

# East Lake Sammamish Master Plan Trail, South Sammamish Segment A Final Critical Areas Study

Prepared for



**King County**  
Parks and Recreation Division

May 2015

Prepared by

**Parametrix**



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## ACRONYMS AND ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
BMP	best management practice
BNSF	Burlington Northern Santa Fe
CARAs	critical aquifer recharge areas
CAS	Critical Areas Study
CMP	corrugated metal pipe
Ecology	Washington State Department of Ecology
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FWHCA	fish and wildlife habitat conservation area
GIS	geographic information system
HGM	hydrogeomorphic (classification)
KCCFM	King County Department of Construction and Facilities Management
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
RCW	Revised Code of Washington
SMC	Sammamish Municipal Code
SMP	Shoreline Master Program
SWPPP	stormwater pollution prevention plan
TDA	threshold discharge area
TESC	temporary erosion and sedimentation control
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
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

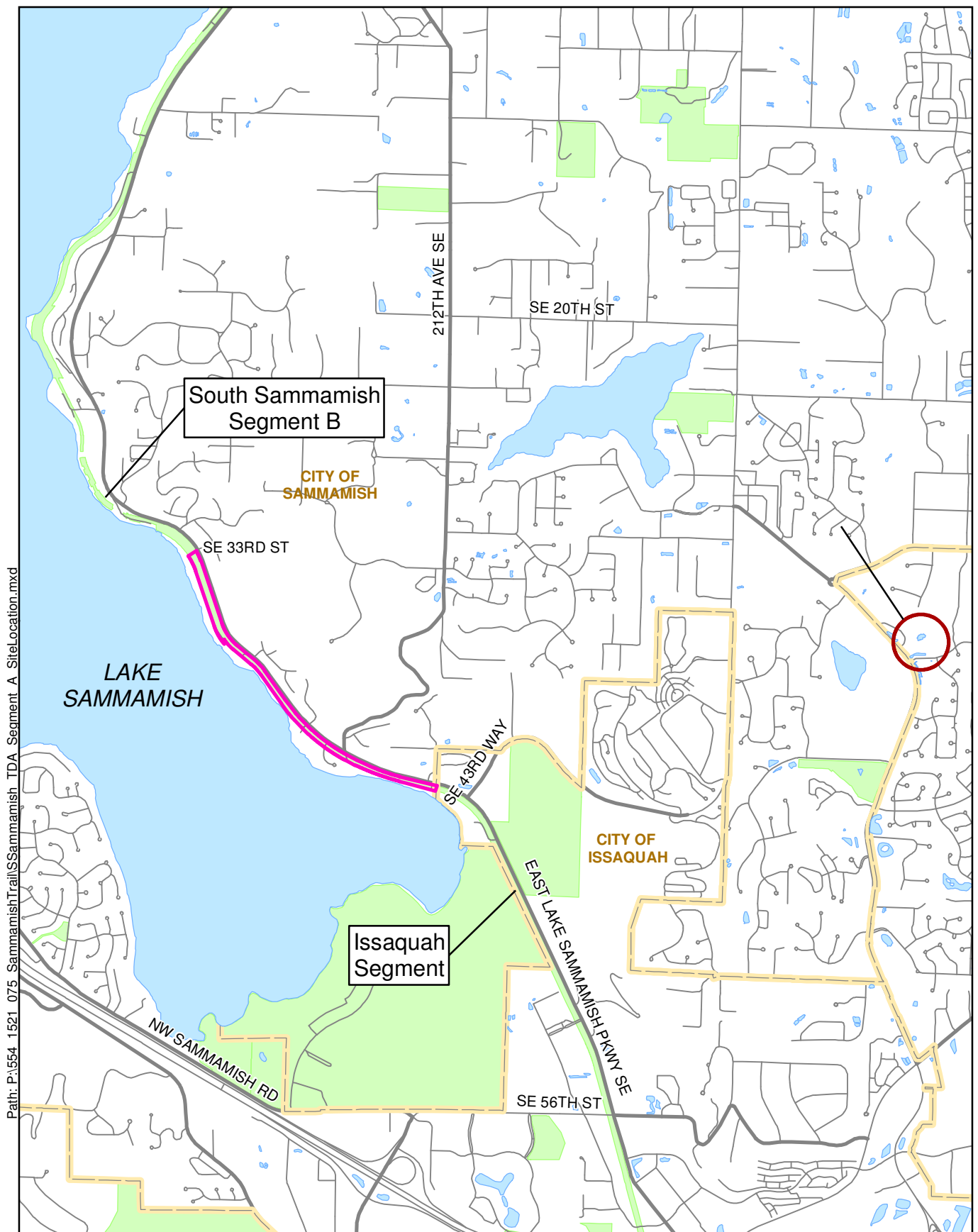
King County is proposing to develop the East Lake Sammamish Master Plan Trail (Master Plan Trail)—a 10.33-mile regional multi-user trail and nonmotorized alternative transportation corridor located near the eastern shore of Lake Sammamish. The entire project site is located along the existing Interim 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.

The proposed improvements of the Master Plan Trail have been and will be constructed in several segments—Redmond, Issaquah, North Sammamish, and South Sammamish. The Redmond Segment of the trail was constructed in 2011 and the Issaquah Segment was constructed from 2012 to 2013. The North Sammamish Segment started construction in 2014. The South Sammamish Segment will be separated into two construction phases: A and B. South Sammamish Segment A, scheduled for construction in 2015, is approximately 1.25 miles long, extending from the city's south boundary near SE 43rd Way to SE 33rd Street (Figure 1-1). Segment B, scheduled for construction in 2016, is approximately 3.5 miles long, extending from SE 33rd Street to Kokomo Drive (NE Inglewood Hill Road vicinity). South Sammamish Segment A of the proposed trail is the focus of this report.

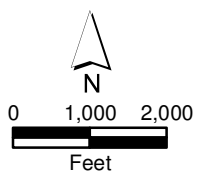
An existing gravel trail (i.e., the Interim Use Trail) is located in the project corridor. The Master Plan Trail will be the “full” buildout of the trail and will replace the existing soft-surface Interim Use Trail along a similar alignment. The Interim Use Trail is typically 8 to 12 feet wide and will 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;
- 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.



Parametrix



 Project Location

**Figure 1-1**  
**Site Location Map**  
**East Lake Sammamish Trail**  
**South Sammamish - Segment A**



The South Sammamish Segment A 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 Trail and Sammamish River Trail 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 South Sammamish Segment A 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 impacts to or alteration of an environmentally critical area is proposed or may occur as a consequence of proposed actions (Sammamish Municipal Code [SMC] 21A.50.120). King County is proposing an alignment that follows the existing Interim Use Trail, which is also the location of a former railbed. The proposed project is consistent with City trail corridor development standards (SMC 21A.30.210(1) - Use of Existing Corridors) that states trails should generally be located along existing cleared areas or on improved corridors. This is also consistent with the City's regulations regarding permitted alterations to wetlands and streams (SMC 21A.50.300(10); SMC 21A.50.340(7)) that state the use of existing crossings, including but not limited to utility corridors, road and railroad rights-of-way within wetlands, streams, or buffers for public or private trails, is preferred to new crossings, subject to the standards and requirements in the SMC. This CAS has been prepared to satisfy these City of Sammamish requirements by describing wetlands, streams, fish and wildlife habitat conservation areas (FWHCAs), and critical aquifer recharge areas (CARAs) within the project area; evaluating potential impacts on these critical areas from the proposed trail; and presenting mitigation for these impacts. 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 SE (to the east) for much of the corridor, between the city's south boundary near SE 43rd Way to the vicinity of SE 33rd Street. The right-of-way varies from 100 to 150 feet in width along the trail. South Sammamish Segment A is located in Sections 8 and 17, Township 24 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 five wetlands, five streams, and Lake Sammamish.



## 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
- U.S. Department of Agriculture, Natural Resources Conservation Service (USDA, NRCS) Web Soil Survey (USDA, NRCS 2013)
- National Wetlands Inventory (NWI), online wetlands mapper (U.S. Fish and Wildlife Service [USFWS] 2013)
- A Catalog of Washington Streams and Salmon Utilization, Volume 1, Puget Sound Region (Williams et al. 1975)
- SalmonScape online mapping tool (Washington Department of Fish and Wildlife [WDFW] 2014a)
- 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)
- 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 2014b)
- List of Sections that Contain Natural Heritage Features (Washington State Department of Natural Resources [WDNR] 2014)
- 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 to identify and delineate wetlands and streams as part of the East Lake Sammamish Master Plan Trail Final Environmental Impact Statement (King County 2010). Project biologists re-delineated wetlands and streams in November and December 2007, January, March, and April 2008, and January 2009 to identify

and document current resource conditions in the project corridor (since more than 5 years had lapsed). The King County Department of Permitting and Environmental Review (formerly Department of Development and Environmental Services) biologist reviewed the wetlands in Sammamish in the winter of 2008/2009. Wetlands and streams within the South Sammamish Segments were verified and re-evaluated in 2013 and 2014 to update any areas where changes may have occurred due to recent development or natural conditions in the project vicinity since 2008. New wetland boundaries were delineated and flagged only where there was a change in conditions. If conditions remained the same, no changes to the boundary were made. Recent field observations are documented in this report.

## 2.3 Wetland Identification

Biologists delineated wetlands in 2007/2008/2009 according to the methods specified in the U.S. Army Corps of Engineers (USACE) Wetlands Delineation Manual (Environmental Laboratory 1987). At that time, these methods complied with those in the Washington State Wetland Identification and Delineation Manual (Washington State Department of Ecology [Ecology] 1997).

Biologists re-evaluated wetlands in 2013/2014 according to the methods specified in the USACE's Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0) (USACE 2010). These methods comply with those adopted by Washington State pursuant to Washington Administrative Code (WAC) 173-22-035 and Revised Code of Washington (RCW) 90.58.380 and the City of Sammamish under SMC 21A.15.1415.

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. Wetland determination data forms were recorded for each wetland (Appendix A). Representative photographs of each wetland are provided in Appendix B.

### 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 USACE National Wetland Plant List (Lichvar et al. 2014). Table 2-1 provides the definitions of the indicator status categories. The scientific and common names for plants follow the currently accepted nomenclature. Dominant plant species were observed and recorded on wetland determination data forms for each data plot (Appendix A).

**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).

### 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 layer, 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 (GretagMacbeth 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. Primary indicators of hydrology include surface inundation and saturated soils. Secondary indicators of hydrology include drainage patterns and water-stained leaves.

## 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). Hydrogeomorphic classifications were assigned to wetlands using USACE methods established in A Hydrogeomorphic Classification for Wetlands (Brinson 1993). In accordance with SMC 21A.50.290, wetlands were rated using the revised Washington State Wetland Rating System for Western Washington (Hruby 2004) (Appendix C).

