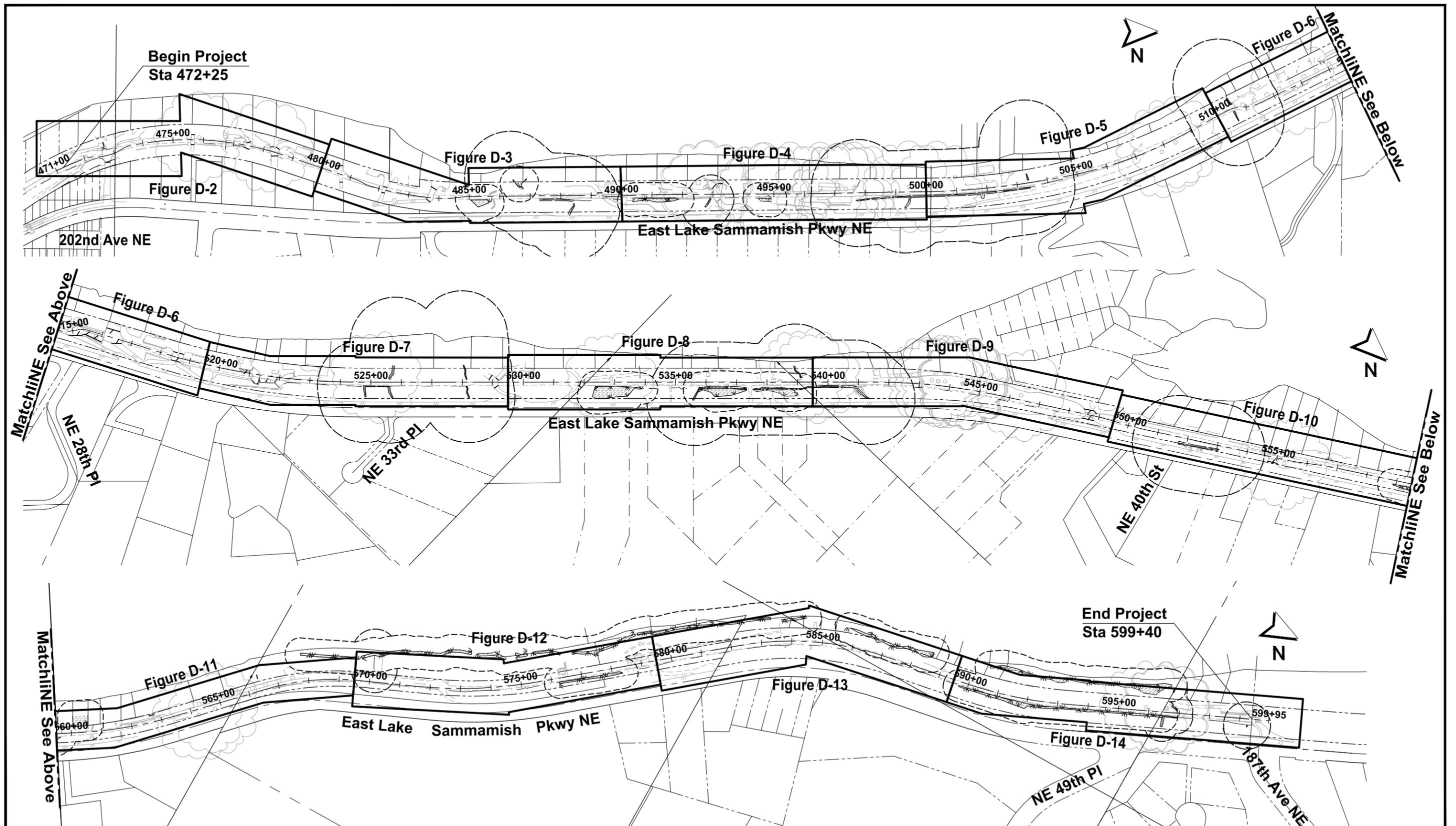
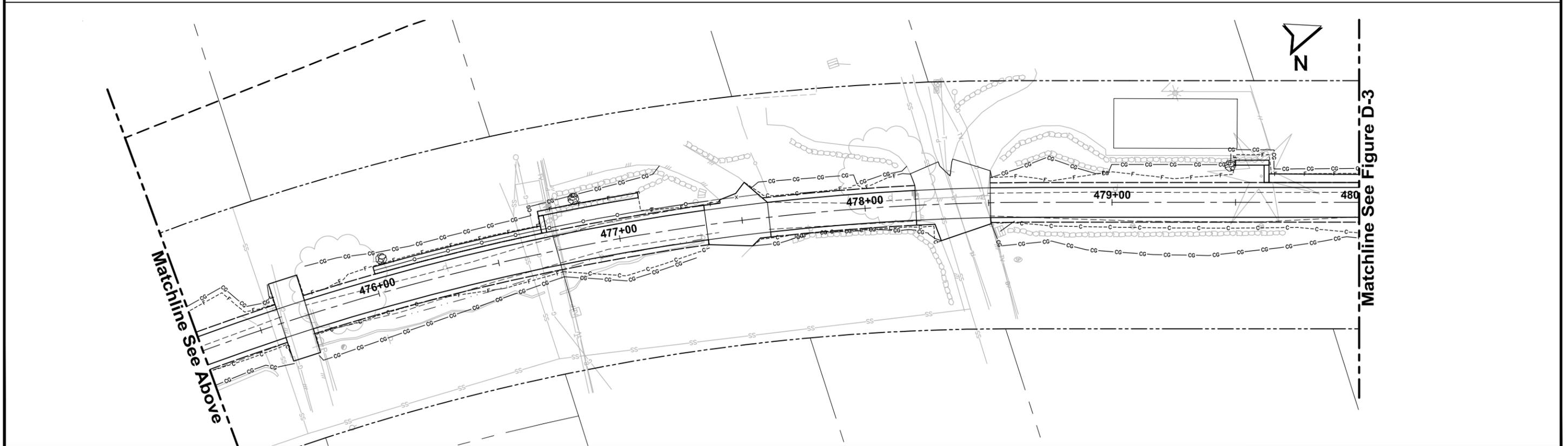
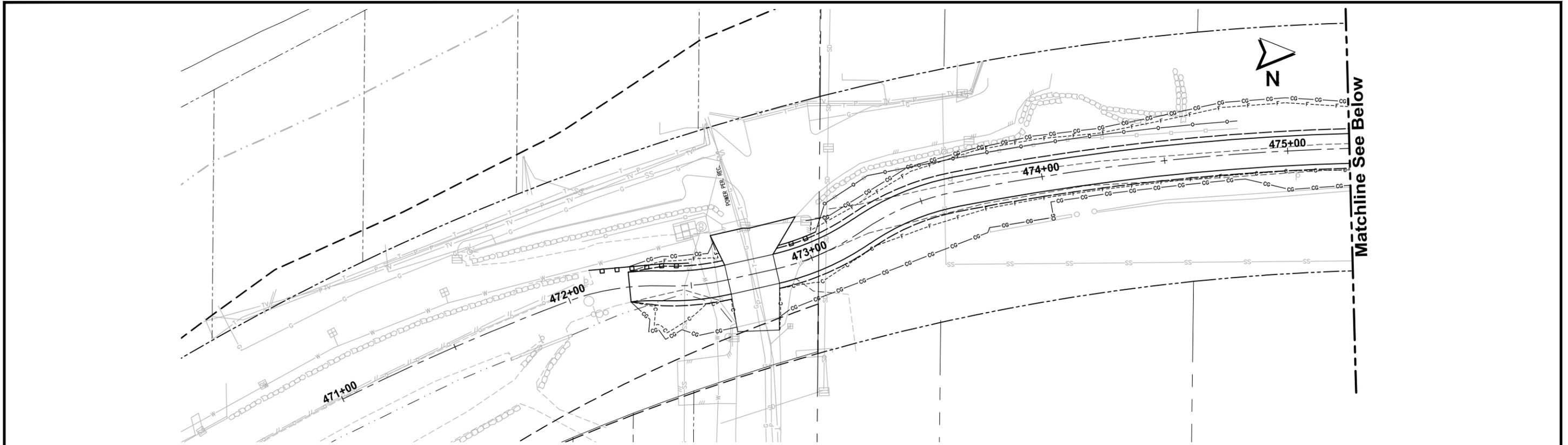


Figure D-1
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



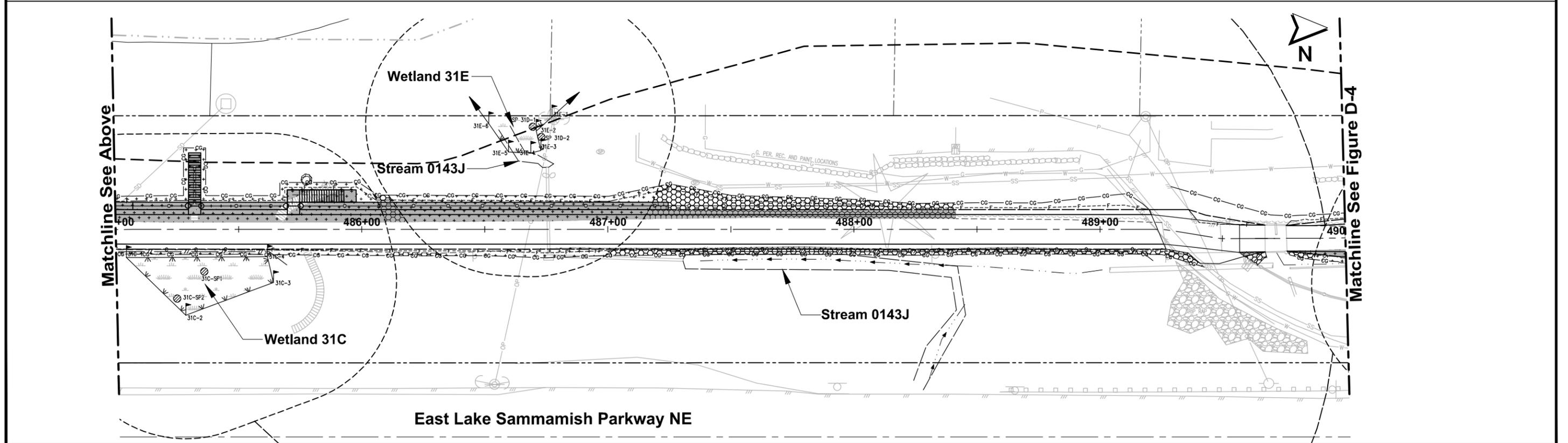
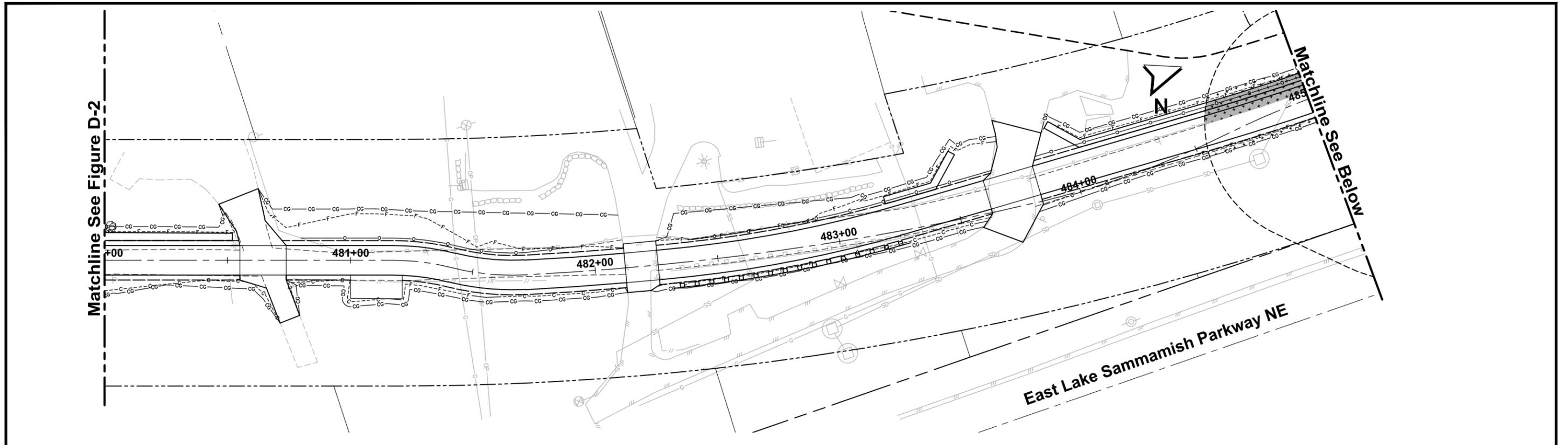
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Legend:

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	Wetland Flag		Ditch		Cut Limit		Temp. Stream Impact
	Wetland Boundary		Right of Way		Clearing/Grubbing Limit		Perm. Stream Buffer Impact
	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-2
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



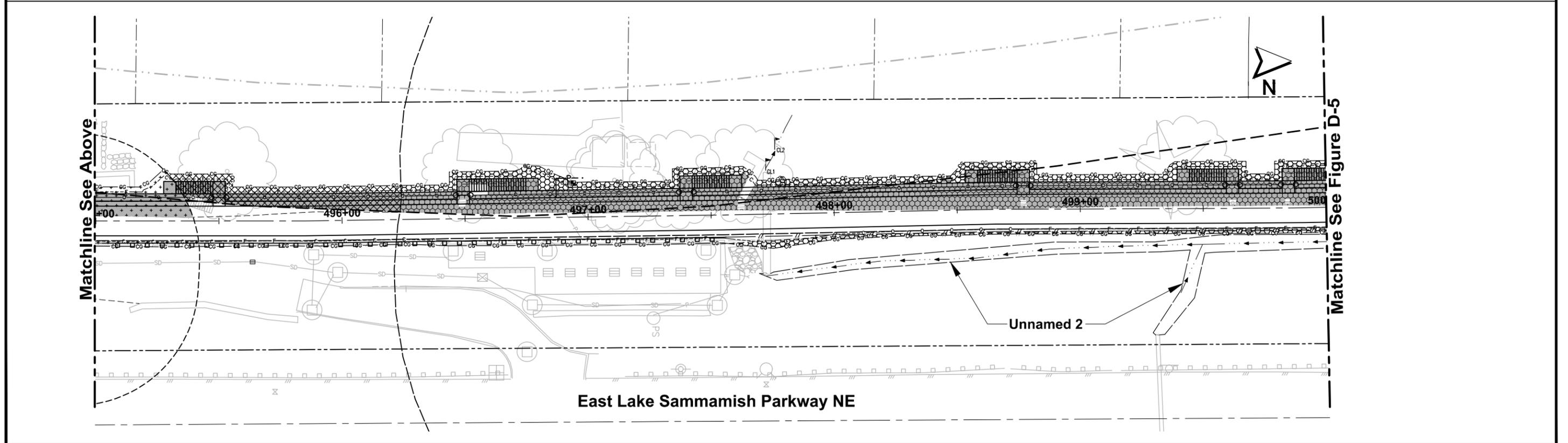
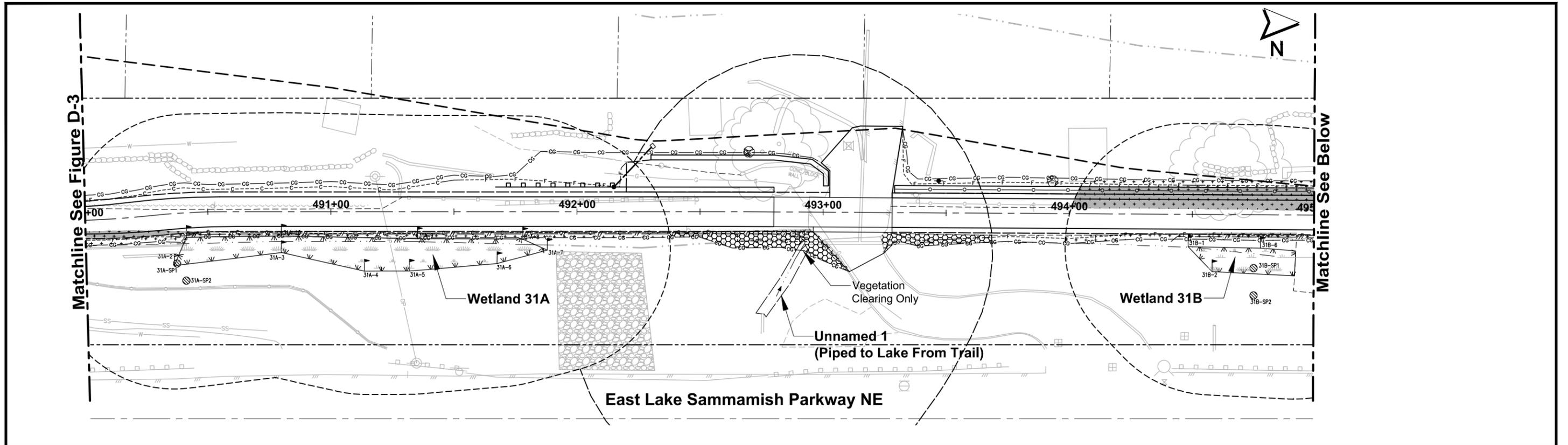
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	Wetland Boundary		Right of Way		Clearing/Grubbing Limit		Perm. Stream Buffer Impact
	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-3
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