The standard buffer widths for the wetlands in the project area are those required under SMC 21A.50.290(2) (Table 2-2). However, where a legally established and constructed street or the East Lake Sammamish Trail transects a wetland buffer, the City of Sammamish may approve a modification of the standard buffer width to the edge of the street or the East Lake Sammamish Trail 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.

**Table 2-2. City of Sammamish Standard Wetland Buffer Widths**

Wetland Category		Standard Buffer Width (feet)
Category I	Natural Heritage or bog wetlands	215
	Habitat score 29 – 36	200
	Habitat score 20 – 28	150
	Not meeting above criteria	125
Category II	Habitat score 29 – 36	150
	Habitat score 20 – 28	100
	Not meeting above criteria	75
Category III	Habitat score 20 – 28	75
	Not meeting above criteria	50
Category IV		All land use types – 50
Category III and IV		Subject to SMC 21A.50.320

Source: SMC 21A.50.290(2)

## 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 D). Table 2-3 lists the wetland functions and values evaluated.

**Table 2-3. Wetland Functions and Values Assessed**

<b>FUNCTIONS</b>	
Flood Flow Alteration	Habitat for Aquatic Invertebrates
Sediment Removal	Habitat for Amphibians
Nutrient and Toxicant Removal	Habitat for Wetland-Associated Mammals
Erosion Control and Shoreline Stabilization	Habitat for Wetland-Associated Birds
Production of Organic Matter and its Export	General Fish Habitat
General Habitat Suitability	Native Plant Richness
<b>VALUES</b>	
Educational or Scientific Value	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 was identified and instrument-surveyed by professional land surveyors. Stream data were 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. These data have also assisted in determining where fish passage improvements are recommended. No fish passage improvements are proposed in South Sammamish Segment A.

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 WAC 222-16-031 and SMC 21A.15.1240. 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(1) (Table 2-4). Similar to wetland buffers, where a legally established and constructed street or the East Lake Sammamish Trail transects 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.

**Table 2-4. City of Sammamish Standard Stream Buffer Widths**

<b>Stream Type</b>	<b>Standard Buffer Width (feet)</b>
Type S	150
Type F	150
Type Np	75
Type Ns	50

Source: SMC 21A.50.330

## 2.7 Lake Sammamish

Portions of the project area are 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.

A field delineation of Lake Sammamish's OHWM was limited to where a potential drainage outfall was considered to be extended to the lake edge on a private parcel. The OHWM for Lake Sammamish was not field-delineated for the remaining areas of the project because it was outside of the trail right-of-way and would not be directly affected. Instead, King County 2010 geographic information system (GIS) data on open water were used to determine the OHWM and shoreline setback area for these areas.

## 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 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) Wetlands, streams, and lakes;
- (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) Fish and wildlife habitat corridors as defined in SMC 21A.15.469.

## 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. South Sammamish Segment A is within the Monohon subbasin (Figure 3-1). Much of this subbasin drains directly to Lake Sammamish without forming a distinct channel (KCCFM 2000). City of Sammamish critical area maps identify two streams crossing the project area. FEMA floodplains are not mapped for any of the streams in the Monohon subbasin.

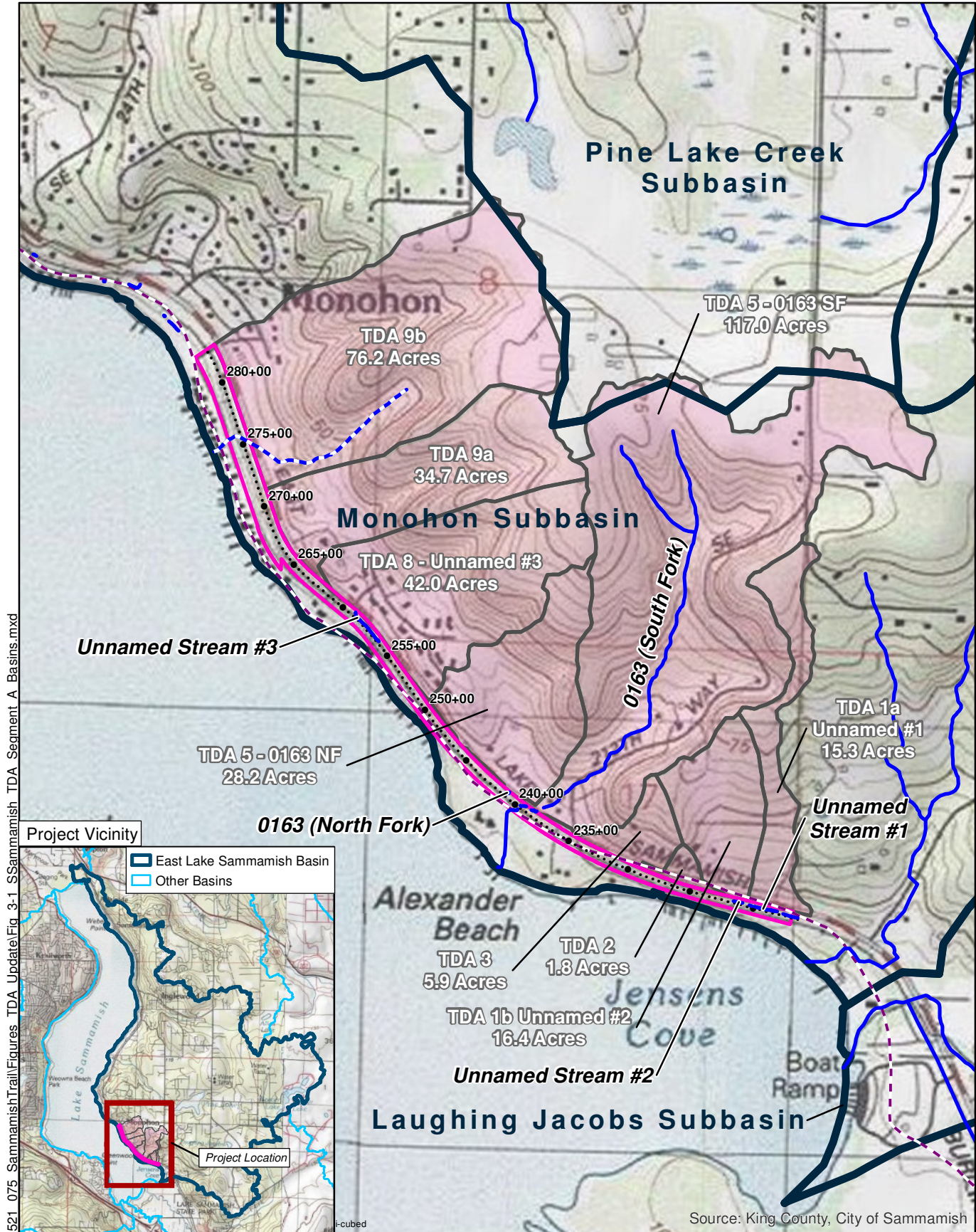
The East Lake Sammamish area is located on the eastern side of the Seattle metropolitan area and is rapidly becoming a densely urban area. The city of Sammamish was incorporated in 1999 from lands that were formerly unincorporated King County, and has increased rapidly in population growth with both 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 NRCS Web Soil Survey identifies five soil mapping units within the project area: Kitsap silt loam (2 to 8 percent slopes) and Kitsap silt loam (15 to 30 percent slopes), which are identified as predominantly non-hydric; Everett gravelly sandy loam (5 to 15 percent slopes); Everett gravelly sandy loam (15 to 30 percent slopes); and Ragnar-Indianola association, moderately steep, which are identified as non-hydric.

### 3.2 Wetlands

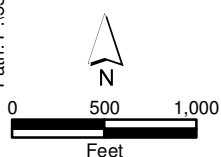
Project biologists delineated five wetlands in the project area (Figures 3-2a through 3-2c). Wetland characteristics are summarized for all wetlands (Table 3-1). A summary of wetland functions and values (Table 3-2), along with detailed descriptions for wetlands identified and delineated, are provided below.



Path: P:\554\_1521\_075\_SammamishTrail\Figures TDA Update\Fig 3-1 SSammamish TDA Segment A Basins.mxd

Source: King County, City of Sammamish

### Parametrix



- South Sammamish Segment A Project Location
- Stream Crossing Field-verified by Parametrix
- Stream Crossing Not Found within Trail Corridor
- 100-year Floodplain Boundary
- Drainage Subbasin Boundary
- Catchment Area

480+00  
485+00  
Proposed Trail Stationing

Note: Project area is within the East Lake Sammamish Basin.

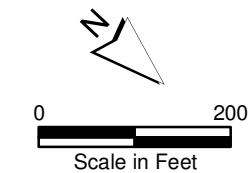
**Figure 3-1  
Drainage Basins,  
Subbasins and  
Site Characteristics**





Path: P:\554\_1521\_075\_SammamishTrail\Sammamish\_Review\_Segment\_A\_1\_200.mxd

Parametrix



- |                  |                                    |   |
|------------------|------------------------------------|---|
| — Proposed Trail | — Culvert                          | — City Limits                                     |
| — Wetland        | — Class 3 Wellhead Protection Zone | — Project Right of Way                            |
| — Wetland Buffer | ● Group B Well                     | — Stream  |
| — Stream Buffer  | — Lake OHHM                        | — Stream Crossing Not Found Within Trail Corridor |
|                  | — Shoreline Setback                |   |



**Figure 3-2a**  
**Critical Areas Map**  
**East Lake Sammamish Trail**  
**South Sammamish -**  
**Segment A**



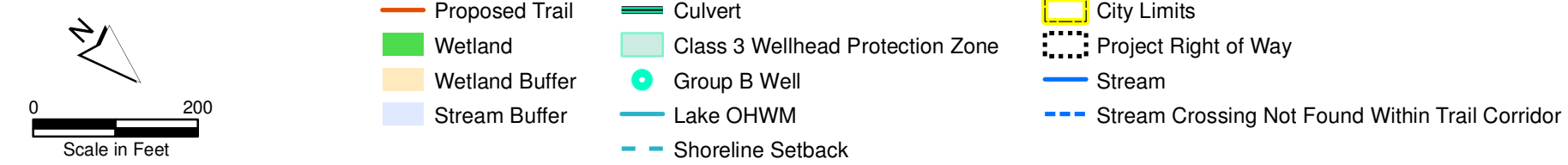






Path: P:\554 1521 075 SammamishTrail\Sammamish Review Segment A 1 200.mxd

Parametrix

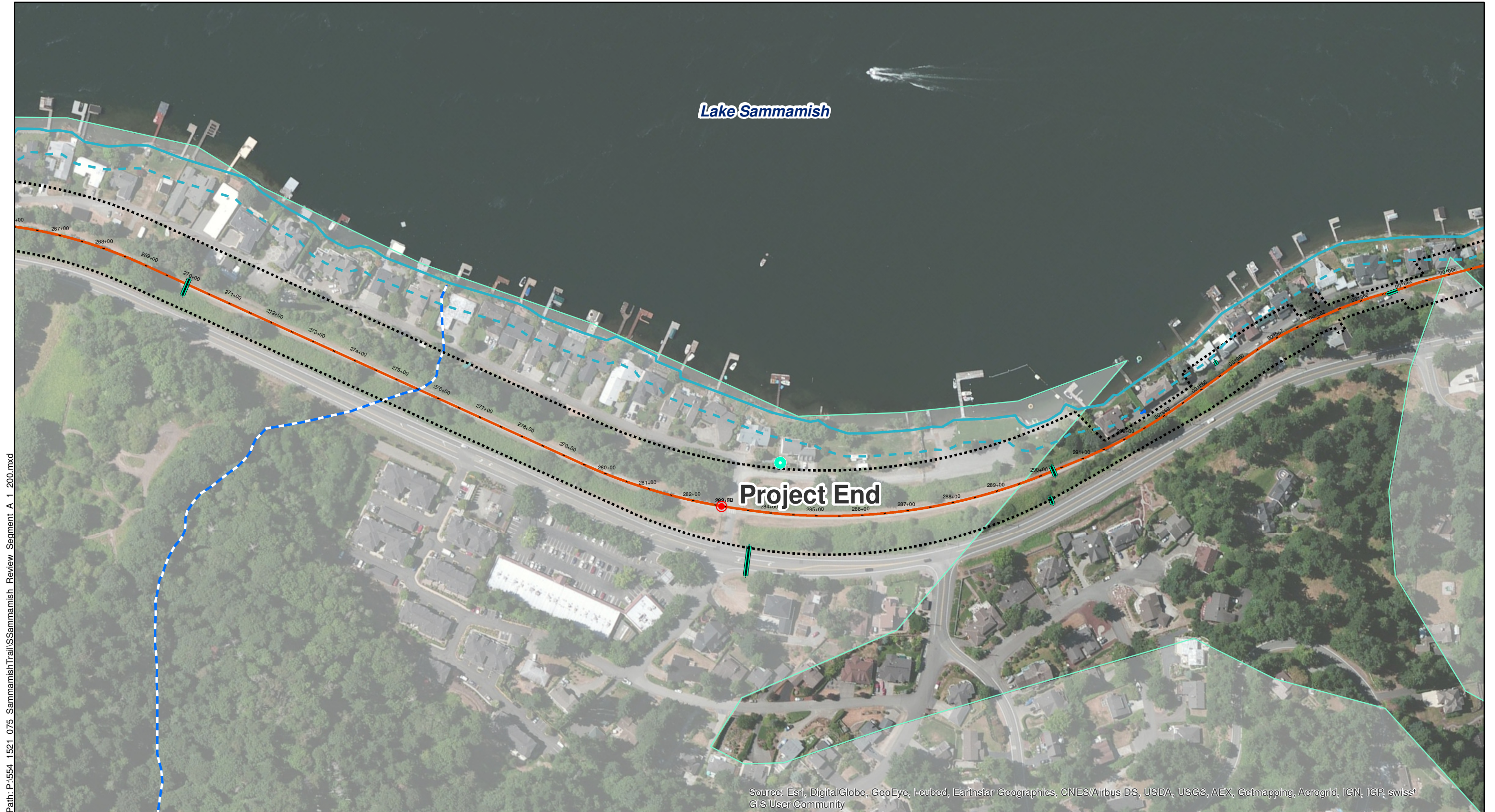


**Figure 3-2b**  
**Critical Areas Map**  
**East Lake Sammamish Trail**  
**South Sammamish -**  
**Segment A**



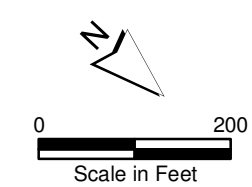




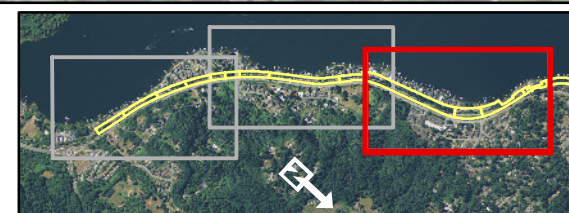


Path: P:\554 1521 075 SammamishTrail\Sammamish Review Segment A 1 200.mxd

# Parametrix



- Proposed Trail
- Wetland
- Wetland Buffer
- Stream Buffer
- Culvert
- Class 3 Wellhead Protection Zone
- Group B Well
- Lake OHWM
- Shoreline Setback
- City Limits
- Project Right of Way
- Stream
- Stream Crossing Not Found Within Trail Corridor



**Figure 3-2c**  
**Critical Areas Map**  
**East Lake Sammamish Trail**  
**South Sammamish -**  
**Segment A**





**Table 3-1. Summary of Wetlands in the Project Area**

Wetland	Size (acres)	Ecology/ Sammamish Rating <sup>a</sup>	Buffer Width <sup>b</sup> (feet)	USFWS Class <sup>c</sup>	HGM Class <sup>d</sup>
3E	0.07 <sup>e</sup>	IV	50	PEM	Depressional/Riverine
12A	0.06	III	50	PFO	Depressional
13A	0.40	III	50	PFO/PSS/PEM	Depressional/Slope
14A	0.04	IV	50	PEM	Depressional/Riverine
14C	0.05	IV	50	PEM	Depressional/Slope

<sup>a</sup> Hruby (2004), as specified in SMC 21A.50.290

<sup>b</sup> SMC 21A.50.290

<sup>c</sup> Cowardin classification (1979)

PEM = palustrine emergent

PFO = palustrine forested

PSS = palustrine scrub-shrub

<sup>d</sup> Brinson (1993); HGM = hydrogeomorphic

<sup>e</sup> 0.01 acre within the city of Sammamish

**Table 3-2. Summary of Wetland Functions and Values for Wetlands in the Project Area**

Wetland Functions and Values	Wetland (HGM Class)				
	3E (D/R)	12A (D)	13A (D/S)	14A (D/R)	14C (D/S)
Flood Flow Alteration	M	L	L	L	L
Sediment Removal	M	L	L	L	L
Nutrient and Toxicant Removal	M	L	L	L	L
Erosion Control and Shoreline Stabilization	L	-	-	L	-
Production and Export of Organic Matter	M	L	M	M	M
General Habitat Suitability	-	L	L	L	L
Habitat for Aquatic Invertebrates	M	L	L	L	L
Habitat for Amphibians	M	L	L	L	L
Habitat for Wetland-Associated Mammals	-	-	-	-	-
Habitat for Wetland-Associated Birds	-	-	-	-	-
General Fish Habitat	L	-	-	L	-
Native Plant Richness	L	-	-	-	-
Educational or Scientific Value	-	-	-	-	-
Uniqueness and Heritage	-	-	-	-	-

H = high

M = moderate

L = low

- = Does not provide this function

HGM Classes: D = Depressional, R = Riverine, S = Slope

### Wetland 3E

Subbasin: Monohon

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional/Riverine

City of Sammamish/Ecology Rating: Category IV

Data Plots: 3E-SP1, 3E-SP2

Stations: 216+50 to 217+75

Size: 0.07 acre (0.01 acre within the city of Sammamish)

---

Wetland 3E is on the east side of the trail, between the trail and East Lake Sammamish Parkway SE, associated with Many Springs Creek (Figure 3-2a). The southern portion of this wetland lies within Issaquah while the northern portion lies within Sammamish. This wetland is located entirely within the trail right-of-way, mostly within the maintained edge.

### Hydrology

Wetland hydrology is maintained by local area runoff and overbank flow from Many Springs Creek. Many Springs Creek discharges into the south end of the wetland from a culvert that passes under East Lake Sammamish Parkway. Surface water from the stream drains to the south crossing under the trail to its outlet in Lake Sammamish. Surface water also flows north via a ditch in the wetland to a pipe under a driveway, connecting to Wetland 14A. Soils were saturated to the surface with standing water during the October 2007 and September 2013 field investigation. Surface water was observed throughout the ditch and flowing water was present in Many Springs Creek. Wetland 3E has permanently inundated and saturated only water regimes.

### Vegetation

Wetland 3E has an emergent vegetation community with an overhanging tree canopy rooted outside of the wetland. Dominant vegetation in the wetland includes small-fruited bulrush (*Scirpus microcarpus*) and reed canarygrass (*Phalaris arundinacea*). Other species observed include broadleaf cattail (*Typha latifolia*), softstem bulrush (*Scirpus tabernaemontani*), watercress (*Nasturtium officinale*), ladyfern (*Athyrium filix-femina*), giant horsetail (*Equisetum telmateia*), ovate spikerush (*Eleocharis ovata*), American vetch (*Vicia americana*), fowl mannagrass (*Glyceria striata*), bluegrass (*Poa* spp.), and a few black cottonwood (*Populus balsamifera*) saplings. Common duckweed (*Lemna minor*) was present in deeper stagnant water.

### Soils

Soil was examined in Wetland 3E to a depth of 16 inches and consists of three layers. The surface layer is a 5-inch layer of black (10YR 2/1) mucky loam. The lower layers are a 5-inch layer of dark gray (2.5Y 4/1) loamy sand over a 6-inch layer of very dark gray (2.5Y 3/1) mucky loam. Soil in the area is mapped as Everett gravelly sandy loam.

### Buffer

Residential development and the trail are located west of the wetland, and the East Lake Sammamish Parkway SE lies to the east. The buffer between the wetland and the parkway is mostly dominated by Himalayan blackberry (*Rubus armeniacus*) and reed canarygrass. Other vegetation includes a swathe of black cottonwood, red alder (*Alnus rubra*), bigleaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), Pacific willow (*Salix lucida*), bitter cherry (*Prunus emarginata*), common snowberry (*Symphoricarpos albus*), beaked hazelnut (*Corylus cornuta*), western swordfern (*Polystichum munitum*), bracken fern (*Pteridium aquilinum*), and giant horsetail (*Equisetum telmateia*). The buffer between the

trail and the wetland is primarily a narrow strip of maintained herbaceous vegetation. Trees and landscaped shrubs are present on the west side of the trail.

#### *Wetland Classification*

Wetland 3E is classified as a palustrine emergent wetland under the Cowardin (1979) system and a depressional/riverine system under the HGM system (Null et al. 2000; Hruby 2004). Wetland 3E is rated a Category IV according to the City of Issaquah, the City of Sammamish, and Ecology. This wetland scored 19 points on the rating form of the Washington State Wetland Rating System for Western Washington (4 points for water quality functions, 4 points for hydrologic functions, and 11 points for habitat functions) (see 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 3E 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 12A*

Subbasin: Monohon

USFWS Classification: Palustrine Forested

HGM Classification: Depressional

City of Sammamish/Ecology Rating: Category III

Data Plots: 12A-SP1, 12A-SP2

Stations: 242+00 to 243+75

Size: 0.06 acre

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Wetland 12A is located on the east side of the trail southeast of the intersection of East Lake Sammamish Parkway SE and 205th Avenue SE (Figure 3-2b). This wetland is located entirely within the project area.