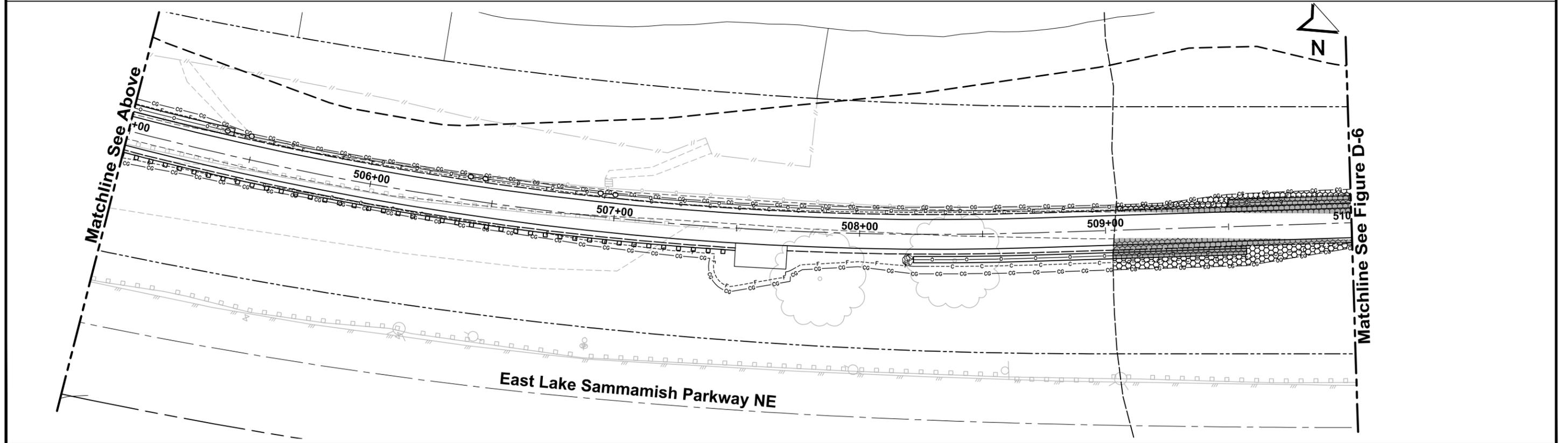
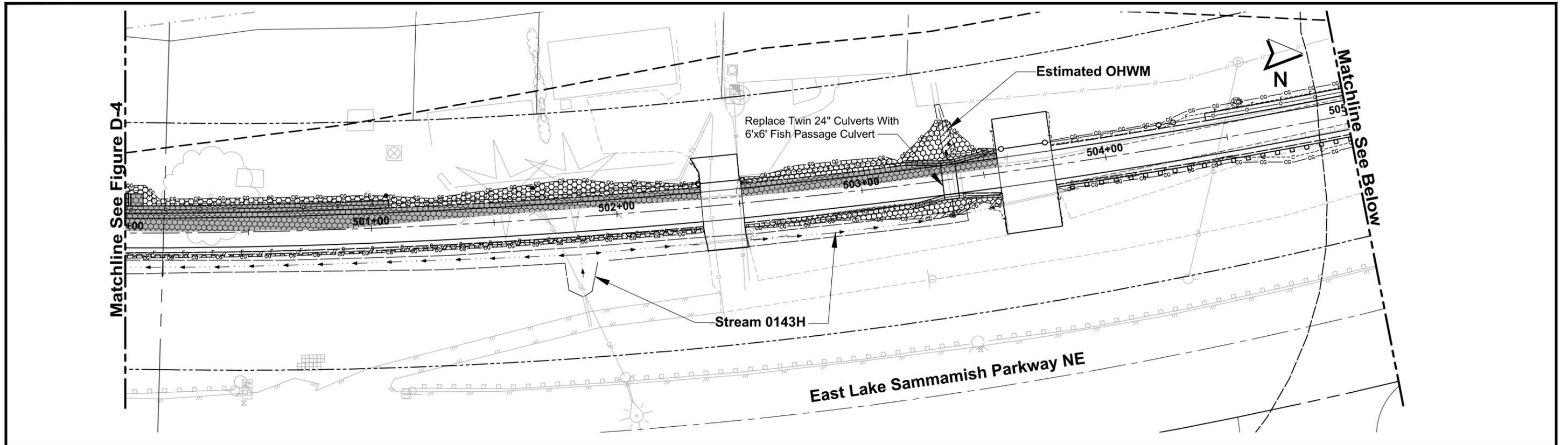
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	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact

Figure D-4
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment





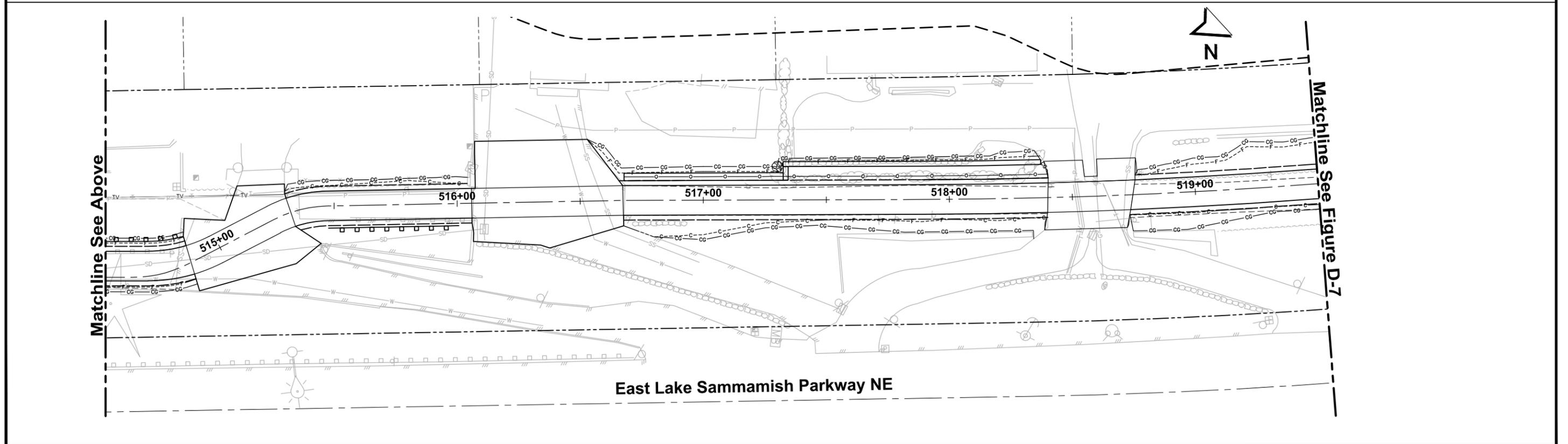
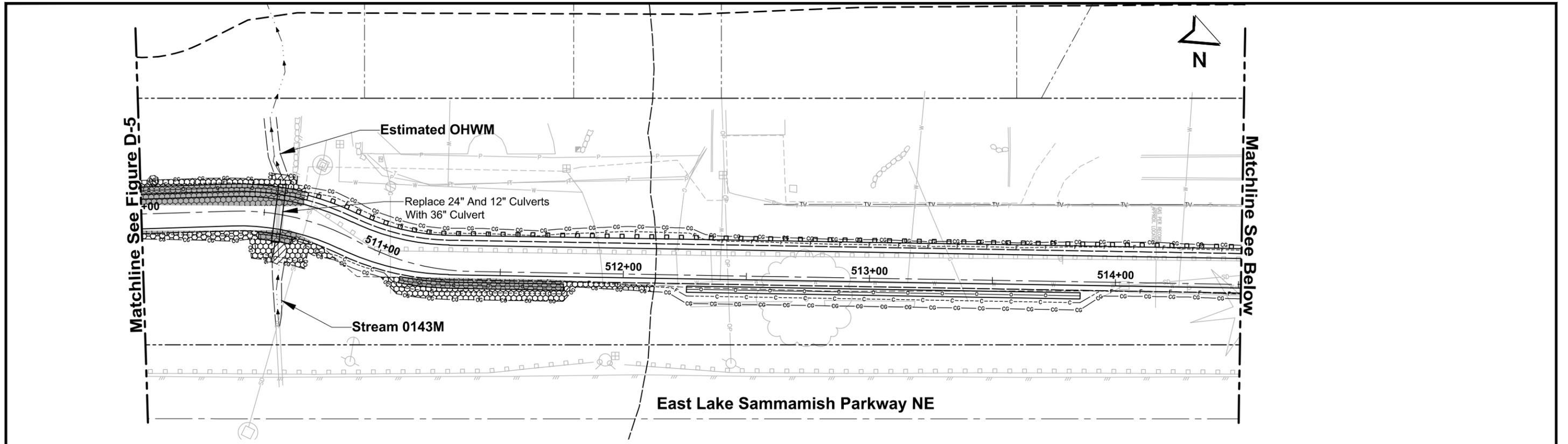
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	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-5
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



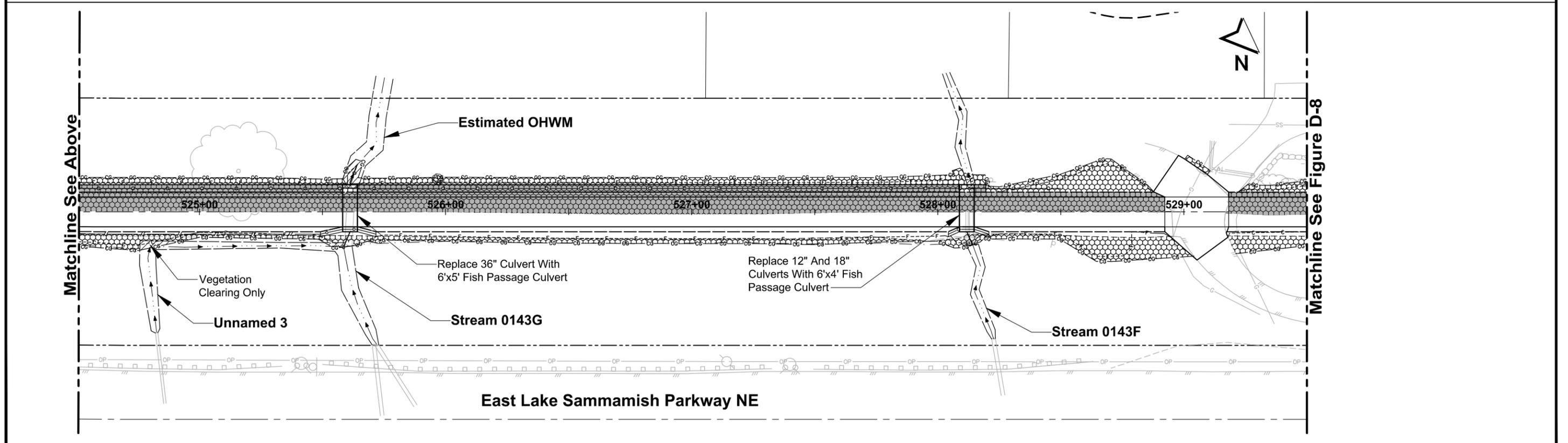
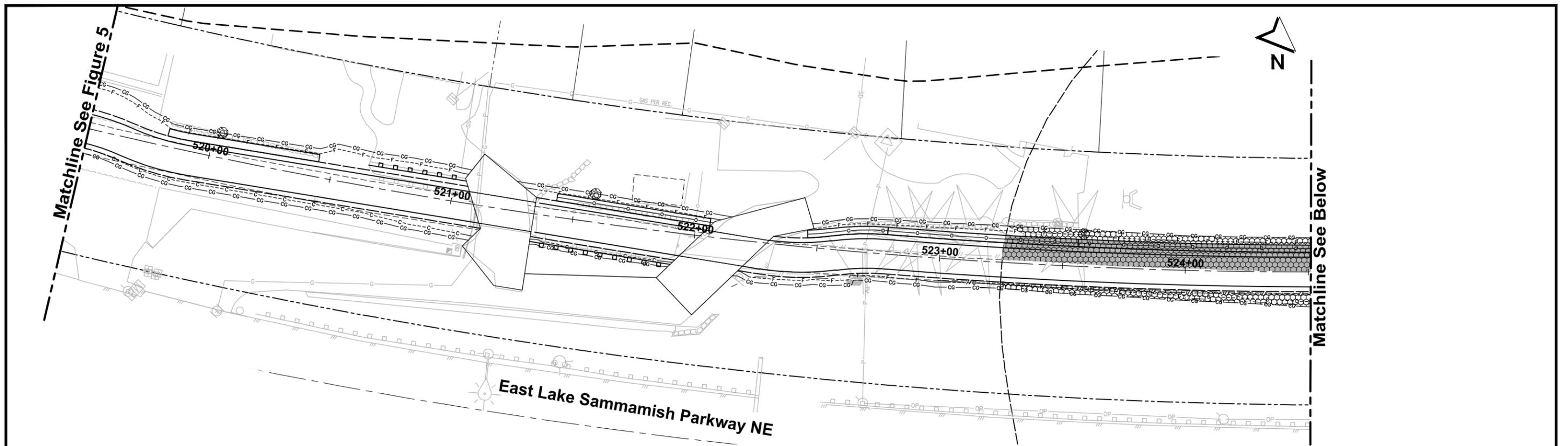
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	Wetland Boundary		Right of Way		Clearing/Grubbing Limit		Perm. Stream Buffer Impact
	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-6
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