#### *Hydrology*

Wetland hydrology is maintained by seasonally high groundwater and local area runoff. Inundation to a depth of 8 inches was observed during the October 2007 wetland delineation. No inundation or saturated soils were observed in September 2013. Wetland 12A is a closed depressional system; therefore, there are no outlets. This wetland has seasonally flooded and saturated only water regimes.

#### *Vegetation*

Wetland 12A is a forested wetland community dominated by red alder and Pacific willow. The understory is vegetated with red-osier dogwood (*Cornus sericea*), Himalayan blackberry, reed canarygrass, creeping buttercup (*Ranunculus repens*), hedge false bindweed (*Calystegia sepium*), and common ladyfern.

#### *Soils*

Soil in Wetland 12A was examined to a depth of 18 inches and consists of two layers. The upper layer is a 13-inch layer of very dark gray (10YR 3/1) silt loam. The lower layer is a 5-inch layer of dark grayish brown (2.5Y 4/2) sandy loam with yellowish red (5YR 5/8) redoximorphic features. Soil in the area is mapped as Everett gravelly sandy loam.

## Buffer

The buffer around Wetland 12A is limited by the trail on the west and East Lake Sammamish Parkway SE on the east. Residential driveways exist to the north and south of the wetland. The buffer between the trail and the wetland consists primarily of maintained herbaceous vegetation. The rest of the buffer is dominated by red alder and Himalayan blackberry.

## Wetland Classification

Wetland 12A is classified as a palustrine forested wetland under the Cowardin (1979) system and a depressional system under the HGM system (Null et al. 2000; Hruby 2004). Wetland 12A is rated a Category III according to the City of Sammamish and Ecology. This wetland scored 47 points on the rating form of the Washington State Wetland Rating System for Western Washington (12 points for water quality functions, 24 points for hydrologic functions, and 11 points for habitat functions) (see 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 12A 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 13A*

Subbasin: Monohon

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

HGM Classification: Depressional/Slope

City of Sammamish/Ecology Rating: Category III

Data Plots: 13A-SP1, 13A-SP2, 13A-SP3

Stations: 224+75 to 234+50

Size: 0.40 acre

---

Wetland 13A is a linear wetland located between the trail and East Lake Sammamish Parkway SE, south of the intersection with East Lake Sammamish Shore Lane SE/212th Way SE (Figure 3-2a). The northern quarter of the wetland is formed in a topographical depression along the base of East Lake Sammamish Parkway SE. The majority of the wetland occurs on the steep hillslope leading up to East Lake Sammamish Parkway SE, with active seeps that discharge to a ditch along the trail. This wetland is located entirely within the project area in the maintained portion of the trail corridor.

### *Hydrology*

Wetland hydrology is supported by groundwater seeps on the slope and local area runoff. A pipe under East Lake Sammamish Parkway SE to the east and a pipe under the driveway to the west discharge stormwater runoff into the wetland. A ditch running along the toe of the trail prism drains the wetland. Water generally flows south out of the wetland to a ditch (Ditch 9), then through a culvert at the south end that passes under the trail. Water also exits the wetland from a pipe in the vicinity of Station 229+85. Standing water (up to 9 inches) in the ditch and soil saturation in the upper 12 inches were observed during the October 2007 and September 2013 field investigations. This wetland has permanently flooded and saturated only water regimes.

## Vegetation

Wetland 13A has three vegetation communities: forested, scrub-shrub, and emergent. The forested community is dominated by red alder in the overstory and Himalayan blackberry and reed canarygrass in the understory. The scrub-shrub community is dominated by Himalayan blackberry with small-fruited bulrush, broadleaf cattail, common ladyfern, and reed canarygrass. The emergent community is dominated by reed canarygrass. Other species in the wetland include Oregon ash, Pacific willow, Douglas fir (*Pseudotsuga menziesii*), peafruit rose (*Rosa pisocarpa*), Pacific ninebark (*Physocarpus capitatus*), giant horsetail, western swordfern, climbing nightshade (*Solanum dulcamara*), American speedwell (*Veronica americana*), bird's-foot trefoil (*Lotus corniculatus*), barnyard grass (*Echinochloa crus-galli*), hedge false bindweed, scouring rush horsetail (*Equisetum hyemale*), slough sedge (*Carex obnupta*), fringed willowherb (*Epilobium ciliatum*), common rush (*Juncus effusus*), softstem bulrush (*Scirpus tabernaemontani*), common duckweed, curly dock (*Rumex crispus*), and woolgrass (*Scirpus cyperinus*).

## Soils

Two soil pits were examined in Wetland 13A. The first soil pit (W13A-SP1) was examined in an emergent vegetation community to a depth of 18 inches and consists of two layers. The surface layer is a 6-inch layer of very dark grayish brown (10YR 3/2) silt loam. The lower layer is a 12-inch layer of dark grayish brown (2.5Y 4/2) gravelly loam with strong brown (7.5YR 4/6) redoximorphic features. The second soil pit (W13A-SP3) was examined in a forested vegetation community to a depth of 18 inches, and consists of three layers. The upper layer is a 7-inch layer of very dark grayish brown (10YR 3/2) silt loam. The middle layer is a 9-inch layer of dark gray (5Y 4/1) silt with dark brown (7.5YR 3/4) redoximorphic features. The lower layer is a 2-inch layer of black (10YR 2.5/1) silt loam with dark reddish brown (5YR 3/4) redoximorphic features. Soil in the area is mapped as Kitsap silt loam.

## Buffer

A vegetated buffer exists upslope between the wetland and East Lake Sammamish Parkway SE. Dominant vegetation in the buffer includes red alder and Himalayan blackberry. Buffer to the southwest is limited by the trail; East Lake Sammamish Shore Lane SE limits the buffer to the northwest. Vegetation in these areas consists of primarily a narrow strip of maintained, disturbance-tolerant, herbaceous vegetation. A vegetated corridor provides connectivity to Wetland 14C to the south. The surrounding area is characterized by single-family residential development.

## Wetland Classification

Wetland 13A is classified as a palustrine forested/palustrine scrub-shrub/palustrine emergent wetland under the Cowardin (1979) system and a depression/slope system under the HGM system (Null et al. 2000; Hruby 2004). Wetland 13A is rated a Category III according to the City of Sammamish and Ecology. This wetland scored 40 points on the rating form of the Washington State Wetland Rating System for Western Washington (10 points for water quality functions, 16 points for hydrologic functions, and 14 points for habitat functions) (see 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 13A 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 14A

Subbasin: Monohon

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional/Riverine

City of Sammamish/Ecology Rating: Category IV

Data Plots: 14A-SP1, 14A-SP2

Stations: 218+25 to 220+50

Size: 0.04 acre

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Wetland 14A is located in a trough on the north side of the trail between two driveways, south of the intersection of East Lake Sammamish Parkway SE and Peregrine Point Way SE (Figure 3-2a). A remnant driveway and culvert (actively conveying water) are present at the north end of the wetland. This wetland is located entirely within the project area, but mostly within the maintained portion of trail corridor.

### Hydrology

Hydrology in Wetland 14A is supported by groundwater seeps, two streams (Unnamed Stream 1 and Unnamed Stream 2), and local area runoff. A culvert under a driveway to the west conveys surface water from Unnamed Stream 2 and Wetland 14C. A culvert passes under East Lake Sammamish Parkway SE and discharges water from Unnamed Stream 1 into the north side of the wetland. A third culvert under a driveway at the south end discharges water from Wetland 3E. Water exits the wetland through a culvert passing under the trail and is piped to private property and Lake Sammamish. Water flowing through all culverts, inundation (up to 6 inches), and soil saturation to the surface was observed during the October 2007 and September 2013 field investigations. This wetland has permanently flooded and saturated only water regimes.

### Vegetation

Wetland 14A is an emergent vegetation community dominated by reed canarygrass and watercress. Other species observed during the field investigation include reed canarygrass, American speedwell, watercress, giant horsetail, small-fruited bulrush, common duckweed, hedge false bindweed, and Himalayan blackberry.

### Soils

Soil in Wetland 14A was examined to a depth of 16 inches and consists of two layers. The upper layer is a 10-inch layer of very dark gray (7.5YR 3/1) silt loam with yellowish red (5YR 4/6) redoximorphic features. The lower layer is a 6-inch layer of gray (10YR 5/1) gravelly loam with dark yellowish brown (10YR 4/6) redoximorphic features. Soil in the area is mapped as Kitsap silt loam.

### Buffer

Wetland 14A is situated between the trail and East Lake Sammamish Parkway SE. Driveways are found at the wetland boundary to the west and the east. The wetland buffer is limited to an area upslope between the wetland and the parkway. Vegetation in the buffer is dominated by Himalayan blackberry. Other species include black cottonwood, Oregon ash, salmonberry (*Rubus spectabilis*), Scotch broom (*Cytisus scoparius*), Japanese knotweed (*Polygonum cuspidatum*), giant horsetail, reed canarygrass, and bracken fern. The surrounding area is characterized by single-family residential development. Lake Sammamish is located beyond a row of houses to the west. The buffer between the trail and the wetland is a narrow band of maintained herbaceous vegetation.



## Wetland Classification

Wetland 14A is classified as a palustrine emergent wetland under the Cowardin (1979) system and a depressional/riverine system under the HGM system (Null et al. 2000; Hruby 2004). Wetland 14A is rated a Category IV according to the City of Sammamish and Ecology. This wetland scored 23 points on the rating form of the Washington State Wetland Rating System for Western Washington (4 points for water quality functions, 10 points for hydrologic functions, and 9 points for habitat functions) (see 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 14A 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 14C*

Subbasin: Monohon

USFWS Classification: Palustrine Emergent

HGM Classification: Depressional/Slope

City of Sammamish/Ecology Rating: Category IV

Data Plots: 14C-SP1, 14C-SP2

Stations: 220+75 to 222+25

Size: 0.05 acre

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Wetland 14C is located on the north side of the trail and west of the intersection of East Lake Sammamish Parkway SE and Peregrine Point Way SE (Figure 3-2a). This wetland is located entirely within the project area, but partially within the maintained portion of trail corridor.