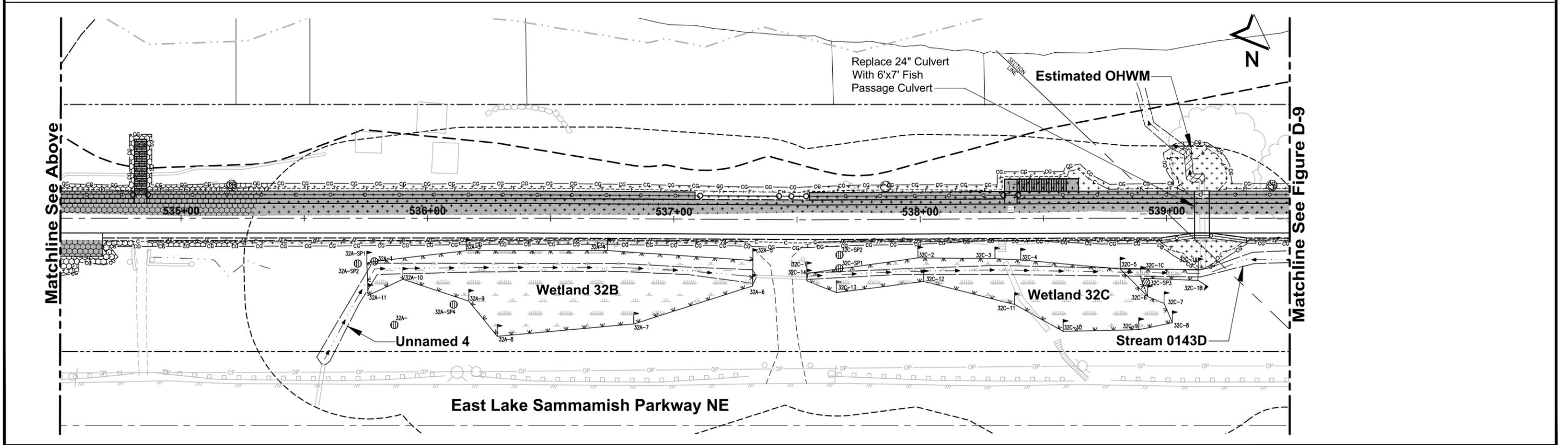
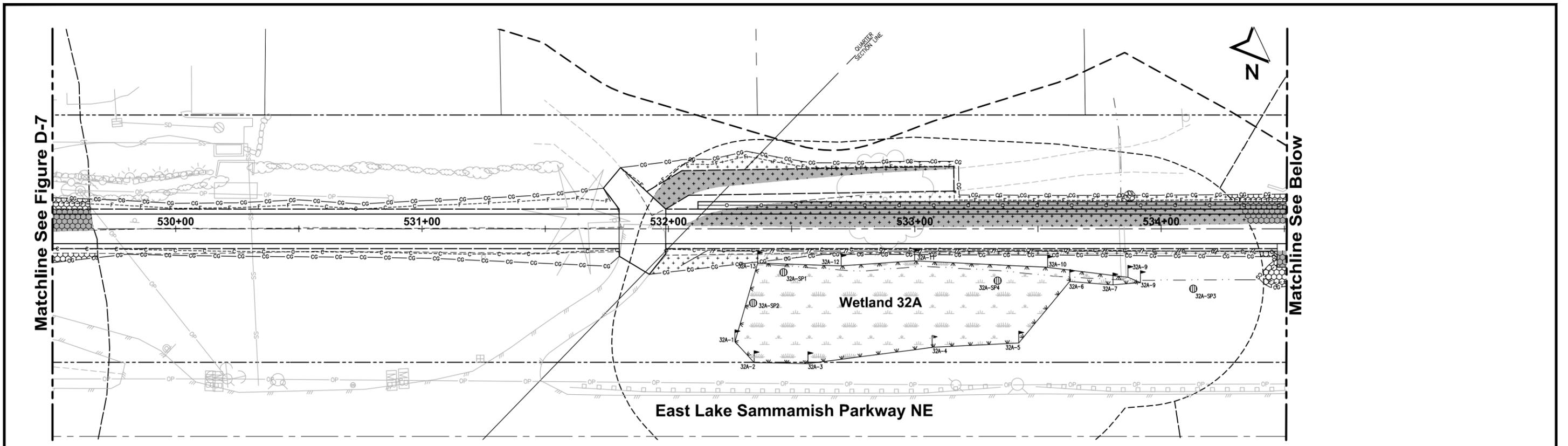
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	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-7
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



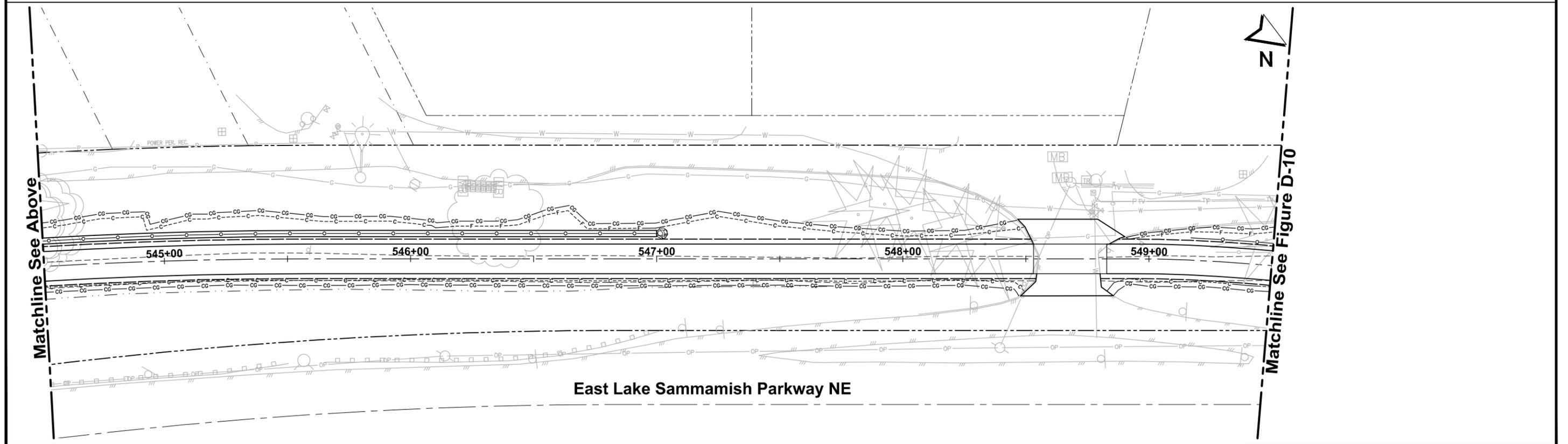
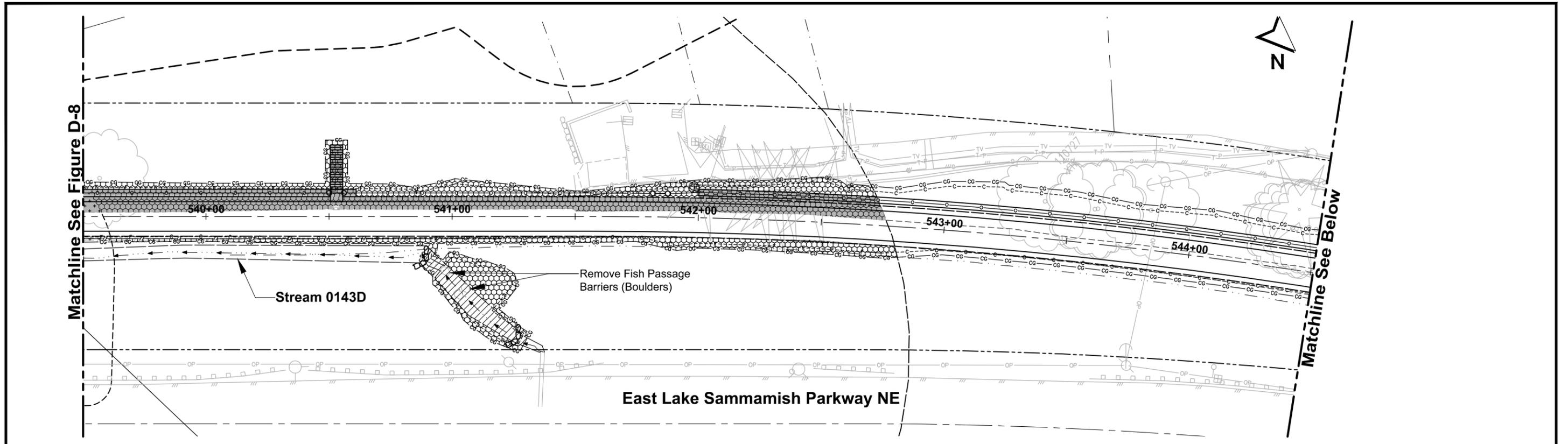
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| | Wetland Flag | | Ditch | | Cut Limit | | Temp. Stream Impact |
| | Wetland Boundary | | Right of Way | | Clearing/Grubbing Limit | | Perm. Stream Buffer Impact |
| | Wetland Buffer | | Lake OHWM | | Temp. Wetland Impact | | Temp. Stream Buffer Impact |
| | Stream Buffer | | Shoreline Setback | | Perm. Wetland Buffer Impact | | Perm. Shoreline Setback Impact |
| | Stream OHWM | | Retaining Walls | | Temp. Wetland Buffer Impact | | Temp. Shoreline Setback Impact |



Figure D-8
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



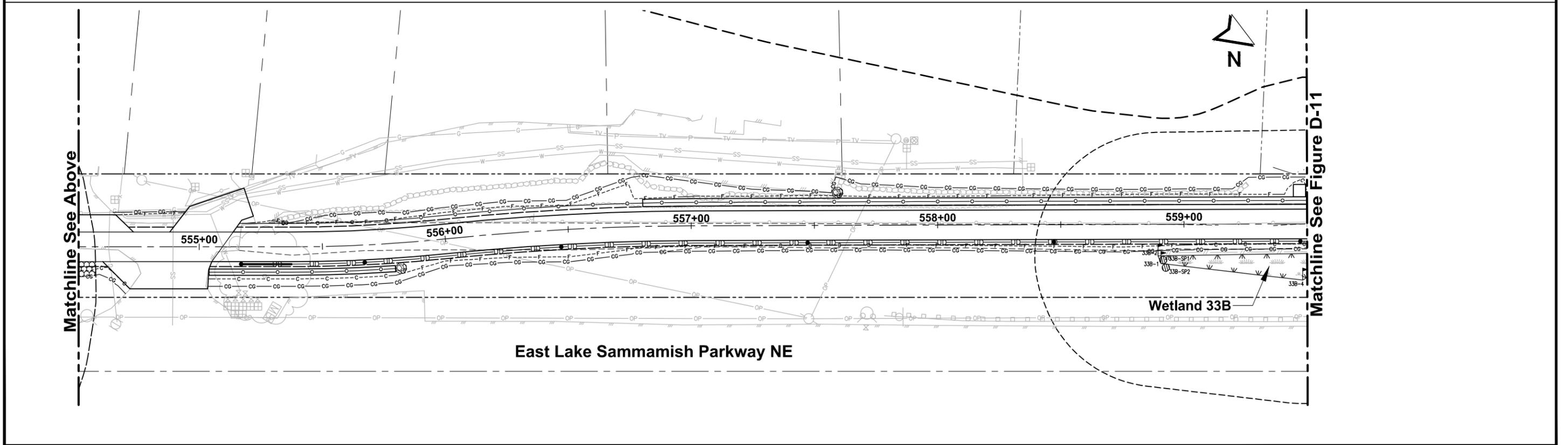
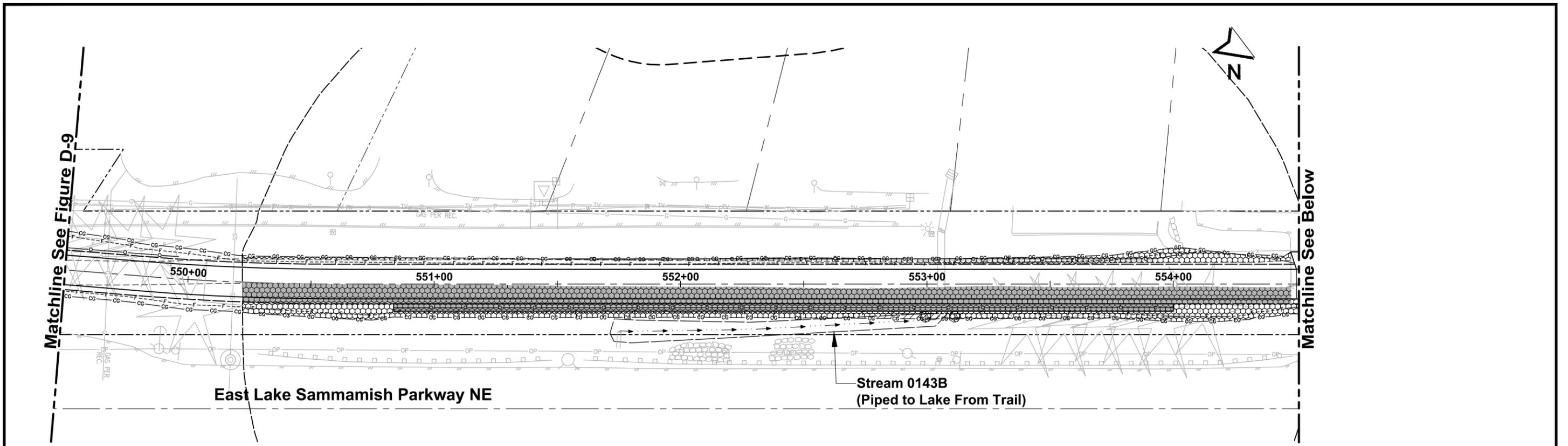
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	Wetland Flag		Ditch		Cut Limit		Temp. Stream Impact
	Wetland Boundary		Right of Way		Clearing/Grubbing Limit		Perm. Stream Buffer Impact
	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-9
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



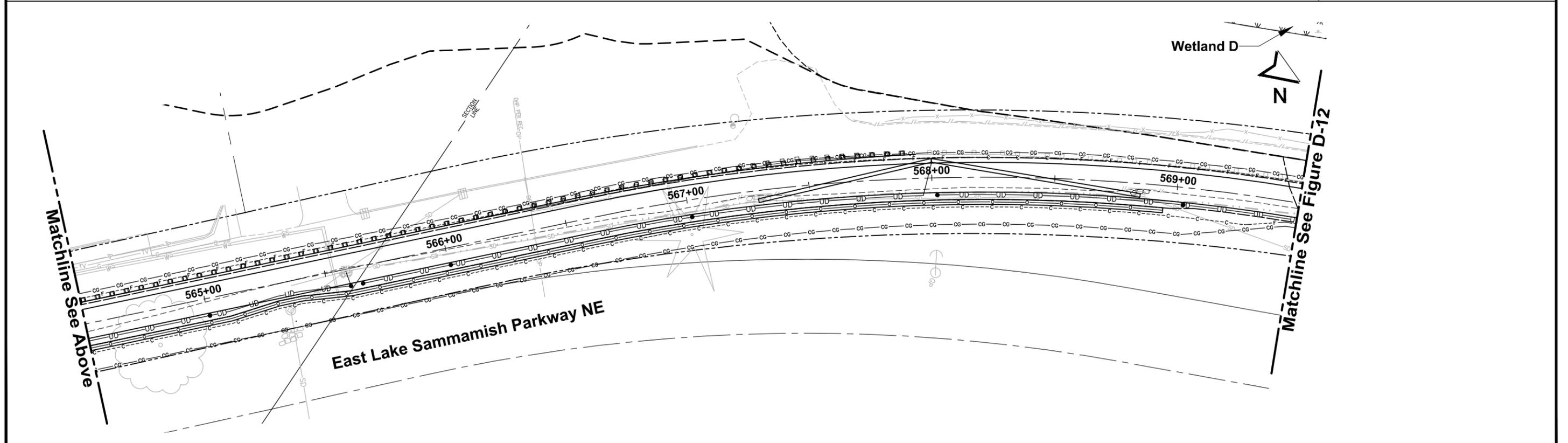
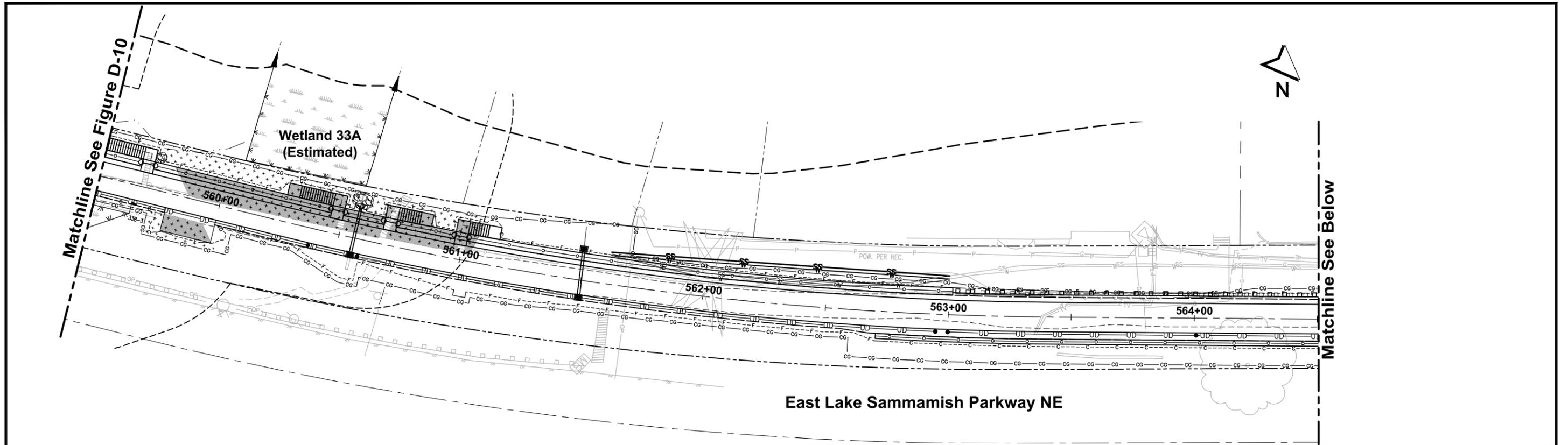
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	Wetland Boundary		Right of Way		Clearing/Grubbing Limit		Perm. Stream Buffer Impact
	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-10
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



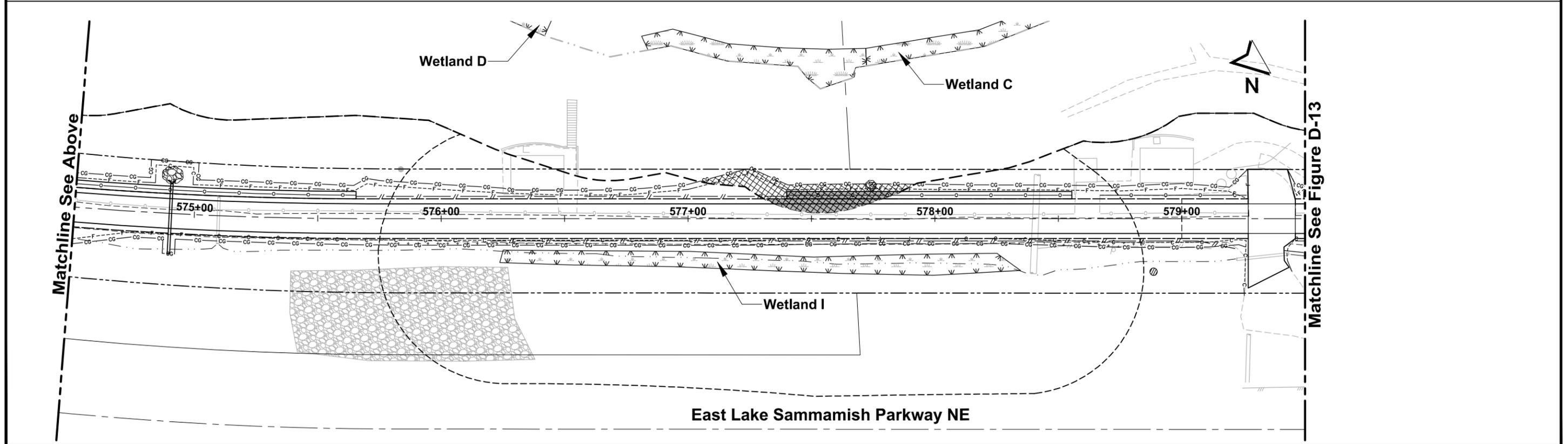
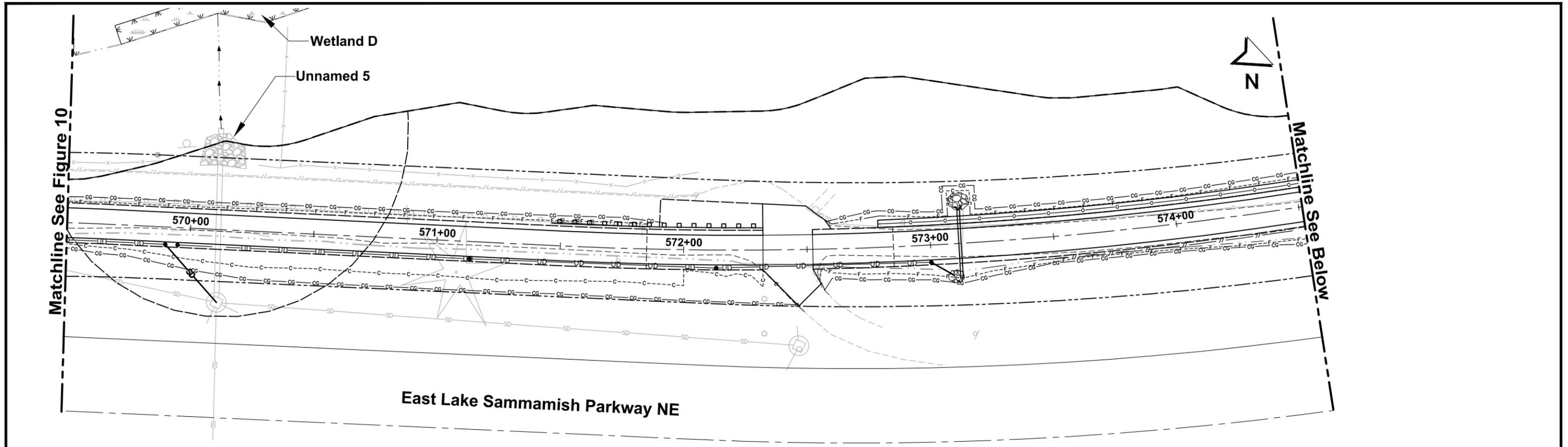
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	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-11
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



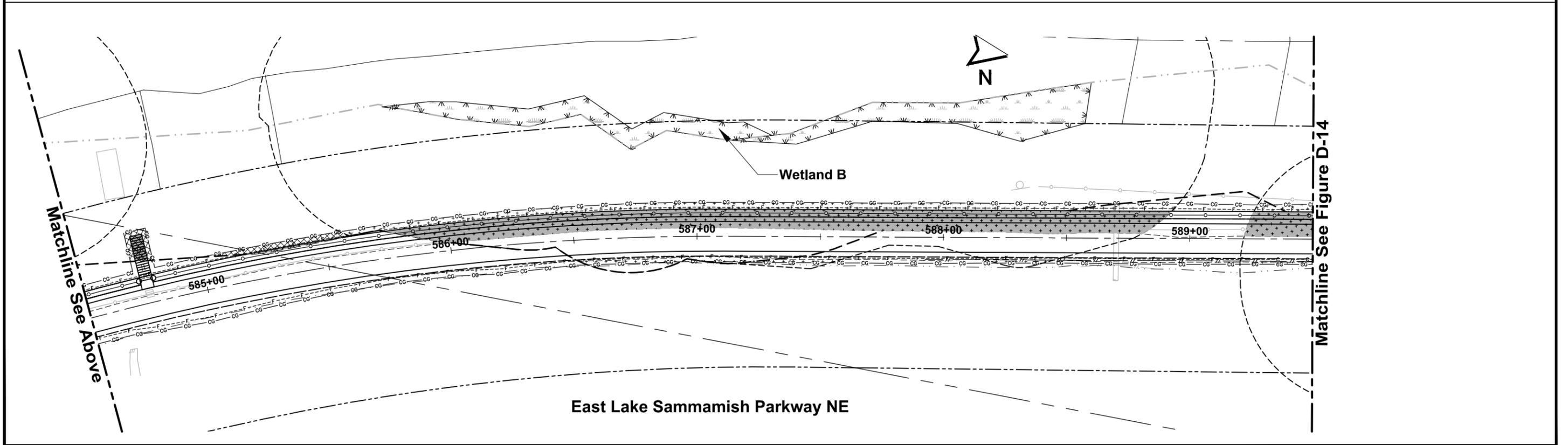
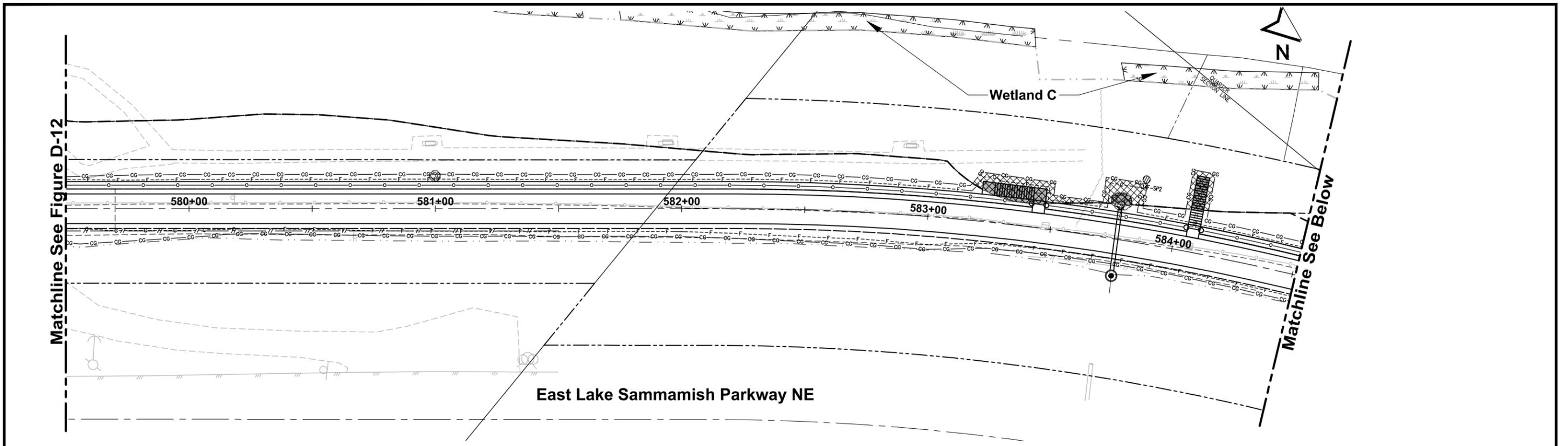
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	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-12
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



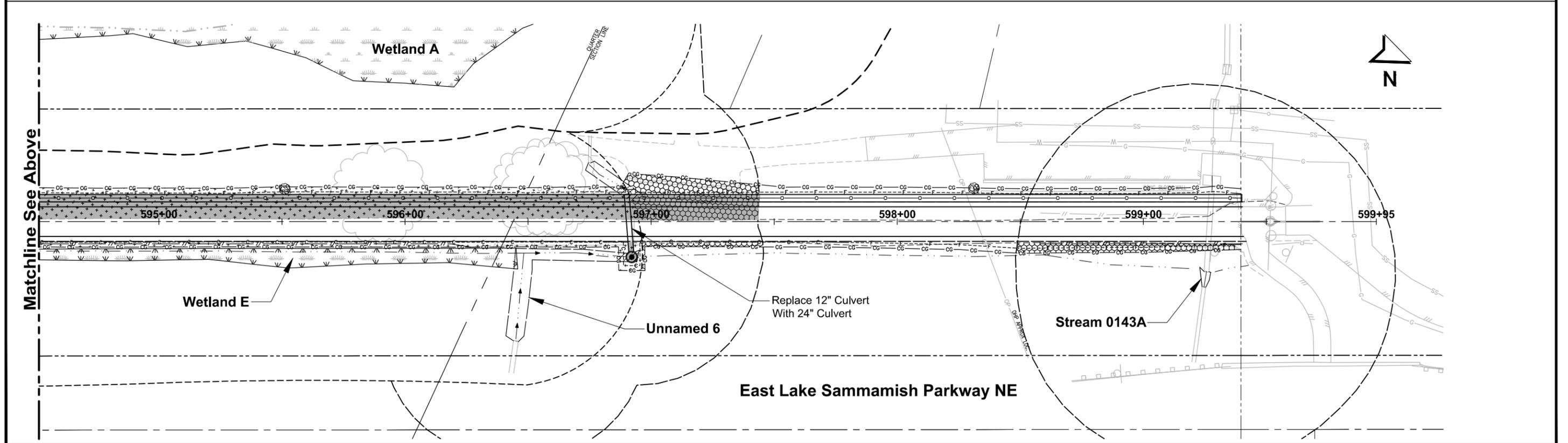
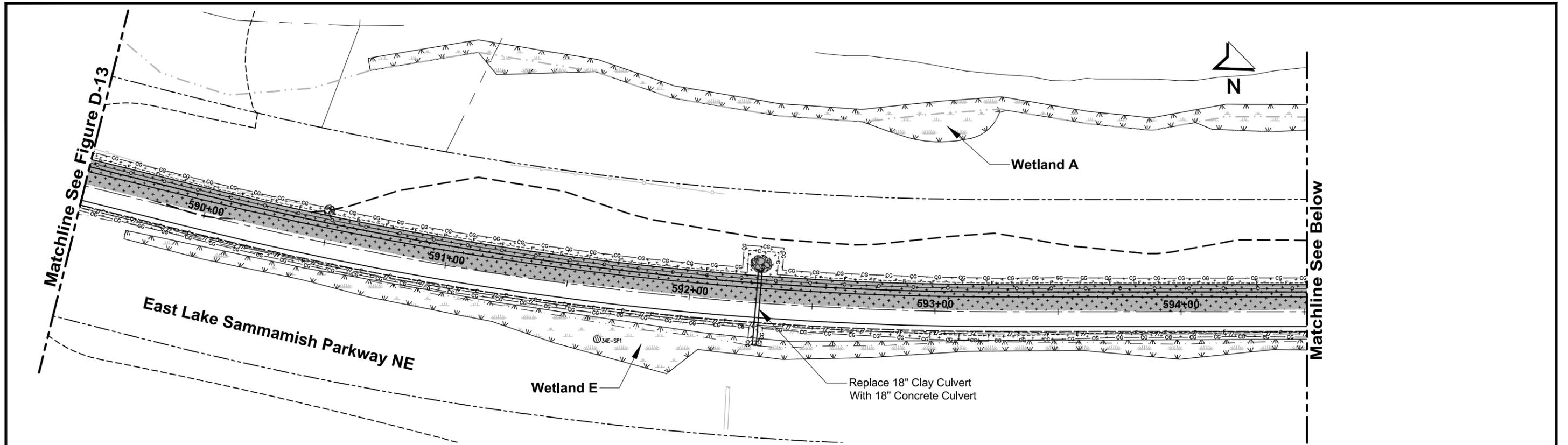
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	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-13
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment



Parametrix DATE: February 22, 2013 FILE: BL1521075P15T13F-D12-14

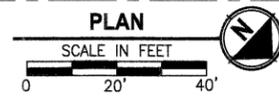
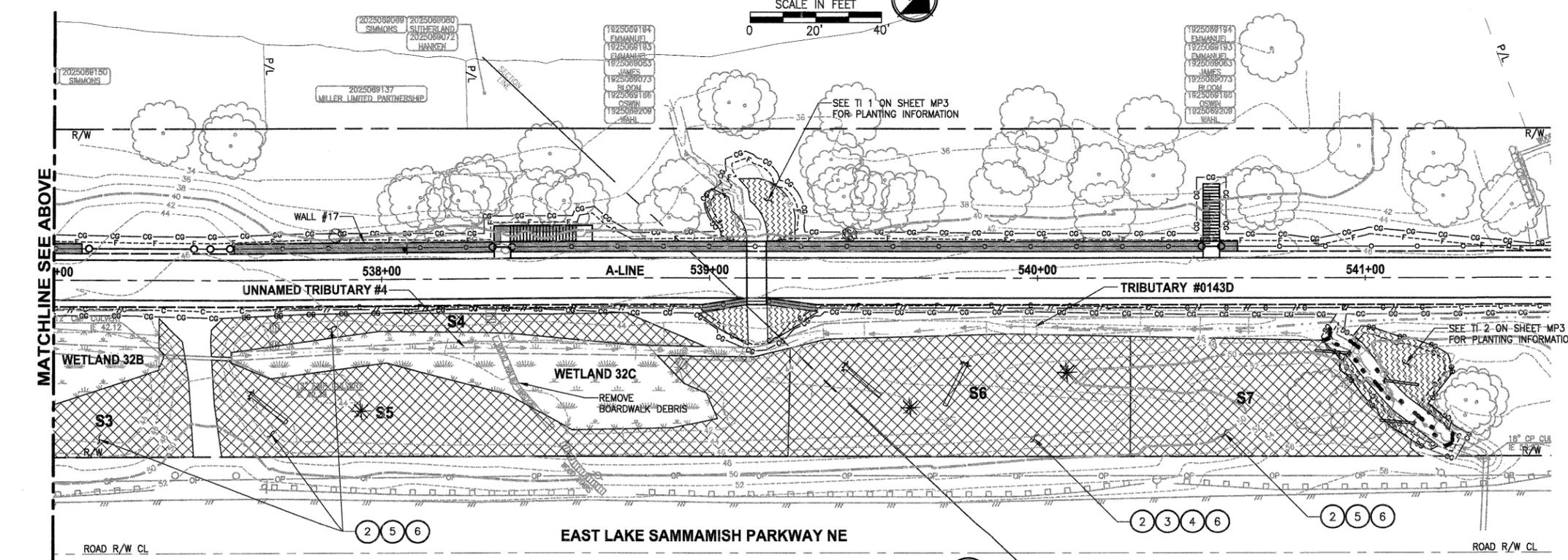
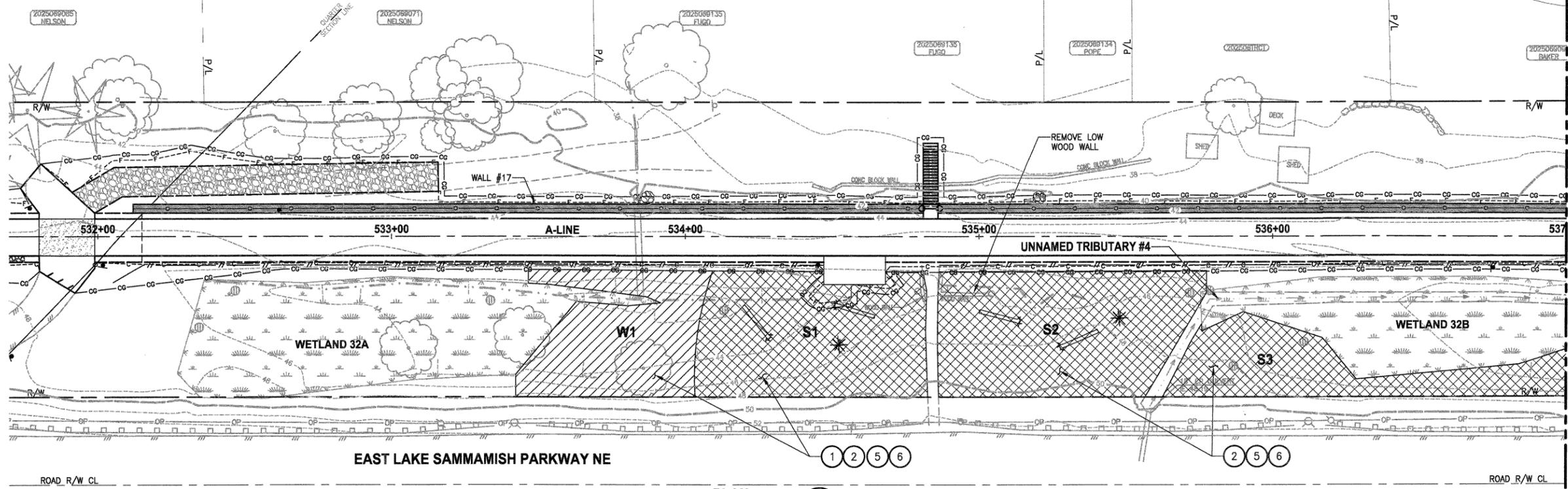
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	Wetland Boundary		Right of Way		Clearing/Grubbing Limit		Perm. Stream Buffer Impact
	Wetland Buffer		Lake OHWM		Temp. Wetland Impact		Temp. Stream Buffer Impact
	Stream Buffer		Shoreline Setback		Perm. Wetland Buffer Impact		Perm. Shoreline Setback Impact
	Stream OHWM		Retaining Walls		Temp. Wetland Buffer Impact		Temp. Shoreline Setback Impact



Figure D-14
Critical Area Impacts
East Lake Sammamish Master Plan Trail
North Sammamish Segment

APPENDIX E
Critical Area Mitigation



- CONSTRUCTION NOTES:**
- 1 HERBICIDE TREATMENT. TREAT TO CONTROL KNOTWEED AND OTHER UNWANTED VEGETATION WITHIN THIS PLANTING AREA WITH A NON-SELECTIVE HERBICIDE, MOW CLEAR AND DISPOSE OF ALL UNWANTED VEGETATION AND TREAT WITH HERBICIDE A SECOND TIME. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
 - 2 MITIGATION CLEARING AND GRUBBING. STAKE OR FLAG LOCATIONS AND LIMITS PROPOSED FOR CLEARING FOR APPROVAL OF PROJECT REPRESENTATIVE PRIOR TO STARTING CLEARING WORK. CLEAR AND GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN THIS PLANTING AREA. LEAVE SOIL IN PLACE. SEE SPECIFICATION FOR LIST OF UNWANTED VEGETATION.
 - 3 SOIL AMENDMENT. PLACE 3" SOIL AMENDMENT AND TILL INTO SOIL TO A DEPTH OF 10" IN THIS PLANTING AREA. SEE DETAIL 6 ON SHEET MP4.
 - 4 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE 1" COMPOST OVER ENTIRE SURFACE OF THIS PLANTING AREA.
 - 5 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE 3" COMPOST OVER ENTIRE SURFACE OF THIS PLANTING AREA.
 - 6 WOOD CHIP MULCH. PLACE 3" LAYER WOOD CHIP MULCH OVER THE ENTIRE SURFACE OF THIS PLANTING AREA.

- GENERAL NOTES:**
1. SEE SHEET MP4 FOR PLANTING DETAILS AND REQUIREMENTS.
 2. LOOSEN ANY SOILS IN PLANTING AREAS COMPACTED BY CONSTRUCTION ACTIVITIES BY RIPPING OR TILLING THE AREA TO A DEPTH OF 24".
 3. PLANTING AREA LIMITS AND INTERPLANTING LOCATIONS SHALL BE STAKED IN THE FIELD AND APPROVED BY PROJECT REPRESENTATIVE PRIOR TO PLANTING. COORDINATE DATA WILL BE PROVIDED ELECTRONICALLY FOR LOCATION OF PLANTING AREA BOUNDARIES.
 4. ALL PLANTS TO BE SAVED AND PROTECTED WITHIN MITIGATION CLEARING AND GRUBBING AREAS WILL BE FLAGGED BY PROJECT REPRESENTATIVE. NOTIFY ENGINEER 5 DAYS PRIOR TO START OF CLEARING ACTIVITY. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRIPLINE AREA OF EXISTING TREES AND SHRUBS.
 5. ANY CHANGES TO PLANT MATERIAL, SIZE, OR SPACING MUST BE APPROVED BY THE PROJECT REPRESENTATIVE PRIOR TO INSTALLATION.

- LEGEND:**
- HABITAT LOG. SEE DETAIL ON SHEET MP4.
 - BRUSH PILE. SEE DETAIL ON SHEET MP4.

PLANTING QUANTITY TAB - THIS SHEET ONLY -

SYMBOL	ITEM	QUANTITY BY AREA						
		S1	S2	S3	S4	S5	S6	S7
	STREAM BUFFER ENHANCEMENT PLANTING AREA	3,308 SF	3,543 SF	3,086 SF	1,043 SF	3,742 SF	3,778 SF	2,750 SF
	SHRUBS 4' O.C.	18	19	8	10	31	7	7
	VINE MAPLE	27	19	8	8	10	31	7
	WESTERN HAZEL	18	19	17	6	20	20	7
	OCEAN SPRAY	18	19	8	6	20	20	7
	INDIAN PLUM	45	38	25	14	30	51	30
	NOOTKA ROSE	45	38	25	14	30	51	30
	SNOWBERRY	45	38	25	14	30	51	30
	TREES 8' O.C.	12	13	11	4	14	14	2
	BIG LEAF MAPLE	6	6	6	2	7	7	2
	WESTERN SERVICEBERRY	9	6	6	2	7	7	2
	PACIFIC DOGWOOD	6	6	6	2	7	7	2
	BITTER CHERRY	12	13	11	4	14	14	2
	DOUGLAS FIR	3	3	3	2	3	7	2
	SCOUERS WILLOW	-	-	-	-	-	-	-
	WESTERN RED CEDAR	-	-	-	-	-	-	-
	WESTERN HEMLOCK	12	13	11	4	14	14	2
	WETLAND BUFFER ENHANCEMENT PLANTING AREA	2,213 SF						
	SHRUBS 4' O.C.	12						
	VINE MAPLE	18						
	WESTERN HAZEL	12						
	OCEAN SPRAY	6						
	INDIAN PLUM	24						
	NOOTKA ROSE	24						
	SNOWBERRY	24						
	TREES 8' O.C.	4						
	BIG LEAF MAPLE	4						
	WESTERN SERVICEBERRY	2						
	PACIFIC DOGWOOD	2						
	BITTER CHERRY	4						
	DOUGLAS FIR	4						
	SCOUERS WILLOW	4						
	WESTERN RED CEDAR	4						
	WESTERN HEMLOCK	4						

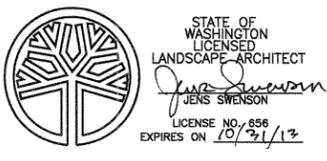
KING COUNTY DPER APPROVAL

Review Engineer	Date
Senior Engineer	Date
Molly A. Johnson, P.E. DEVELOPMENT ENGINEER	Date

REVISIONS	DATE	BY	DESIGNED	DRAWN	CHECKED	APPROVED
			J. SWENSON	B. PURGANAN	J. SWENSON	

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FILE NAME: BL1521075P15T03MP-01
JOB No. 554-1521-075-P15T04B
DATE: MARCH 2013



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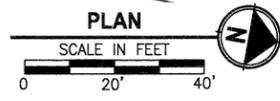
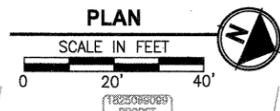
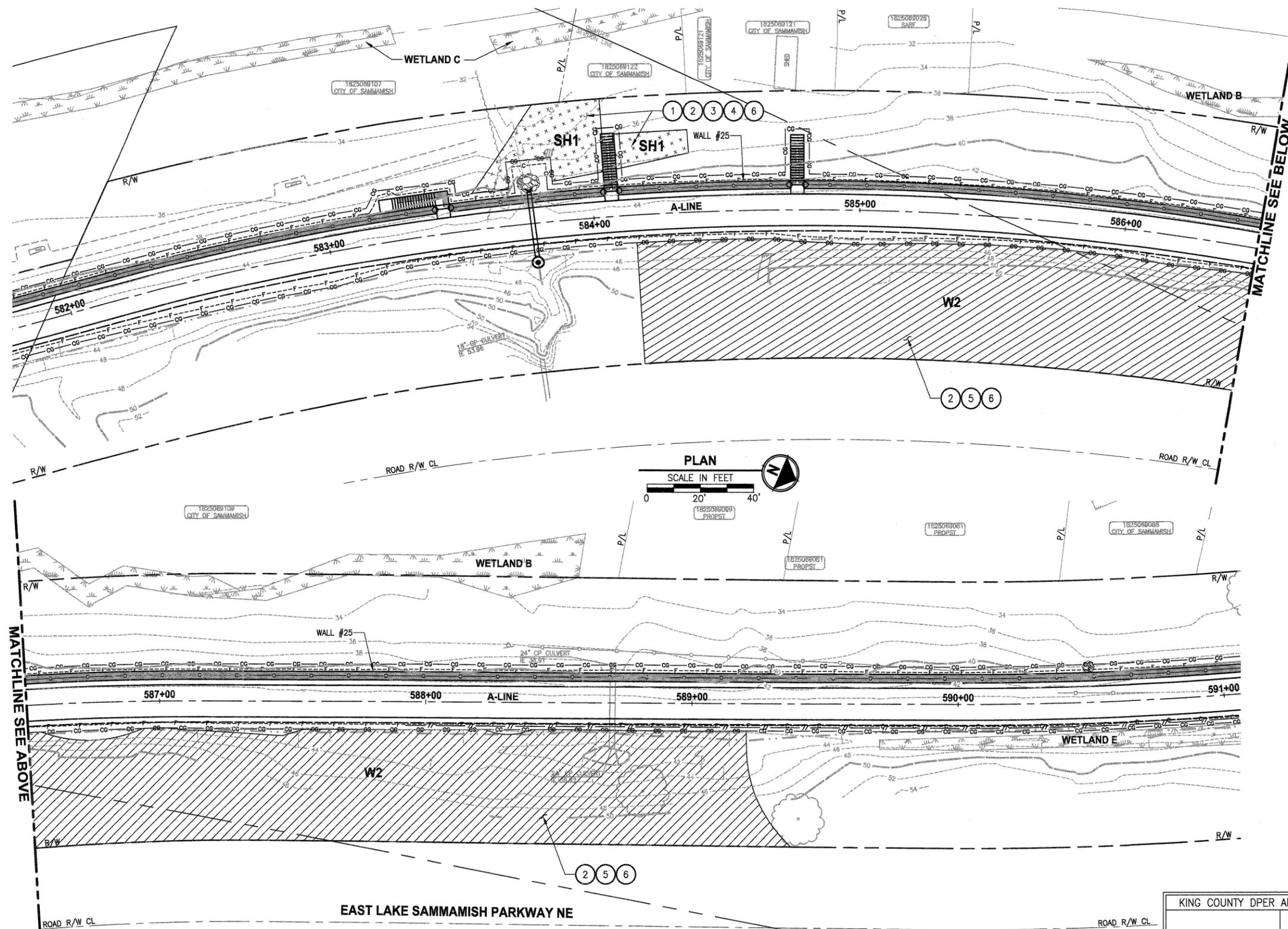
PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL NORTH SAMMAMISH SEGMENT
SAMMAMISH, WA

MITIGATION PLAN

SHEET NO.
120 OF 124
MP1

LAYOUT: MP1 PATH: U:\Ball\Projects\Clients\1521-075-ELST\985\va\CA03\Phase 15\Task 03.Dwg PLOTTED BY: sireaste DATE: Tuesday, March 05, 2013 11:35:18 AM

SEC'S 18, 19, 20, 29 TWP. 25 N., RGE. 06 E, W.M.