### *Hydrology*

Wetland hydrology is maintained by seasonally high groundwater, seeps, surface water from a pipe under East Lake Sammamish Parkway SE, and local area runoff. The wetland drains through a ditch that runs parallel to the trail. Most of the water flows east to a culvert under a driveway and discharges into Wetland 14A. Water also flows seasonally north to a culvert under the trail. Inundation (up to 6 inches) and soil saturation to the surface was observed in the ditch during site visits conducted in October 2007 and September 2013. This wetland has permanently flooded, seasonally flooded, and saturated only water regimes.

### *Vegetation*

Wetland 14C has an emergent vegetation community dominated by reed canarygrass. The ditch contains small-fruited bulrush, American speedwell, and common duckweed. Other species observed include red alder saplings, Himalayan blackberry, common rush, softstem bulrush, fringed willowherb, giant horsetail, and climbing nightshade.

### *Soils*

Soil in Wetland 14C consisted of a 6-inch very dark gray (10YR 3/1) sandy loam, over a very dark greenish gray (10Y 3/1) sandy loam. Soil in the area is mapped as Kitsap silt loam.

## Buffer

Wetland 14C is situated between the trail and East Lake Sammamish Parkway SE. The area between the wetland and the trail is limited to disturbance-tolerant grasses and forbs. A driveway is located at the wetland boundary to the east. Vegetated buffer is limited to a strip running between the trail and the parkway to the west and an area upslope between the wetland and the parkway. Buffer to the west provides a vegetated corridor to Wetland 13A. These areas are forested and dominated by red alder and Himalayan blackberry. Bigleaf maple, Oregon ash, western swordfern, reed canarygrass, giant horsetail, field horsetail (*Equisetum arvense*) and bracken fern are also present. The surrounding area is characterized by single-family residential development.

## Wetland Classification

Wetland 14C is classified as a palustrine emergent wetland under the Cowardin (1979) system and a depressional/slope system under the HGM system (Null et al. 2000; Hruby 2004). Wetland 14C is rated a Category IV according to the City of Sammamish and Ecology. This wetland scored 27 points on the rating form of the Washington State Wetland Rating System for Western Washington (6 points for water quality functions, 10 points for hydrologic functions, and 11 points for habitat functions) (see 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 14C 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.

## 3.3 Streams

Based on the City's definition, five streams were identified in the project area (Table 3-3; Figures 3-2a through 3-2c). Four of the streams in the South Sammamish Segment A project area 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.

**Table 3-3. Summary of Streams in the Project Area**

Stream Name	Stream Classification <sup>a</sup>	Buffer Width <sup>b</sup> (feet)	Fish Use
Unnamed 1	Type F	150	Unlikely
Unnamed 2	Type F	150	Unlikely
0163 (South Fork)	Type F	150	Yes
0163 (North Fork)	Type F	150	Likely
Unnamed 3	Type F	150	Unlikely

<sup>a</sup> SMC 21A.15.1240 and WAC 222-16-031

<sup>b</sup> SMC 21A.50.330

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 because it is extremely unlikely that all streams that meet the criteria for presumed fish presence and/or contain fish habitat features are currently occupied.

*Unnamed Stream 1*

Subbasin: Monohon

Stream Classification: Type F

Station: 218+45

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Unnamed Stream 1 is located in the south end of Wetland 14A near the southern terminus of the project (Figure 3-2a). This stream receives off-site flow from East Lake Sammamish Parkway SE, Peregrine Point Way SE, and other hillside areas via two drainage outfalls. It also receives flow from Unnamed Stream 2 and Wetland 14C. The stream channel flows south on the east side of the trail to a 24-inch concrete culvert. West of the trail, the stream daylights from the culvert outfall briefly, then flows beneath East Lake Sammamish Shore Lane SE in a 16-inch ductile iron culvert. Finally, the stream flows in an open channel to the lake. The segment of stream within the project area has a bankfull width of 4 to 5.5 feet. The channel is straight and channelized with a 1 percent gradient. The stream bed is densely vegetated with a silt substrate. This stream has no apparent historic natural drainage basin with a catchment area less than 50 acres. For stream buffer conditions, see the description of Wetland 14A. Although fish use is unlikely, Unnamed Stream 1 meets the criteria for presumed fish presence and is therefore classified as a Type F stream. The required buffer width is 150 feet for Type F streams in the city of Sammamish (SMC 21A.50.330).

*Unnamed Stream 2*

Subbasin: Monohon

Stream Classification: Type F

Station: 220+50

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Unnamed Stream 2 is located at the north end of Wetland 14A near the southern terminus of the project (Figure 3-2a). This stream receives off-site flow from East Lake Sammamish Parkway SE and areas to the east. It also receives flow from Wetland 14C. The stream channel flows south on the east side of the trail to its confluence with Unnamed Stream 1 with similar characteristics. The segment of stream within the project area has a bankfull width of 4 to 5.5 feet. The channel is straight and channelized with a 1 percent gradient. The stream bed is densely vegetated with a silt substrate. This stream has no apparent historic natural drainage basin with a catchment area less than 50 acres. For stream buffer conditions, see the description of Wetland 14A. Although fish use is unlikely, Unnamed Stream 2 meets the criteria for presumed fish presence and is therefore classified as a Type F stream. The required buffer width is 150 feet for Type F streams in the city of Sammamish (SMC 21A.50.330).

*Stream 0163 (South Fork and North Fork)*

Subbasin: Monohon

Stream Classification: Type F

Station: 239+60 (South Fork); 241+10 (North Fork)

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Stream 0163 lies in the Monohon Subbasin and is identified as a salmonid-bearing stream. The stream has two forks that join at a location between the trail and Lake Sammamish. WDFW (2014a) maps documented presence for coho salmon (*Oncorhynchus kisutch*) and steelhead (*O. mykiss*), and modeled presence for Chinook salmon (*O. tshawytscha*) and sockeye salmon (*O. nerka*) in the South Fork. WDFW (2014b) maps the occurrence and migration of cutthroat trout (*O. clarki*). Stream 0163 is believed to be suitable for coho salmon (rearing), cutthroat trout (spawning and rearing), and rainbow trout (*O. mykiss*) (rearing) (King County 1990a). The North Fork carries far less volume than the South Fork and is not believed to support fish; it is not accessible to fish because of piping below the trail. Only trace flow was observed in this fork by Parametrix biologists on April 24 and August 9, 2000. The South Fork is 0.7 mile in length with only about 0.1 mile accessible to non-resident fish (King County 1990b). There are no impassable barriers at or downstream of East Lake Sammamish Parkway SE, but a culvert just upstream of the parkway may be a velocity barrier at times. Prior to the creation of the fish barrier(s) near the East Lake Sammamish Parkway SE, this stream likely supported sockeye salmon and/or the landlocked form of the species, kokanee salmon. It may still support some cutthroat and kokanee below East Lake Sammamish Parkway SE. No fish were visually observed by project biologists during field investigations.

The South Fork passes under the trail in a 36-inch diameter concrete pipe. Downstream of the trail, the stream flows in an artificially constructed channel, passing through the backyards of four private residences before emptying into Lake Sammamish. The segment within the project area has a bankfull width ranging from 5 to 7 feet and a dominant substrate of gravel with cobbles. The channel is straight and channelized, with boulders lining the banks downstream of the trail. No large woody debris (LWD) is present. The gradient is 9 percent upstream (east) of the trail and 6 percent downstream (west) of the trail. The South Fork has a catchment area greater than 50 acres.

The North Fork passes under the trail in a 30-inch-diameter concrete pipe. The downstream end of this pipe was not found during field investigations. Private property access was not granted at the time of the field investigations; therefore, no further information can be provided on the North Fork. However, it is assumed that the two forks converge downstream prior to reaching Lake Sammamish. The segment within the project area has a bankfull width of 5.5 feet and a dominant substrate of gravel and sand. The stream is straight and channelized with a gradient of 5 percent. The North Fork has a catchment area less than 50 acres.

Stream buffer vegetation west of the trail (to a cedar fence) consists of a row of western red cedar with a sparse understory of Himalayan blackberry, English ivy (*Hedera helix*), and reed canarygrass. Maintained yards with lawn are present west of the fence. Stream buffer to the east is dominated by Himalayan blackberry and reed canarygrass. A few trees (bigleaf maple and red alder) and red elderberry (*Sambucus racemosa*) are also present. The buffer south of 206th Avenue SE is lawn. A private driveway followed by Wetland 12A and associated buffer are located to the north.

Stream 0163 (South Fork and North Fork) is classified as a Type F stream with a required buffer width of 150 feet (SMC 21A.50.330).

### Unnamed Stream 3

Subbasin: Monohon

Stream Classification: Type F

Station: 256+35

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Unnamed Stream 3 is located in the vicinity of SE 9th Street. The stream channel collects trail runoff and flows south on the east side of the trail to an 18-inch concrete culvert. West of the trail, the stream daylights from the culvert outfall briefly in an open concrete well structure, then flows beneath East Lake Sammamish Shore Lane SE in an 18-inch corrugated metal pipe (CMP) culvert. At the outlet of the 18-inch CMP culvert, the stream waterfalls down 6 feet, and finally flows to Lake Sammamish in an open concrete and cobblestone channel.

Unnamed Stream 3 flows onto the site via a culvert beneath East Lake Sammamish Parkway SE, and receives off-site flow from a driveway and ditch. The segment of stream within the project area has a bankfull width of 5 to 5.5 feet. The channel is straight and channelized with a less than 1 percent gradient. The stream bed is densely vegetated with a silt substrate. King County Parks Maintenance manages the sedimentation that occurs in Unnamed Stream 3 on a regular basis.

The buffer between the trail and the stream is maintained grass. Himalayan blackberry is dominant on the east side of the stream to East Lake Sammamish Parkway SE. The west side of the trail is narrow with varying areas of landscaped plants, Himalayan blackberry, and maintained grasses. An Oregon ash, bigleaf maple, and row of western red cedar are located at the north end.

This stream has a catchment area less than 50 acres. Although fish use is unlikely, Unnamed Stream 3 meets the criteria for presumed fish presence and is therefore classified as a Type F stream. The required buffer width is 150 feet for Type F streams in the city of Sammamish (SMC 21A.50.330).

## 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 1990a). 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 East Lake Sammamish Parkway SE 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 1990a; Pfeifer 1992). Other than one unconfirmed anecdotal account, there is no documentation of bull trout (*Salvelinus confluentus*) 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 (*Micropterus salmoides*), yellow perch (*Perca flavescens*), brown bullhead (*Ameiurus nebulosus*), and black crappie (*Pomoxis nigromaculatus*) (King County 1990a).

Lake Sammamish is a shoreline of the state, regulated under the City of Sammamish SMP (effective August 31, 2011). The City Shoreline Designation Maps show the project area falling within the Shoreline

Residential shoreline designation. According to SMP 25.06.020(9), Lake Sammamish has a 50-foot shoreline setback. Residential structures, lawn, and associated landscaping cover most of the setback in the project area.

### 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 South Sammamish Segment A 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, natural resource conservation areas, or wildlife habitat corridors in the project area. Three bald eagle breeding areas (nests) are mapped northeast of the trail and East Lake Sammamish Parkway SE, one of which is mapped within 660 feet (approximately 330 feet) of the trail. Bald eagles are a federal species of concern and state sensitive species.

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. There is one group B water supply well near the trail intersection at SE 33rd Street.

## 4. IMPACT ASSESSMENT

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

### 4.1 Wetlands

No wetlands will be permanently affected by this project. However, a small amount of temporary impacts on four wetlands and some permanent and temporary impacts on buffers are unavoidable (Table 4-1; Appendix E). 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 <sup>a</sup>	Wetland		Buffer	
		Perm. Impacts acres (SF)	Temp. Impacts acres (SF)	Perm. Impacts acres (SF)	Temp. Impacts acres (SF)
3E	IV	-	<0.01 (20)	0.01 (533)	0.02 (681)
12A	III	-	<0.01 (11)	0.04 (1,675)	0.11 (4,608)
13A	III	-	<0.01 (263)	0.16 (7,091)	0.34 (14,715)
14A	IV	-	<0.01 (52)	0.04 (1,644)	0.06 (2,686)
14C	IV	-	-	0.03 (1,265)	0.03 (1,460)
<b>Total</b>		-	<b>&lt;0.01 (346)</b>	<b>0.28 (12,208)</b>	<b>0.55 (24,150)</b>

<sup>a</sup> Hruby (2004), as specified in SMC 21A.50.290

Perm. = Permanent, Temp. = Temporary, SF = square feet

#### 4.1.1 Temporary Wetland Impacts

An existing clay pipe associated with Wetland 13A 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 less than 0.01 acre (263 square feet) of wetland (see Appendix E, Figure 2). Additionally, 20 square feet of Wetland 3E, 11 square feet of Wetland 12A, and 52 square feet of Wetland 14A will be temporarily disturbed to accommodate construction. Vegetation in these areas consists mostly of reed canarygrass, Himalayan blackberry, and disturbance-tolerant herbaceous species. Temporarily disturbed wetlands will be restored by reseeding or replanting with appropriate native species when construction activities are finished.

#### 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 will result in permanent wetland buffer impacts include trail widening and driveway reconfigurations.

The project will permanently affect portions of all five wetland buffers (Table 4-1). Approximately 0.28 acre of wetland buffer will be eliminated as a result of trail widening and realignment. The buffer of Wetland 13A will have the largest affected area (0.16 acre), which accounts for nearly 60 percent of the total permanent buffer impacts. The remaining affected wetland buffer areas are 0.04 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. These areas are vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and some patches of native trees and shrubs. Minimal effects on wetland buffer functions are anticipated.

### 4.1.3 Temporary Wetland Buffer Impacts

The buffer of all five wetlands will be temporarily affected during construction. In total, construction will temporarily affect 0.55 acre of wetland buffer (Table 4-1). Temporary impacts on wetland buffers consist of minor clearing and grading outside of the trail footprint to enable project construction and replacement of some existing retaining walls. The construction work areas along the edge of the proposed trail have been conservatively estimated for this project. The majority of the wetland buffers to be cleared and graded are vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and some patches of native trees and shrubs. 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. Temporarily disturbed buffers will also be restored by reseeded or replanting with appropriate native species when construction activities are finished.

## 4.2 Streams

No permanent or temporary impacts will occur to project streams. Although the project was designed with specific features to avoid and minimize impacts on critical areas, some unavoidable impacts on stream buffers will occur (Table 4-2; see Appendix E). 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.

**Table 4-2. Summary of Impacts on Stream Buffers**

Stream	Stream Classification <sup>a</sup>	Stream		Buffer	
		Perm. Impact acres (SF)	Temp. Impact acres (SF)	Perm. Impact acres (SF)	Temp. Impact acres (SF)
Unnamed 1	Type F	-	-	-	-
Unnamed 2	Type F	-	-	-	-
0163 (South Fork)	Type F	-	-	0.03 (1,123)	0.07 (3,015)
0163 (North Fork)	Type F	-	-	0.04 (1,604)	0.08 (3,456)
Unnamed 3	Type F	-	-	0.08 (3,571)	0.14 (6,244)
<b>Total</b>		<b>-</b>	<b>-</b>	<b>0.14 (6,298)</b>	<b>0.29 (12,715)</b>

<sup>a</sup> SMC 21A.15.1240 and WAC 222-16-031

Perm. = Permanent, Temp. = Temporary, SF = square feet



Stream buffers are important, contributing both directly and indirectly to the health of streams and the fish that inhabit those streams. Properly functioning stream buffers provide stream shade and a source of 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 functions 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 the habitat needs of salmonids (cold, clear water; habitat complexity; and in-stream cover).

#### 4.2.1 Permanent Stream Buffer Impacts

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 will result in permanent stream buffer impacts include trail widening and driveway reconfigurations.

The project will result in total permanent clearing of 0.14 acre of buffer associated with three streams (Table 4-2). Impacts on buffers of each individual stream will be 0.08 acre or less. Most of the stream buffers to be affected by the project are narrow linear swathes immediately adjacent to the Interim Use Trail. These buffers are vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and some patches of native trees and shrubs. Minimal effects on stream buffer functions are anticipated.

#### 4.2.2 Temporary Stream Buffer Impacts

The buffers of three streams will be temporarily affected during construction. In total, construction will temporarily affect 0.29 acre of stream buffer (Table 4-2). Temporary impacts on stream buffers consist of minor clearing and grading outside of the trail footprint to enable project construction. These construction work areas have been conservatively estimated for this project. Most of the stream buffers to be cleared and graded are vegetated with herbaceous species that are currently disturbed by routine trail maintenance activities, landscaped plants associated with adjacent residences, Himalayan blackberry, and some patches of native trees and shrubs. 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. Temporarily disturbed buffers will also be restored by reseeding or replanting with appropriate native species when construction activities are finished.

### 4.3 Lake Sammamish and Shoreline Setback

No impacts will occur to Lake Sammamish or the shoreline setback.

## 4.4 Fish and Wildlife Habitat Conservation Areas

Bald eagles are a federal species of concern and state sensitive species. The Washington Fish and Wildlife Commission amended the bald eagle protection rules (WAC 232-12-292), removing the requirement that landowners develop bald eagle management plans. Now that the state no longer requires a plan, the responsibility for bald eagle management has shifted from the WDFW to the USFWS, which is responsible for enforcing the Bald and Golden Eagle Protection Act. The USFWS developed the National Bald Eagle Management Guidelines (USFWS 2007), a tool for landowners and planners who seek information and recommendations regarding compliance with the Act. The Guidelines are intended to help people minimize impacts to bald eagles, including impacts that constitute disturbance. Recommended measures for minimizing the risk of disturbance include (1) keeping a distance between the activity and the nest (disturbance buffers), (2) maintaining preferably forested (or natural) areas between the activity and around nest trees (landscape buffers), and (3) avoiding certain activities within 660 feet of bald eagle nests during the breeding season (typically January 1 through August 15 in Washington State).

The County does not expect trail construction activities within 660 feet of the bald eagle nest to result in substantial disturbance to bald eagles based on current surrounding land uses and activities. The nest is surrounded by residential development with approximately 5 single-family dwellings within 330 feet, and approximately 30 single-family dwellings (20 of which are on the Lake Sammamish waterfront) and 10 multifamily structures within 660 feet. Activities associated with the residences include yard and house maintenance (e.g., lawn mowing, leaf blowing), as well as social gatherings and recreational activities. The East Lake Sammamish Parkway and local neighborhood roads with vehicular and bicycle traffic are also within the 330-foot and 660-foot distances, and pedestrians and bicyclists currently use the Interim Use Trail.

Trail construction duration is anticipated to be 150 days, some of which may be within the breeding season. Typical construction activities that would occur within 660 feet of the nest include site preparation and temporary erosion and sedimentation control (TESC) installation, clearing and grubbing, and removals (approximately 12 days); retaining wall installation (approximately 30 days); drainage (approximately 5 days); earthwork (approximately 4 days); trail and driveway crushed surfacing and paving (approximately 5 days); and finishing work—planting, striping, signing, fencing (approximately 10 days). Pile driving may be required to construct the stormwater vault for the drainage, but this activity would not occur within the breeding season (January 1 through August 15). Construction of the trail would otherwise not require any major noise-generating activities (e.g., blasting). Construction noise precautions are also taken to minimize noise to adjacent residents. During clearing, no trees greater than 22-inch diameter at breast height would be removed within 660 feet from the nest. No stockpiling or staging would occur within 660 feet of the nest (from Station 216+50 to 226+75). Where practical, native evergreen vegetation will be incorporated into the landscape plan for year-round screening within 660 feet of the nest.

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 4.1, 4.2, and 4.3 for impacts on wetlands, streams, and Lake Sammamish.

## 4.5 Critical Aquifer Recharge Areas

The city code provides groundwater quality and quantity protection standards for development within CARAs (SMC 21A.50.280). The new trail surface will be non-pollution generating impervious surface; therefore, water quality treatment facilities are not required. Although the project proposes driveway reconfigurations, there are no target areas within the project requiring water quality treatment (Parametrix 2014). Nine threshold discharge areas<sup>1</sup> (TDAs) were identified within the project area (Parametrix 2014). Project TDAs are delineated in three ways: areas that runoff directly to the lake via overland flow or manmade conveyance, areas that runoff directly to streams that cross the trail and flow into Lake Sammamish, and areas that runoff to adjacent private property landscaping. The trail has qualified for an exemption from the flow control facilities in seven of the nine TDAs (Parametrix 2014). The remaining TDAs will use infiltration trenches to meet flow control requirements.

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<sup>1</sup> Threshold discharge area is defined as an on-site area draining to a single natural discharge location, or to multiple natural discharge locations that combine within one-quarter mile downstream, as determined by the shortest flowpath (SMC 24.06.040).



## 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).

### 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. This is consistent with SMC 21A.30.210(1) that states trails should generally be located along existing cleared areas or on improved corridors. With this alignment, permanent impacts to wetlands will be avoided, permanent impacts to streams will be avoided, and permanent buffer impacts are limited to the area needed to widen the existing trail. The current design also incorporates the following strategies to minimize impacts to the critical areas and buffers:

- **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 seven retaining walls for a total of 1,068 linear feet 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. 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 a split-rail fence between the trail and an adjacent critical area, unless an edge hazard warrants a different type 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 TESC plan and construction stormwater pollution prevention plan (SWPPP) will be implemented to minimize and control pollution and erosion from stormwater.

## 5.2 Restoration of Temporary Impacts

Temporary impacts on wetlands (less than 0.01 acre), wetland buffers (0.55 acre), and stream buffers (0.29 acre) 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 when construction activities are finished.