CONSTRUCTION NOTES:

- 1 HERBICIDE TREATMENT. TREAT TO CONTROL KNOTWEED AND OTHER UNWANTED VEGETATION WITHIN THIS PLANTING AREA WITH A NON-SELECTIVE HERBICIDE, MOW CLEAR AND DISPOSE OF ALL UNWANTED VEGETATION AND TREAT WITH HERBICIDE A SECOND TIME. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 2 MITIGATION CLEARING AND GRUBBING. STAKE OR FLAG LOCATIONS AND LIMITS PROPOSED FOR CLEARING FOR APPROVAL OF PROJECT REPRESENTATIVE PRIOR TO STARTING CLEARING WORK. CLEAR AND GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN THIS PLANTING AREA. LEAVE SOIL IN PLACE. SEE SPECIFICATION FOR LIST OF UNWANTED VEGETATION.
- 3 SOIL AMENDMENT. PLACE 3" SOIL AMENDMENT AND TILL INTO SOIL TO A DEPTH OF 10" IN THIS PLANTING AREA. SEE DETAIL 6 ON SHEET MP4.
- 4 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE 1" COMPOST OVER ENTIRE SURFACE OF THIS PLANTING AREA.
- 5 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE 3" COMPOST OVER ENTIRE SURFACE OF THIS PLANTING AREA.
- 6 WOOD CHIP MULCH. PLACE 3" LAYER WOOD CHIP MULCH OVER THE ENTIRE SURFACE OF THIS PLANTING AREA.

GENERAL NOTES:

1. SEE SHEET MP4 FOR PLANTING DETAILS AND REQUIREMENTS.
2. LOOSEN ANY SOILS IN PLANTING AREAS COMPACTED BY CONSTRUCTION ACTIVITIES BY RIPPING OR TILLING THE AREA TO A DEPTH OF 24".
3. PLANTING AREA LIMITS AND INTERPLANTING LOCATIONS SHALL BE STAKED IN THE FIELD AND APPROVED BY PROJECT REPRESENTATIVE PRIOR TO PLANTING. COORDINATE DATA WILL BE PROVIDED ELECTRONICALLY FOR LOCATION OF PLANTING AREA BOUNDARIES.
4. ALL PLANTS TO BE SAVED AND PROTECTED WITHIN MITIGATION CLEARING AND GRUBBING AREAS WILL BE FLAGGED BY PROJECT REPRESENTATIVE. NOTIFY ENGINEER 5 DAYS PRIOR TO START OF CLEARING ACTIVITY. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRIPLINE AREA OF EXISTING TREES AND SHRUBS.
5. ANY CHANGES TO PLANT MATERIAL, SIZE, OR SPACING MUST BE APPROVED BY THE PROJECT REPRESENTATIVE PRIOR TO INSTALLATION.

- LEGEND:**
- HABITAT LOG. SEE DETAIL ON SHEET MP4.
 - BRUSH PILE. SEE DETAIL ON SHEET MP4.

PLANTING QUANTITY TAB - THIS SHEET ONLY -

SYMBOL ITEM	QUANTITY BY AREA
SHORELINE BUFFER ENHANCEMENT PLANTING AREA SH1	1,212 SF
SHRUBS 4' O.C.	
VINE MAPLE	10
WESTERN HAZEL	10
OCEAN SPRAY	7
INDIAN PLUM	7
NOOTKA ROSE	16
SNOWBERRY	16
TREES 8' O.C.	
BIG LEAF MAPLE	5
WESTERN SERVICEBERRY	2
PACIFIC DOGWOOD	2
BITTER CHERRY	2
DOUGLAS FIR	5
WESTERN HEMLOCK	4
WETLAND BUFFER ENHANCEMENT PLANTING AREA W2	21,597 SF
SHRUBS 4' O.C.	
VINE MAPLE	117
WESTERN HAZEL	175
OCEAN SPRAY	117
INDIAN PLUM	117
NOOTKA ROSE	175
SNOWBERRY	175
TREES 8' O.C.	
BIG LEAF MAPLE	97
WESTERN SERVICEBERRY	39
PACIFIC DOGWOOD	39
BITTER CHERRY	39
DOUGLAS FIR	97
WESTERN HEMLOCK	78

KING COUNTY DPER APPROVAL

Review Engineer	Date
Senior Engineer	Date
Molly A. Johnson, P.E. DEVELOPMENT ENGINEER	Date

LAYOUT: MP2
 PATH: U:\Bell\Projects\Clients\1521-King_City\554-1521-075-ELST\98Sves\CADD\Phase 15\Task 03.Dwg
 PLOTTED BY: airesate DATE: Tuesday, March 05, 2013 11:34:34 AM

REVISIONS	DATE	BY	DESIGNED	DRAWN	CHECKED	APPROVED
			J. SWENSON	E. PURGANAN	J. SWENSON	

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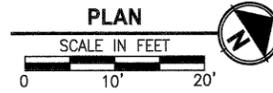
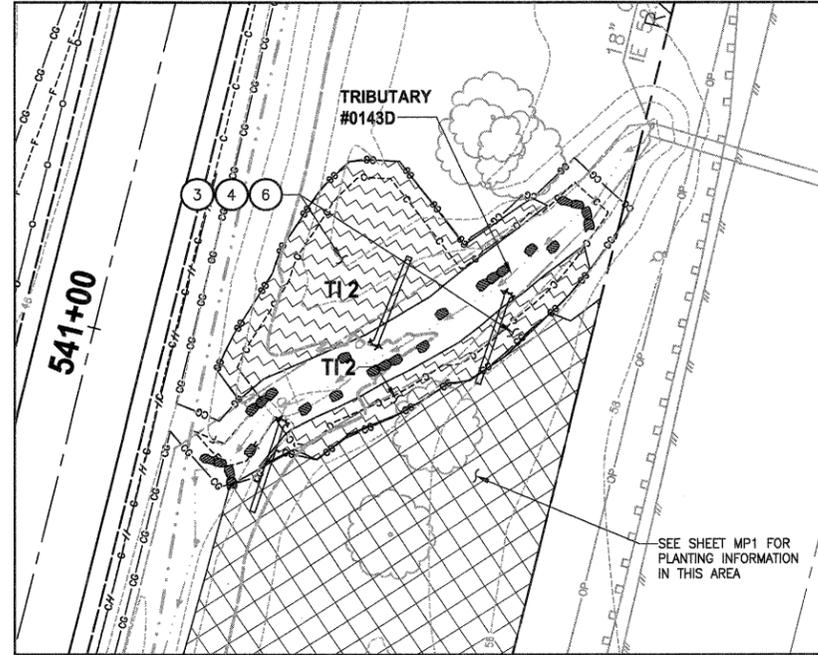
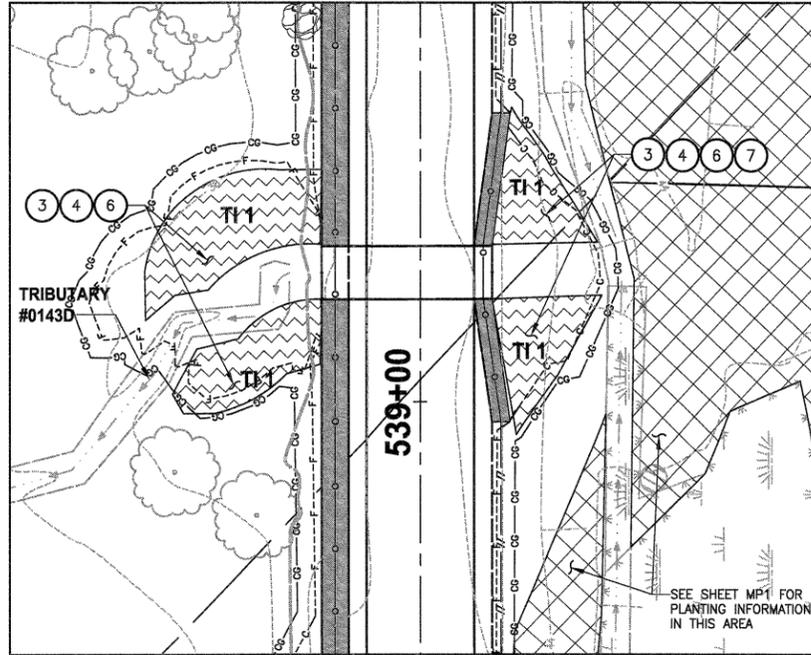


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PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL NORTH SAMMAMISH SEGMENT
 SAMMAMISH, WA

MITIGATION PLAN

SHEET NO.
 121 OF 124
MP2



CONSTRUCTION NOTES:

- 1 HERBICIDE TREATMENT. TREAT TO CONTROL KNOTWEED AND OTHER UNWANTED VEGETATION WITHIN THIS PLANTING AREA WITH A NON-SELECTIVE HERBICIDE, MOW CLEAR AND DISPOSE OF ALL UNWANTED VEGETATION AND TREAT WITH HERBICIDE A SECOND TIME. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 2 MITIGATION CLEARING AND GRUBBING. STAKE OR FLAG LOCATIONS AND LIMITS PROPOSED FOR CLEARING FOR APPROVAL OF PROJECT REPRESENTATIVE PRIOR TO STARTING CLEARING WORK. CLEAR AND GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN THIS PLANTING AREA. LEAVE SOIL IN PLACE. SEE SPECIFICATION FOR LIST OF UNWANTED VEGETATION.
- 3 SOIL AMENDMENT. PLACE 3" SOIL AMENDMENT AND TILL INTO SOIL TO A DEPTH OF 10" IN THIS PLANTING AREA. SEE DETAIL 6 ON SHEET MP4.
- 4 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE 1" COMPOST OVER ENTIRE SURFACE OF THIS PLANTING AREA.
- 5 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE 3" COMPOST OVER ENTIRE SURFACE OF THIS PLANTING AREA.
- 6 WOOD CHIP MULCH. PLACE 3" LAYER WOOD CHIP MULCH OVER THE ENTIRE SURFACE OF THIS PLANTING AREA.

GENERAL NOTES:

1. SEE SHEET MP4 FOR PLANTING DETAILS AND REQUIREMENTS.
2. LOOSEN ANY SOILS IN PLANTING AREAS COMPACTED BY CONSTRUCTION ACTIVITIES BY RIPPING OR TILLING THE AREA TO A DEPTH OF 24".
3. PLANTING AREA LIMITS AND INTERPLANTING LOCATIONS SHALL BE STAKED IN THE FIELD AND APPROVED BY PROJECT REPRESENTATIVE PRIOR TO PLANTING. COORDINATE DATA WILL BE PROVIDED ELECTRONICALLY FOR LOCATION OF PLANTING AREA BOUNDARIES.
4. ALL PLANTS TO BE SAVED AND PROTECTED WITHIN MITIGATION CLEARING AND GRUBBING AREAS WILL BE FLAGGED BY PROJECT REPRESENTATIVE. NOTIFY ENGINEER 5 DAYS PRIOR TO START OF CLEARING ACTIVITY. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRIPLINE AREA OF EXISTING TREES AND SHRUBS.
5. ANY CHANGES TO PLANT MATERIAL, SIZE, OR SPACING MUST BE APPROVED BY THE PROJECT REPRESENTATIVE PRIOR TO INSTALLATION.

LEGEND:

- HABITAT LOG. SEE DETAIL ON SHEET MP4.
- BRUSH PILE. SEE DETAIL ON SHEET MP4.

PLANTING QUANTITY TAB - THIS SHEET ONLY -			
SYMBOL	ITEM	QUANTITY BY AREA	
		T1	T2
TEMPORARY BUFFER IMPACT PLANTING AREA		500 SF	538 SF
SHRUBS 4' O.C.			
	VINE MAPLE	3	3
	CORNUS SERICEA	8	9
	WESTERN HAZEL	4	4
	INDIAN PLUM	4	4
	NOOTKA ROSE	4	4
	SNOWBERRY	4	4
TREES 8' O.C.			
	BIG LEAF MAPLE	1	1
	DOUGLAS FIR	2	2
	SCOULERS WILLOW	2	2
	SITKA WILLOW	3	3
	WESTERN RED CEDAR	2	2

KING COUNTY DPER APPROVAL	
Review Engineer _____	Date _____
Senior Engineer _____	Date _____
Wally A. Johnson, P.E. DEVELOPMENT ENGINEER	Date _____

LAYOUT: MP3 PATH: U:\Bell\Projects\Clients\1521-King On\1521-075-ELST\98Secs\CADD\Phase 15\Task 03\Drawn\ PLOTTED BY: airesate DATE: Tuesday, March 05, 2013 11:35:52 AM

REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			B. PURGANAN
			J. SWENSON
			APPROVED

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 J. Swenson
 JENIS SWENSON
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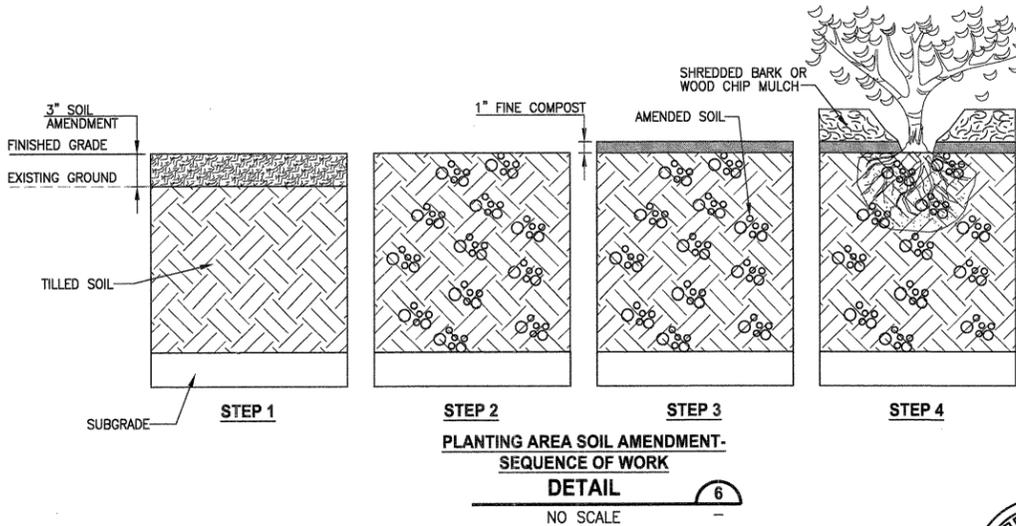
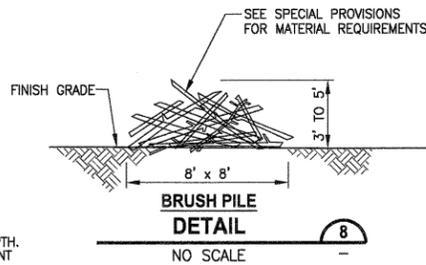
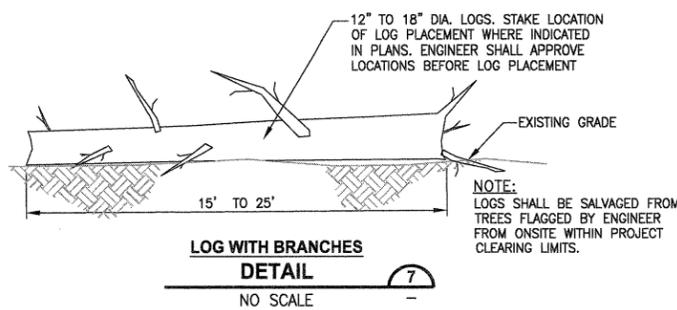
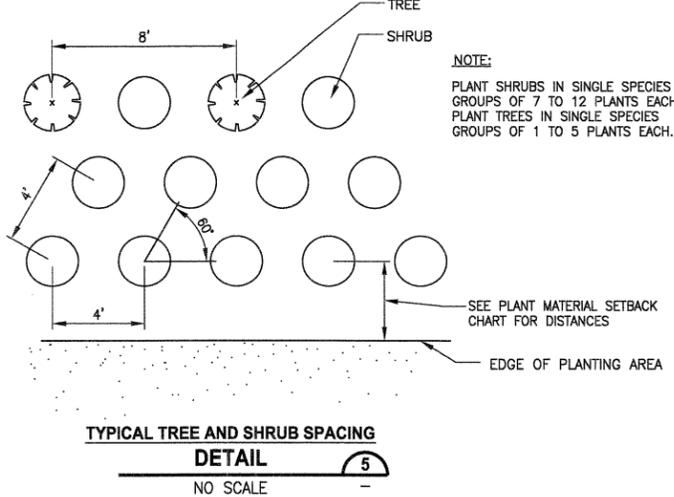
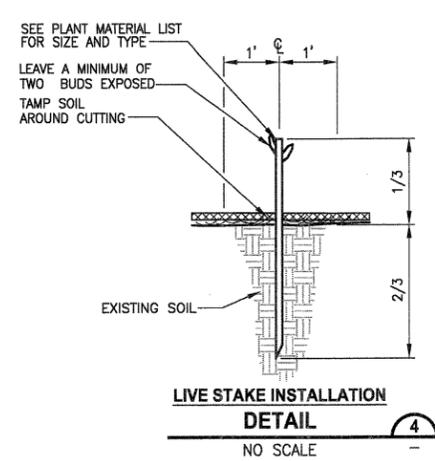
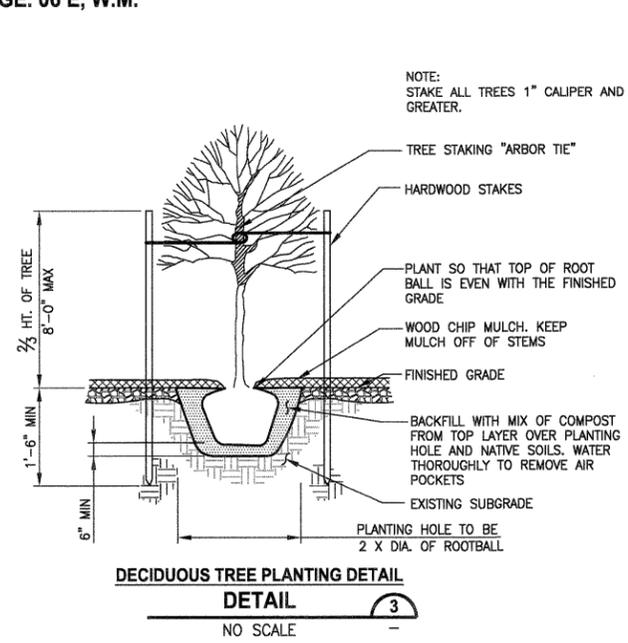
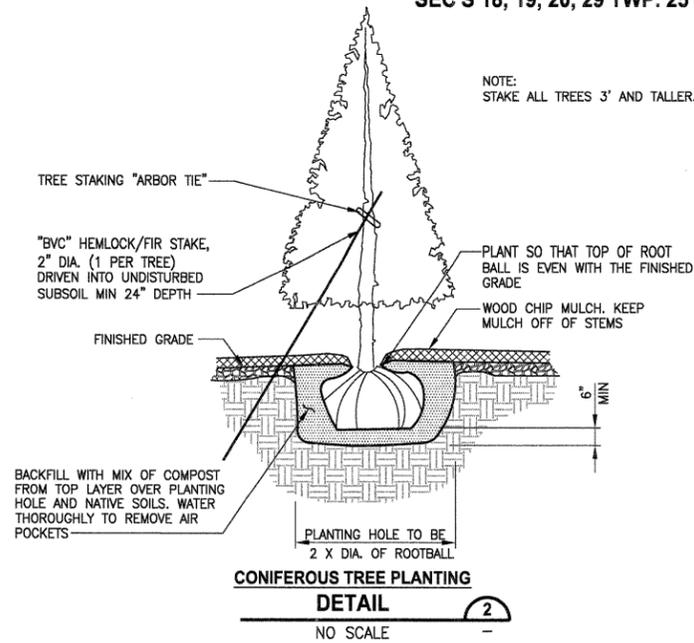
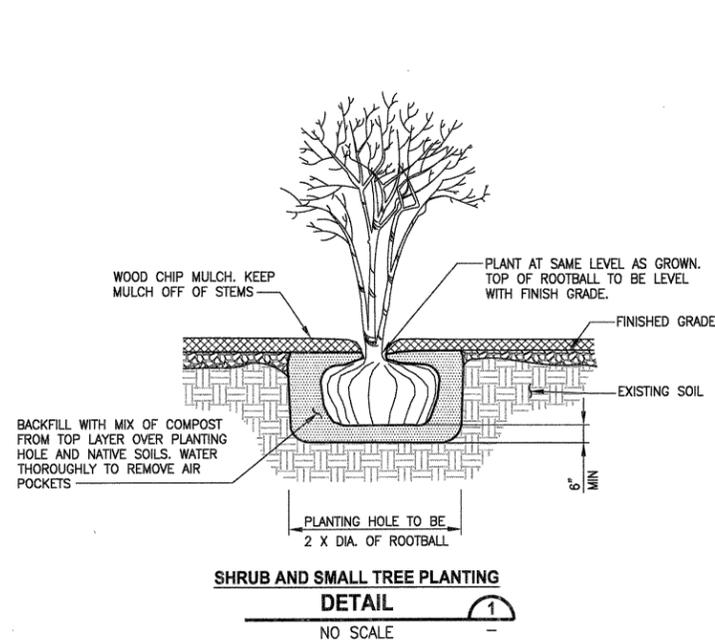
PROJECT NAME
**EAST LAKE SAMMAMISH
 MASTER PLAN TRAIL
 NORTH SAMMAMISH SEGMENT**
 SAMMAMISH, WA

**TEMPORARY IMPACT
 MITIGATION PLAN**

SHEET NO.
 122 OF 124
MP3

PLANTING NOTES:

- CONTRACTOR SHALL ARRANGE TO MEET ON SITE WITH PROJECT REPRESENTATIVE TO DISCUSS LIMITS OF WORK AND METHODS. CONSTRUCTION ACTIVITIES SHALL NOT COMMENCE UNTIL ACCESS, LIMITS OF WORK, AND METHODS ARE APPROVED.
- MITIGATION PLANTING PLANS REPRESENT A CONCEPTUAL PLANT LAYOUT. FINAL PLANT LOCATIONS SHALL BE APPROVED BY PROJECT REPRESENTATIVE PRIOR TO PLANTING.
- USE ONLY HAND TOOLS TO CLEAR AND CULTIVATE SOIL UNDER THE CANOPY (WITHIN AND 5' OUTSIDE THE DRIFLINE) OF EXISTING TREES.
- ALL PLANTS SHALL BE NURSERY GROWN A MINIMUM OF ONE YEAR. PLANT MATERIAL IS TO BE SUPPLIED BY COMMERCIAL NURSERIES THAT SPECIALIZE IN PLANTS NATIVE TO THE PACIFIC NORTHWEST. PLANT SUBSTITUTIONS ARE SUBJECT TO APPROVAL BY PROJECT REPRESENTATIVE.
- MITIGATION PLANTING SHALL TAKE PLACE DURING THE DORMANT SEASON (OCTOBER 1ST TO MARCH 1ST). PLANTING MAY BE ALLOWED AT OTHER TIMES AFTER REVIEW AND WRITTEN APPROVAL BY PROJECT REPRESENTATIVE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF ALL DEBRIS AND EXCESS SOIL OCCASIONED BY THIS PROJECT.
- CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO EXCAVATION.
- CONTRACTOR SHALL SETBACK PLANTINGS FROM OTHER OBJECTS AS PROVIDED IN THE PLANT MATERIAL SETBACK CHART THIS SHEET.
- ALL DIMENSIONS FOR LISTED HEIGHT, LENGTH AND CONTAINER SIZE ARE MINIMUM REQUIREMENTS.
- EXISTING AREAS DISTURBED BY CONSTRUCTION ACTIVITIES AND NOT SHOWN TO BE RE-VEGETATED ON THESE PLANS SHALL BE RESTORED AND SEEDED.
- DISCREPANCIES BETWEEN THE PLANS AND SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE PROJECT REPRESENTATIVE PRIOR TO PROCEEDING WITH EFFECTED WORK.
- SEE THE SHEETS FOR TEMPORARY EROSION CONTROL MEASURES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR WATERING PLANTS FOR THE FIRST YEAR AFTER ACCEPTANCE OF COMPLETION OF PLANTING FOR THE PROJECT. COUNTY WILL MAKE PROVISIONS FOR WATERING AS NEEDED FOR THE REMAINDER OF THE ESTABLISHMENT PERIOD AFTER THE FIRST YEAR.



- STEP 1**
TILL, DISC OR RIP SOIL IN PLANTING AREAS TO 10" DEPTH. PLACE 3" OF SOIL AMENDMENT OVER SOIL SURFACE.
- STEP 2**
TILL SOIL AMENDMENT INTO TOP 10" OF ENTIRE PLANTING ZONES NATIVE SOIL AFTER CLEARING AND GRUBBING.
- STEP 3**
INSTALL 1" FINE COMPOST OVER PLANTING AREA.
- STEP 4**
INSTALL PLANTS FOLLOWED BY 3" WOOD CHIP MULCH.

PLANT MATERIAL LIST

QUANTITY	BOTANICAL NAME	COMMON NAME	MIN SIZE / CONDITION	NOTES / SPACING
TREES				
238	ACER MACROPHYLLUM	BIG LEAF MAPLE	1" CALIPER	WITHIN PLANTING AREAS, LOCATE PROPOSED TREES IN GAPS TO INFILL BETWEEN EXISTING TREES. STAKE LOCATIONS FOR APPROVAL OF PROJECT REPRESENTATIVE BEFORE PLANTING.
81	AMELANCHIER ALNIFOLIA	WESTERN SERVICEBERRY	1" CALIPER	
82	CORNUS NUTTALLII	PACIFIC DOGWOOD	1" CALIPER	
77	PRUNUS EMARGINATA	BITTER CHERRY	1" CALIPER	
173	PSUEDOTSUGA MENZIESII	DOUGLAS FIR	3' HEIGHT	
27	SALIX SCOULERIANA	SCOULEERS WILLOW	1" CALIPER	
6	SALIX SITCHENSIS	SITKA WILLOW	1/2" x 3' LIVE STAKE	
10	THUJA PLICATA	WESTERN RED CEDAR	3' HT	
156	TSUGA HETEROPHYLLA	WESTERN HEMLOCK	3' HT	
SHRUBS				
238	ACER CIRCINATUM	VINE MAPLE	12" HT / #1 CONT	WITHIN PLANTING AREAS, LOCATE PROPOSED SHRUBS IN INFILL SPACES BETWEEN REMAINING EXISTING VEGETATION MASSES. STAKE LOCATIONS FOR APPROVAL OF PROJECT REPRESENTATIVE BEFORE PLANTING.
52	ACER CIRCINATUM	VINE MAPLE	24" HT / #2 CONT	
17	CORNUS SERICEA	CORNUS SERICEA	12" HT / #1 CONT	
323	CORYLUS CORNUTA	WESTERN HAZEL	12" HT / #1 CONT	
23	CORYLUS CORNUTA	WESTERN HAZEL	24" HT / #2 CONT	
243	HOLIDISCUS DISCOLOR	OCEAN SPRAY	12" HT / #1 CONT	
28	MYRICA CALIFORNICA	PACIFIC WAX MYRTLE	24" HT / #2 CONT	
237	OEMLARIA CERASIFORMIS	INDIAN PLUM	12" HT / #1 CONT	
30	OEMLARIA CERASIFORMIS	INDIAN PLUM	24" HT / #2 CONT	
531	ROSA NUTKANA	NOOTKA ROSE	12" HT / #1 CONT	
492	SYMPHORICARPOS	SNOWBERRY	12" HT / #1 CONT	
LOW SHRUBS				
1,337	GAULTHERIA SHALLON	SALAL	12" HT / #1 CONT	SPACE 2.5' O.C.
1,322	MAHONIA REPANS	CREEPING MAHONIA	12" HT / #1 CONT	SPACE 2.5' O.C.
623	POLYSTICHUM MUTINUM	SWORD FERN	12" HT / #1 CONT	SPACE 2.5' O.C.
GROUND COVER				
376	FRAGARIA CHILOENSIS	SAND STRAWBERRY	4" POT	SPACE 1' O.C.

PLANT MATERIAL SETBACK CHART

	GUARDRAIL BARRIER	EDGE OF ROADWAY	PATHS, TRAILS	WALL	FENCE	SIGNS	EXISTING TREE, TRUNK	EXISTING VEGETATION MASS
EVERGREEN TREE	15'	15'	10'	8'	8'	15'	10'	-
ORNAMENTAL/NATIVE DECIDUOUS TREE	6'	6'	10'	8'	8'	15'	10'	-
MEDIUM AND LARGE SHRUBS - GREATER THAN 3' TALL	5'	5'	5'	3'	3'	6'	5'	5'
SMALL SHRUB - LESS THAN 3' TALL	3'	5'	5'	2'	3'	2'	5'	5'

TYPICAL MINIMUM DISTANCE SETBACKS ARE TO THE CENTER STEM OR TRUNK OF PLANT MATERIAL UNLESS OTHERWISE DIRECTED BY THE ENGINEER DURING LAYOUT AND STAKING OF PLANT LOCATIONS.

KING COUNTY DPER APPROVAL

Review Engineer	Date
Senior Engineer	Date
Molly A. Johnson, P.E. DEVELOPMENT ENGINEER	Date

LAYOUT: MP4
 PATH: U:\Ball\Projects\Clients\1521-King Cnty\554-1521-075-ELST\985Vea\CADD\Phase 15\Task 03\Drawg
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REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			B. PURGANAN
			J. SWENSON
			J. SWENSON

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PROJECT NAME
EAST LAKE SAMMAMISH MASTER PLAN TRAIL NORTH SAMMAMISH SEGMENT
 SAMMAMISH, WA

MITIGATION PLANTING DETAILS

SHEET NO.
 123 OF 124
MP4

1 MITIGATION GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS

THE OVERALL GOAL OF THE MITIGATION IS TO REPLACE THE HABITATS AND FUNCTIONS LOST AS A RESULT OF THE PROJECT. THE PROPOSED MITIGATION WOULD ACCOMPLISH THIS BY REPLACING A FISH BARRIER CULVERT ON A TYPE F STREAM WITH A WIDER AND SHORTER PIPE THAT IS FISH PASSABLE. INCREASING THE BUFFER OF A LAKE FRINGE WETLAND BY 0.50 ACRE, ENHANCING 0.05 ACRE OF WETLAND BUFFER, ENHANCING 0.49 ACRE OF STREAM BUFFER, AND ENHANCING 0.03 ACRE OF SHORELINE SETBACK. SPECIFIC GOALS AND OBJECTIVES FORMULATED TO ACHIEVE THIS RESULT ARE PRESENTED BELOW.

1.1 MITIGATION GOALS

THE MITIGATION GOALS ARE:

- REPLACE A FISH BARRIER CULVERT AND REMOVE TWO FISH BARRIER BOULDERS ON A TYPE F STREAM WITH A FISH PASSABLE CULVERT.
- INCREASE AND ENHANCE THE BUFFER OF A LAKE FRINGE WETLAND BY 0.50 ACRE.
- ENHANCE 0.05 ACRE OF WETLAND BUFFER.
- ENHANCE 0.49 ACRE OF STREAM BUFFER.
- ENHANCE 0.03 ACRE OF SHORELINE SETBACK.

ACHIEVEMENT OF THESE GOALS IS EXPECTED TO PROVIDE THE FOLLOWING IMPROVEMENTS TO STREAM, WETLAND BUFFER, STREAM BUFFER, AND SHORELINE SETBACK FUNCTIONS:

- PROVIDE ADDITIONAL FISH HABITAT BY REMOVING FISH BARRIERS, INCREASING OPEN STREAM CHANNEL, AND OPENING UP AVAILABLE UPSTREAM HABITAT.
- INCREASE THE PRODUCTION OF ORGANIC MATTER BY PLANTING TREES AND SHRUBS IN THE INCREASED WETLAND BUFFER, ENHANCED WETLAND BUFFER, ENHANCED STREAM BUFFER, AND ENHANCED SHORELINE SETBACK.
- INCREASE FISH AND WILDLIFE HABITAT AND IMPROVE BIOLOGICAL DIVERSITY BY PLANTING WITH A VARIETY OF NATIVE WETLAND AND BUFFER PLANT SPECIES AND INSTALLING HABITAT FEATURES (HABITAT LOGS AND BRUSH PILES).