## 5.3 Compensatory Mitigation

In spite of the avoidance and minimization efforts above, 0.28 acre of permanent impacts to the wetland buffer and 0.14 acre of permanent impacts to the stream buffer are unavoidable. Because permanent impacts on wetland buffers and stream buffers could not be completely avoided, King County will replace the area and functions lost through compensatory mitigation. Mitigation areas are shown on the landscape plans in Appendix F that were prepared as part of the 95 percent plan submittal. Current impacts included in this CAS were analyzed subsequent to finalization of the 95 percent plan set; therefore, areas reported in this section vary slightly from that shown on the landscape plans. The mitigation areas will be revised on the landscape plans prior to advertisement to reflect mitigation needs based on the current impact analysis.

### 5.3.1 Wetland Buffers

#### 5.3.1.1 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 are also required to provide equivalent or greater functions and values compared to conditions existing prior to the proposed alteration. To offset unavoidable impacts to wetland buffers, King County is proposing a combination of increasing wetland buffer widths and enhancing areas within the standard regulatory wetland buffer. King County is proposing to increase the buffer around two wetlands at a minimum 1:1 mitigation ratio to satisfy the City's requirement of no net loss of area. This increased buffer would be enhanced where feasible. In addition, the County is proposing to enhance a portion of one wetland and two areas of wetland buffer at a minimum 1:1 mitigation ratio to increase the functions and values.

#### 5.3.1.2 Site Selection

The City of Sammamish prefers that mitigation actions be in-kind and conducted within the same subbasin and on the same site as the alteration (SMC 21A.50.310). The right-of-way consists of a long, linear corridor that abuts portions of five 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 identify on-site mitigation areas with available acreage and the opportunity to increase the ecological benefit at four consolidated locations in the corridor (Appendix F). 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.

### 5.3.1.3 Proposed Mitigation

King County is proposing to complete compensatory mitigation at four consolidated sites in the Master Plan Trail right-of-way (Appendix F). The proposed mitigation will include a minimum of 0.28 acre of increased (and enhanced) wetland buffer and 0.26 acre of wetland buffer enhancement, as well as 0.02 acre of wetland enhancement to offset 0.28 acre of permanent wetland buffer impacts. Generally, the proposed mitigation sites are currently dominated by invasive species (e.g., Himalayan blackberry, reed canarygrass, and Scotch broom) and maintained lawn, but is devoid of native trees and shrubs. The proposed compensatory mitigation will include removing invasive vegetation and lawn, 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 wetland buffer enhancement areas. Fencing will be installed and maintained along the trail adjacent to all mitigation areas to minimize intrusion and disturbance.

## 5.3.2 Stream Buffers

### 5.3.2.1 Regulatory Requirements

Similar to wetland buffer mitigation requirements, mitigation for alteration to stream buffers is required to achieve equivalent or greater functions (SMC 21A.50.350). King County is proposing a 1:1 mitigation ratio for impacts on stream buffers by applying enhancement.

### 5.3.2.2 Site Selection

The City of Sammamish prefers that mitigation actions be in-kind and conducted within the same subbasin and on the same site as the alteration (SMC 21A.50.350). The right-of-way consists of a long, linear corridor that abuts small portions of stream buffer, and the possibility was considered that mitigation areas in the trail corridor could be small and fragmented. However, the project team was able to reduce impacts on stream buffers, thereby decreasing mitigation needs to the point that on-site mitigation with available acreage and the opportunity to increase the ecological benefit could be proposed at one consolidated location in the corridor. A site adjacent to the trail typically offers easy access for both construction and maintenance with minimal disturbance to other habitats.

Locations associated with each project area stream were considered for stream buffer mitigation. Unnamed Stream 1, Unnamed Stream 2, and Unnamed Stream 3 are smaller than Stream 0163 and do not have documented salmonid presence. Therefore, sites associated with Unnamed Stream 1, Unnamed Stream 2, and Unnamed Stream 3 were lower priority. In addition, many of these unnamed streams have a lower chance of success. The buffer of Unnamed Stream 1 and Unnamed Stream 2 (east of the trail), and portions of Unnamed Stream 3 buffer (east of the trail) would be difficult to access for construction equipment conducting site preparation due to steep slopes, limited access points, and a narrow work area. Steep slopes also pose challenges for plant establishment and are prone to soil erosion.

Stream 0163, South Fork's buffer southeast of 206th Avenue SE, is limited by several underground utilities near the stream that may be unsuitable for plant installation. Also, there would be a potential conflict with the existing recreational use of the maintained lawn. The buffer northwest of Stream 0163

(North Fork) on the opposite side of the driveway would not provide a large benefit because the enhanced buffer would be separated from the stream by this driveway.

The proposed mitigation includes the area between the South and North Forks of Stream 0163 on the east side of the trail, and a small area immediately adjacent to the South Fork southeast of 206th Avenue SE. This site was selected as the best on-site mitigation because it would enhance the highest quality stream in the project area with the greatest chance of attaining success. Stream 0163 is the only project area stream that has documented salmonid presence. This site has a high likelihood of success given that there are existing trees on site to provide partial shade for most of the site and no invasive vegetation will be immediately adjacent to the planting areas following plant installation. This mitigation will add to the habitat complexity, connectivity, and biological functions between the North and South Forks of Stream 0163. The on-site area will provide an opportunity for visual and aural screening of East Lake Sammamish Parkway SE for both wildlife and trail users. The site and proposed mitigation are discussed in the following sections.

### 5.3.2.3 Proposed Mitigation

King County is proposing to complete compensatory mitigation for all permanent stream buffer impacts by constructing South Sammamish Segment A at one consolidated site in the Master Plan Trail right-of-way, on the east side of the trail, between the South and North Forks of Stream 0163 (Appendix F). The proposed mitigation site is currently dominated by invasive species (Himalayan blackberry and reed canarygrass). The proposed mitigation will include 0.14 acre of stream buffer enhancement to offset 0.14 acre of permanent stream buffer impacts. This will involve removing invasive vegetation, tilling and amending soil, adding mulch, and planting with native vegetation. Existing desirable vegetation will be protected where feasible. Deciduous and coniferous tree species and shrubs will be planted to increase native 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 enhancement area. Fencing will be installed and maintained along the trail adjacent to the mitigation area to minimize intrusion and disturbance.

### 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. Specific goals and objectives formulated to achieve this result are presented below.

#### Mitigation Goals

The mitigation goals are:

- Increase and enhance the buffer of two wetlands (Wetlands 12A and 13A) by 0.28 acre.
- Enhance 0.26 acre within the existing regulatory buffer of two wetlands (Wetlands 13A and 14A).
- Enhance 0.02 acre of existing wetland (Wetland 13A).
- Enhance 0.14 acre of existing stream buffer (South Fork of Stream 0163).



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

- Increase the production of organic matter by planting trees and shrubs in wetland, wetland buffer, and stream buffer areas.
- Increase fish and wildlife habitat and improve biological diversity by installing habitat features (habitat logs and brush piles) and planting with a variety of native plant species that will create multiple vegetation strata as they mature.
- Increase visual and aural screening of East Lake Sammamish Parkway SE and the trail for wildlife protection and habitat connectivity.

## Mitigation Objectives and Performance Standards

### ***Buffer Plant Communities***

**Objective 1:** Establish a minimum of 0.54-acre native forest and shrub wetland buffer (at the increased wetland buffer and wetland buffer enhancement areas) and 0.14-acre native forest and shrub stream buffer.

#### **Performance Standards:**

- |        |  |
|--------|--|
| Year 1 | Survival of planted woody species in the enhanced wetland buffer and enhanced stream buffer 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 and enhanced stream buffer. |
| Year 5 | Native woody species will achieve a minimum of 60 percent areal cover in the enhanced wetland buffer and enhanced stream buffer. |

**Objective 2:** Limit invasive non-native species throughout the enhanced wetland buffer and enhanced stream buffer mitigation planting areas.

#### ***Performance Standard:***

- |           |  |
|-----------|--|
| Years 1–5 | King County-listed Class A and regulated Class B and C noxious weeds, Himalayan blackberry, cutleaf blackberry, Scotch broom, butterfly bush ( <i>Buddleia davidii</i> ), English ivy, and reed canarygrass will not exceed 20 percent areal cover in the planting area. |
|-----------|--|

### ***Wetland Plant Community***

**Objective 3:** Establish a minimum of 0.02-acre native shrub wetland.

#### **Performance Standards:**

- |        |  |
|--------|--|
| Year 1 | Survival of planted willow stakes in the enhanced wetland will be at least 80 percent.         |
| Year 3 | Native woody species will achieve a minimum of 35 percent areal cover in the enhanced wetland. |
| Year 5 | Native woody species will achieve a minimum of 60 percent areal cover in the enhanced wetland. |

**Objective 4:** Limit invasive non-native species cover throughout the mitigation site planting area.

***Performance Standard:***

Years 1–5      King County-listed Class A and regulated Class B and C noxious weeds, Himalayan blackberry, cutleaf blackberry, Scotch broom, butterfly bush, and English ivy will not exceed 10 percent areal cover in the planting area.

***Wildlife Habitat***

**Objective 5: Provide enhanced wetland, riparian, and upland wildlife habitat.**

***Performance Standards:***

Years 1, 3, 5      The increase in areal cover of native woody species in the increased wetland buffer, enhanced wetland buffer, enhanced wetland, and enhanced stream buffer, as measured in Objectives 1 and 3, will be used as a surrogate to indicate increasing habitat functions.

Years 1, 3, 5      The installed habitat features (e.g., habitat logs and brush piles) are to be present and functional.

Year 5              The habitat structure will provide multiple layers as trees and shrubs grow in the enhanced wetland buffer, enhanced wetland, and enhanced stream buffer.

***Anthropogenic Disturbance***

**Objective 6: Protect the mitigation sites from anthropogenic disturbance.**

***Performance Standards:***

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.

***Photo-documentation of Site Development***

**Objective 7: Document site development with photographs.**

***Performance Standard:***

Permanent photographic stations will be established to monitor the development of the enhanced wetland buffer and enhanced stream buffer mitigation sites. Photographs will be taken from transect end posts and from vantage points that capture the general mitigation areas. All photographs will be labeled to identify locations.

## 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 site preparation and planting) will be coordinated to ensure that the site is constructed as designed.

After construction is completed, monitoring will be performed annually to ensure that the goals and objectives of the mitigation efforts 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.50.350). 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, photographic evidence to document site development, and data collection for the quantitative evaluation of performance standards. The results of the monitoring will be submitted to applicable permitting agencies.