1.2 MITIGATION OBJECTIVES AND PERFORMANCE STANDARDS

INSTREAM HABITAT

OBJECTIVE 1: REPLACE EXISTING PERCHED CULVERT ON STREAM 0143D WITH FISH PASSAGE CULVERT AND REMOVE TWO FISH BARRIER BOULDERS TO OPEN UP AVAILABLE UPSTREAM HABITAT.

PERFORMANCE STANDARDS:

YEAR 1 AND 2 CONSTRUCTED HABITAT ELEMENTS INCLUDING THE NEW FISH PASSABLE CULVERT, REGRADED CHANNEL, AND STREAMBED MATERIAL WILL REMAIN IN PLACE AS CONSTRUCTED.

BUFFER PLANT COMMUNITIES

OBJECTIVE 2: ESTABLISH A MINIMUM OF 0.55 ACRE FORESTED WETLAND BUFFER, 0.49 ACRE FORESTED STREAM BUFFER, AND 0.03 ACRE FORESTED SHORELINE SETBACK AT THE INCREASED WETLAND BUFFER, ENHANCED WETLAND BUFFER, ENHANCED STREAM BUFFER, AND ENHANCED SETBACK AREAS.

PERFORMANCE STANDARDS:

YEAR 1 SURVIVAL OF PLANTED WOODY SPECIES IN ENHANCED WETLAND BUFFER, STREAM BUFFER, AND SHORELINE SETBACK AREAS WILL BE AT LEAST 80 PERCENT.

YEAR 3 NATIVE WOODY SPECIES WILL ACHIEVE A MINIMUM OF 35 PERCENT AREAL COVER IN THE ENHANCED WETLAND BUFFER, STREAM BUFFER, AND SHORELINE SETBACK AREAS.

YEAR 5 NATIVE WOODY SPECIES WILL ACHIEVE A MINIMUM OF 60 PERCENT AREAL COVER IN THE ENHANCED WETLAND BUFFER, STREAM BUFFER, AND SHORELINE SETBACK AREAS.

OBJECTIVE 3: LIMIT INVASIVE NON-NATIVE SPECIES THROUGHOUT THE MITIGATION SITE PLANTING AREAS.

PERFORMANCE STANDARD:

YEARS 1-5 HIMALAYAN BLACKBERRY, CUTLEAF BLACKBERRY, SCOTCH BROOM, ENGLISH IVY, AND REED CANARYGRASS WILL NOT EXCEED 20 PERCENT AREAL COVER IN ALL PLANTING AREAS.

YEAR 3 100 PERCENT REMOVAL OF JAPANESE KNOTWEED BY YEAR 3 IN THE STREAM 0143D VICINITY MITIGATION AREA.

OBJECTIVE 4: DOCUMENT SITE DEVELOPMENT.

PERFORMANCE STANDARD:

PERMANENT PHOTOGRAPHIC STATIONS WILL BE ESTABLISHED TO MONITOR THE DEVELOPMENT OF THE SITES. PHOTOGRAPHS WILL BE TAKEN ALONG TRANSECT LINES AND FROM VANTAGE POINTS THAT CAPTURE THE GENERAL MITIGATION AREA. ALL PHOTOGRAPHS WILL BE LABELED TO IDENTIFY LOCATIONS.

WILDLIFE HABITAT

OBJECTIVE 5: PROVIDE UPLAND WILDLIFE HABITAT.

PERFORMANCE STANDARD:

YEARS 1, 3, 5 INCREASE IN AREAL COVER OF NATIVE WOODY SPECIES IN THE PLANTED WETLAND BUFFER, STREAM BUFFER, AND SHORELINE SETBACK, AS MEASURED IN OBJECTIVES 2 AND 3, TO BE USED AS A SURROGATE TO INDICATE INCREASING HABITAT FUNCTIONS.

YEAR 5 INSTALLED HABITAT FEATURES ARE PRESENT AND FUNCTIONAL.

ANTHROPOGENIC DISTURBANCE

OBJECTIVE 6: PROTECT THE MITIGATION SITES FROM ANTHROPOGENIC DISTURBANCE.

PERFORMANCE STANDARD:

YEARS 1-5 CONDUCT QUALITATIVE MONITORING TO ASSESS THE STATUS OF THE SITES ANNUALLY DURING THE 5-YEAR MONITORING PERIOD TO MONITOR FOR HUMAN DISTURBANCE, INCLUDING BUT NOT LIMITED TO FILLING, TRASH, AND VANDALISM.

YEARS 1-5 INSTALL AND MAINTAIN FENCES AND APPROPRIATE SIGNS ALONG THE TRAIL AND ADJACENT TO EACH SITE TO IDENTIFY THEIR PROTECTED STATUS.

2 MONITORING AND MAINTENANCE

2.1 MONITORING

THE MITIGATION AREAS WILL BE MONITORED DURING AND AFTER CONSTRUCTION. DURING CONSTRUCTION, MONITORING WILL ENSURE THAT THE BMPS ARE OBSERVED TO MINIMIZE IMPACTS, AND THE ON-SITE CONSTRUCTION WORK (INCLUDING GRADING AND PLANTING) WILL BE COORDINATED TO ENSURE THAT THE SITES ARE CONSTRUCTED AS DESIGNED.

AFTER CONSTRUCTION IS COMPLETED, MONITORING WILL BE PERFORMED ANNUALLY TO ENSURE THAT THE GOALS AND OBJECTIVES OF THE MITIGATION ARE BEING MET. MONITORING OF THE MITIGATION AREAS WILL BE PERFORMED OVER A 5-YEAR PERIOD BY A QUALIFIED PROFESSIONAL (SAMMAMISH MUNICIPAL CODE 21A.50.145; 21A.50.300). A COMBINATION OF QUANTITATIVE AND QUALITATIVE MONITORING METHODS WILL BE USED TO ASSESS THE MANAGEMENT OBJECTIVES AND ASSOCIATED PERFORMANCE STANDARDS DESCRIBED IN THE MITIGATION PLAN. ACTIVITIES WILL INCLUDE SITE VISITS TO MONITOR UNNATURAL SITE DISTURBANCE, PHOTOGRAPHS TO DOCUMENT SITE DEVELOPMENT, AND DATA COLLECTION FOR THE QUANTITATIVE EVALUATION OF PERFORMANCE STANDARDS. THE RESULTS OF THE MONITORING WILL BE SUBMITTED TO THE PERMITTING AGENCIES.

APPROPRIATE CONTINGENCY MEASURES WILL BE DEVELOPED, AS NEEDED, BY A QUALIFIED PROFESSIONAL TO ENSURE THAT THE SITES DEVELOP HEALTHY VEGETATION THAT MEETS THE OBLIGATIONS DESCRIBED IN THIS MITIGATION PLAN AND THE ASSOCIATED PERMITS.

2.1.1 QUANTITATIVE MONITORING

THE FOLLOWING BULLETED ITEMS DESCRIBE THE METHODS TO BE USED FOR THE QUANTITATIVE MONITORING, MONITORING SCHEDULE, AND REPORT DEADLINES.

- THE ENHANCEMENT SITES WILL BE ASSESSED BY AN APPROPRIATE QUANTITATIVE VEGETATIVE COVER FIELD ASSESSMENT METHODOLOGY. THE LINE INTERCEPT METHOD WILL BE USED FOR DETERMINING PERCENT AREAL COVER FOR WOODY AND INVASIVE SPECIES.
- QUANTITATIVE VEGETATION ASSESSMENTS WILL FOLLOW THE SAME METHOD IN EACH CONSECUTIVE MONITORING YEAR.
- QUANTITATIVE VEGETATION ASSESSMENTS WILL BE PERFORMED BETWEEN JUNE 15 AND SEPTEMBER 15 OF EACH MONITORING YEAR.
- MONITORING REPORTS WILL BE SENT TO AGENCIES REQUIRING MONITORING REPORTS BY FEBRUARY 15 OF THE FOLLOWING YEAR.
- QUANTITATIVE MONITORING WILL INCLUDE PHOTOGRAPHIC DOCUMENTATION OF THE SITES FROM PERMANENT PHOTOGRAPH STATIONS.

2.1.2 QUALITATIVE MONITORING

QUALITATIVE MONITORING WILL BE CONDUCTED AS FOLLOWS:

- A QUALIFIED PROFESSIONAL WILL QUALITATIVELY ASSESS THE CONSTRUCTED HABITAT ELEMENTS INCLUDING THE NEW FISH PASSABLE CULVERT, REGRADED CHANNEL, AND STREAMBED MATERIAL FOR THE FIRST 2 YEARS.
- QUALITATIVE ASSESSMENT WILL BE PERFORMED YEARLY TO VISUALLY ASSESS THE HEALTH OF PLANTS AND IDENTIFY AREAS THAT MAY NEED CONTROL OF NON-NATIVE INVASIVE SPECIES OR OTHER MAINTENANCE ACTIVITIES.

2.2 MAINTENANCE

THE PROPOSED MITIGATION IS INTENDED TO ACHIEVE THE PERFORMANCE STANDARDS WITH MINIMAL ONGOING MAINTENANCE. HOWEVER, KING COUNTY WILL MANAGE AND MAINTAIN THE SITE FOR 5 YEARS, OR UNTIL ALL PERFORMANCE STANDARDS ARE MET AND THE SITE IS CLOSED WITH THE APPROVAL OF PERMITTING AGENCIES.

PLANTED VEGETATION SPECIES SHOULD BE ADAPTED TO VARYING SITE CONDITIONS IN THE PUGET SOUND LOWLAND, THOUGH SUPPLEMENTAL IRRIGATION MAY BE NEEDED DURING THE FIRST TWO GROWING SEASONS AFTER INSTALLATION TO ENSURE THE LONG-TERM SURVIVAL OF THE PLANTS. THE NEED FOR IRRIGATION WILL BE EVALUATED BASED ON THE CONDITIONS OBSERVED DURING THE ESTABLISHMENT PERIOD.

TO ENSURE RAPID ESTABLISHMENT OF THE PLANT COMMUNITY, TREES AND SHRUBS WILL BE PLANTED CLOSER TOGETHER THAN WOULD GENERALLY OCCUR IN NATURAL MATURE STANDS. SOME NATURAL MORTALITY IS EXPECTED TO OCCUR DURING THE MONITORING PERIOD. ALL DEAD AND DOWNED WOODY MATERIAL WILL BE LEFT IN PLACE TO PROVIDE MICROHABITATS FOR WILDLIFE. PLANTS WILL BE REPLACED AS NEEDED TO MEET PERFORMANCE STANDARDS.

MAINTENANCE TO CONTROL NUISANCE SPECIES IN THE MITIGATION AREAS MAY BE NECESSARY. DURING THE MONITORING PERIOD, IF IT BECOMES EVIDENT THAT INVASIVE SPECIES ARE IMPEDING ESTABLISHMENT OF DESIRABLE NATIVE PLANTS, MEASURES WILL BE IMPLEMENTED TO CONTROL NUISANCE SPECIES. A PROGRESSIVELY AGGRESSIVE APPROACH WILL BE USED TO CONTROL NUISANCE SPECIES. CONTROL MEASURES WILL FIRST INCLUDE HAND CUTTING AND/OR GRUBBING AND REMOVAL; IF THIS FAILS, AN ENVIRONMENTALLY SENSITIVE HERBICIDE (E.G., RODEO OR EQUIVALENT) MAY BE APPLIED.

2.3 CONTINGENCY MEASURES

IF MONITORING INDICATES THAT THE SITES ARE NOT MEETING PERFORMANCE STANDARDS, CONTINGENCY MEASURES WILL BE IMPLEMENTED (TABLE 2-1). SITE CONDITIONS WILL BE EVALUATED TO DETERMINE THE CAUSE OF THE PROBLEM AND THE MOST APPROPRIATE COUNTERMEASURE.

TABLE 2-1. CONTINGENCY MEASURES FOR THE MITIGATION SITE

PROBLEM	CONTINGENCY MEASURE
LESS THAN 80% OF PLANTED WOODY SPECIES SURVIVE IN YEAR 1	KING COUNTY BIOLOGISTS (OR OTHER QUALIFIED BIOLOGIST) WILL ASSESS THE SITES TO DETERMINE WHAT CONDITIONS ARE PREVENTING THE PLANTS FROM THRIVING. APPROPRIATE MEASURES WILL BE TAKEN TO CORRECT ANY CONDITIONS THAT ARE LIMITING GROWTH. LOST PLANTS WILL BE REPLACED WITH APPROPRIATE NATIVE SPECIES UNLESS APPROPRIATE NATIVE WOODY SPECIES ARE VOLUNTEERING AT A RATE SUFFICIENT TO REPLACE THEM. ADDITIONAL MEASURES (SUCH AS PROVIDING ADDITIONAL PROTECTION) WILL BE CONSIDERED IF NECESSARY.
PERCENT COVER FOR WOODY SPECIES NOT MET DURING YEARS 3 OR 5	KING COUNTY BIOLOGISTS (OR OTHER QUALIFIED BIOLOGIST) WILL ASSESS THE SITES TO DETERMINE WHAT CONDITIONS ARE PREVENTING THE PLANTS FROM THRIVING. APPROPRIATE MEASURES WILL BE TAKEN TO CORRECT ANY CONDITIONS THAT ARE LIMITING GROWTH.
INVASIVE SPECIES EXCEED PERCENT COVER THRESHOLD	IMPLEMENT/REVISE INVASIVE SPECIES CONTROL PLAN.
PERFORMANCE STANDARDS NOT MET AT YEAR 5	CONTINUE THE MONITORING REGIME FOR 1 ADDITIONAL YEAR. THE SITES WILL CONTINUE TO BE EVALUATED EVERY YEAR UNTIL IT HAS MET THE STATED PERFORMANCE STANDARDS ASSOCIATED WITH MANAGEMENT OBJECTIVES. OTHER CONTINGENCY MEASURES MAY BE IMPLEMENTED DURING THIS PERIOD.

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR THE FIRST YEAR PLANT ESTABLISHMENT AND OTHER ASSOCIATED MAINTENANCE PER WSDOT SPECIFICATIONS. AFTER THE FIRST YEAR THE COUNTY WILL MAKE PROVISIONS TO MAINTAIN THE MITIGATION SITES. THE COUNTY WILL PERFORM THE ANNUAL MONITORING PROGRAM DESCRIBED ON THIS PLAN SHEET TO ASSESS ACHIEVEMENT OF PERFORMANCE STANDARDS.

LAYOUT: MP5 PATH: U:\Ball\Projects\Clients\1521-King Cnty\354-1521-075-ELST\985ves\CADD\Phase 15\Task 03\DWG PLOTTED BY: airesate DATE: Tuesday, March 05, 2013 11:36:54 AM

REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			B. PURGANAN
			J. SWENSON
			APPROVED

ONE INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY.

FILE NAME: B11521075P15T03MP-01

DES No. 554-1521-075-P15T04B

DATE: MARCH 2013



STATE OF WASHINGTON LICENSED LANDSCAPE ARCHITECT

J. SWENSON

LICENSE NO. 896

EXPIRES ON 10/31/13

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PROJECT NAME

EAST LAKE SAMMAMISH MASTER PLAN TRAIL NORTH SAMMAMISH SEGMENT

SAMMAMISH, WA

MITIGATION NOTES

SHEET NO. 124 OF 124

MP5

KING COUNTY DPER APPROVAL	
Review Engineer _____	Date _____
Senior Engineer _____	Date _____
Molly A. Johnson, P.E. DEVELOPMENT ENGINEER	Date _____