Appropriate contingency measures will be developed, as needed, by a qualified professional to ensure that the site develops 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 (Years 1, 3, and 5), monitoring schedule, and report deadlines:

- The mitigation sites will be assessed by an appropriate quantitative field methodology to evaluate vegetative cover (e.g., the line intercept method) for determining the percent of areal cover for desirable woody species and invasive species.
- The presence of installed habitat features will be assessed each year during vegetation monitoring.
- 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 site from permanent photograph stations.

### 6.1.2 Qualitative Monitoring

Qualitative assessments 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.

The planted vegetation species should be adapted to varying site conditions in the Puget Sound lowland; however, 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 the distances generally found 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 plant 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.

Additionally, application of an herbivore repellent (e.g., Plantskydd®) may be necessary for all plants within the site upon completion of plant installation to minimize browse and other damage to plants from wildlife during the establishment period.

## 6.3 Contingency Measures

If monitoring indicates that the site is 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 countermeasures.

**Table 6-1. Contingency Measures for the Mitigation Sites**

<b>Problem</b>	<b>Contingency Measure</b>
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 Year 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 they have 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 #: 3E-SP1  
Wetland: 3E

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

Project/Site: ELST Re-delineation Date: 10/24/2007 Revised 09-11-13  
Applicant/Owner: King County County: King  
Investigator: Erik Christensen State: WA  
☐ 1987 Method ☒ 1977 WA St. Method Community ID: PEM  
Do Normal Circumstances exist on the site? Yes X No        Field Plot ID: 3E-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 13' west of flag 24.*

**09-11-13 Observations** - Quarry spalls and sediment deposition in sample plot vicinity.

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
✓ 1.	Nasturtium officinale	100	Herb	OBL
2.	Phalaris arundinacea	trace	Herb	FACW
3.	Scirpus microcarpus	10	Herb	OBL
4.	Rubus armeniacus	15	Shrub	FACU
5.	Alnus rubra	15	Tree	FAC

#### **09-11-13 Observations**

Nasturtium officinale 30%  
Phalaris arundinacea 30%  
Scirpus microcarpus 10%  
Rubus armeniacus (overhanging) 15%  
Alnus rubra (overhanging) 5%  
Glyceria striata 10%

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. Rubus armeniacus is primarily in upland.*

### 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:

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

**Field Observations:**

Depth of Surface Water:   1   (in.)  
Depth to Free Water in Pit: none (in.)  
Depth to Saturated Soil: surface (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 to the surface and inundation satisfy the wetland hydrology criterion.*

**09-11-13 Observations** - Saturated to surface south of quarry spalls.



# Parametrix

Data Plot #: 3E-SP1

Wetland: 3E

Project/Site: ELST Re-delineation

Date: 10/24/2007

Revised 09-11-13

## SOIL

### Soil Survey Data:

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

Drainage Class: Somewhat Excessively 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.
0-5	A	10YR 2/1	none	none	mucky loam
5-10	B1	2.5Y 4/1	none	none	loamy sand
10-16	B2	2.5Y 3/1	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 checked="" type="checkbox"/> High Organic Content in Surface Layer	

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

Low chroma soil matrix and high organic content in portions of the soil profile indicate hydric soil.

## 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 #: 3E-SP2  
Wetland: Upland near 3E

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

Project/Site: ELST Re-delineation Date: 10/24/2007 Revisited 09-11-13  
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: 3E-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 13' east of flag 37.*

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
✓ 1.	Rubus armeniacus	100	Shrub	FACU
2.	Spiraea douglasii	10	Shrub	FACW
✓ 3.	Alnus rubra	75	Tree	FAC

#### 09-11-13 Observations

Rubus armeniacus 100%  
Salix lucida 20%  
Alnus rubra 60%

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: 15 (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 are present. Wetland hydrology criterion is not satisfied.*

# Parametrix

Data Plot #: 3E-SP2  
Wetland: Upland near 3E

Project/Site: ELST Re-delineation

Date: 10/24/2007

Revisited 09-11-13

## 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.
0-7	A	10YR 3/2	none	none	loam
7-15	B	10YR 3/2	10YR 5/6, 2.5Y 4/2	few, fine, prominent/faint	clay 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.):

Low chroma soil matrix with redoximorphic features 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 and hydrology criteria are not satisfied. Therefore, the sample plot is not located in a wetland.

# Parametrix

Data Plot #: 12A-SP1

Wetland: 12A

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

Project/Site: ELST Re-delineation

Date: 10/31/2007

Revisited 09-12-13

Applicant/Owner: King County

County: King

Investigator: Erik Christensen

State: WA

☐ 1987 Method

☒ 1997 WA St. Method

Community ID: PFO

Do Normal Circumstances exist on the site? Yes X No     

Field Plot ID: 12A-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 data plot is located approximately 20 feet north/northeast of a small (15') cedar sapling growing next to the trail, just under the southern edge of alder canopy in a topographic low. Pit is 12 feet east of the trail. The area is just north of a paved road accessing the 4100 block of houses.*

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
✓ 1.	Phalaris arundinacea	50	H	FACW
✓ 2.	Rubus armeniacus	50	S	FACU
✓ 3.	Alnus rubra	50	T	FAC

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.):

*More than 50 percent 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

**Field Observations:**

Depth of Surface Water: 8 (in.)  
Depth to Free Water in Pit: surface (in.)  
Depth to Saturated Soil: surface (in.)

**Wetland Hydrology Indicators** (Describe in Remarks):

Primary Indicators:

X 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.):

*The presence of hydrology was confirmed during site visits conducted in January of 2008.*

**09-12-13 Observations** - No hydrology (saturated soil or free water in pit) observed at sample plot location or in any other portion of wetland.

**02-21-14 Observations** - Lower area of wetland has up to 3 inches standing water, remainder of area is saturated to the surface.

**03-11-14 Observations** - Up to 9 inches standing water in wetland, remainder of area saturated to the surface.

# Parametrix

Data Plot #: 12A-SP1

Wetland: 12A

Project/Site: ELST Re-delineation

Date: 10/31/2007

Revised 09-12-13

## SOIL

### Soil Survey Data:

Map Unit Name: Everett gravelly sandy loam 5 to 15% slopes

Drainage Class: Somewhat excessively 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.
0-13	A	10YR 3/1	none	none	silt loam
13-18	B	2.5Y 4/2	5YR 5/8	common, medium, prominent	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 Peraguiic 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.):

Chroma 1 soil matrix colors 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

Hydrophytic vegetation, wetland hydrology, and hydric soil criteria are satisfied. Therefore, the sample plot is located in a wetland.



# Parametrix

Data Plot #: 12A-SP2  
Wetland: Upland near 12A

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

Project/Site: ELST Re-delineation Date: 1/8/2008 Revisited 09-12-13  
Applicant/Owner: King County County: King  
Investigator: Matt Maynard 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: 12A-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 3 feet south of Flag 12A-2.*

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Phalaris arundinacea	trace	Herb	FACW
✓ 2.	Rubus armeniacus	80	Shrub	FACU
✓ 3.	Alnus rubra	40	Tree	FAC

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: 13 (in.)  
Depth to Saturated Soil: 5 (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.):  
*Some seepage observed on one side of the pit at 5". Saturation in the upper 12 inches satisfies wetland hydrology criterion.*

**09-12-13 Observations** - No hydrology indicators observed at sample plot location.

# Parametrix

Data Plot #: 12A-SP2  
Wetland: Upland near 12A

Project/Site: ELST Re-delineation

Date: 1/8/2008

Revisited 09-12-13

## SOIL

### Soil Survey Data:

Map Unit Name: Everett gravelly sandy loam 5 to 15% slopes

Drainage Class: Somewhat Excessively 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 3/2	none	none	fine sandy loam
6-16	B	2.5Y 4/1	7.5YR 5/6	common, medium	fine 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 Peraguiic 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 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 checked="" type="checkbox"/> No <input type="checkbox"/>
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

### Remarks

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

# Parametrix

Data Plot #: 13A-SP1

Wetland: 13A

## WETLAND DETERMINATION

(Modified from: 1987 ACOE Wetlands Delineation Manual)

Project/Site: ELST Re-delineation

Date: 10/30/2007

Revisited 09-11-13

Applicant/Owner: King County

County: King

Investigator: Colin Worsley, Erik Christensen

State: WA

☐ 1987 Method

☒ 1997 WA St. Method

Community ID: PEM

Do Normal Circumstances exist on the site? Yes ☒ No ☐

Field Plot ID: 13A-SP1

Is the site significantly disturbed (Atypical Situation)? Yes ☐ No ☒

Is the area a potential Problem Area? Yes ☐ No ☒

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

*This sample plot is located approximately 15 feet south/southwest of a culvert and flag W13A-5. The sample plot is also located approximately 25 feet west of a large Acer macrophyllum with a curved trunk.*

## VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Juncus effusus	trace	Herb	FACW+
✓ 2.	Phalaris arundinacea	100	Herb	FACW
3.	Typha latifolia	trace	Herb	OBL
✓ 4.	Rubus armeniacus	20	Shrub	FACU
5.	Alnus rubra	trace	Tree	FAC

### 09-11-13 Observations

Juncus effusus trace  
Phalaris arundinacea 100%  
Lotus corniculatus 40%  
Rubus armeniacus 20%

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.):

*Rubus armeniacus is rooted outside of the wetland and overhangs to provide vegetative 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  
☒ 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: 15 (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.*

**09-11-13 Observations** - Saturated at 10 inches below surface. Free water in pit at 15 inches below surface.

# Parametrix

Data Plot #: 13A-SP1

Wetland: 13A

Project/Site: ELST Re-delineation

Date: 10/30/2007

Revised 09-11-13

## 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 3/2	none	none	silt loam
6-18	B	2.5Y 4/2	7.5YR 4/6	common, medium, prominent	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 Peraguiic 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.):

Depletions (2.5Y 4/1) were common in the B horizon. Low chroma matrix colors and the presence of redoximorphic features indicate hydric soils.

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes ☒ No ☐

Hydric Soils Present? Yes ☒ No ☐

Wetland Hydrology Present? Yes ☒ No ☐

Is this Sampling Point Within a Wetland?

Yes ☒ No ☐

### Remarks

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

# Parametrix

Data Plot #: 13A-SP2  
Wetland: Upland near 13A

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

Project/Site: ELST Re-delineation Date: 10/30/2007 Revisited 09-11-13  
Applicant/Owner: King county County: King  
Investigator: Colin Worsley, 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: 13A-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 on the slope northeast of the wetland approximately 10 feet north/northwest of wetland flag W13A-4 and 5 feet west of a large Acer macrophyllum with a curved trunk.

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Equisetum telmateia	5	Herb	FACW
2.	Phalaris arundinacea	5	Herb	FACW
✓ 3.	Rubus armeniacus	50	Shrub	FACU
✓ 4.	Acer macrophyllum	75	Tree	FACU

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 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 primary or secondary indicators of hydrology are present. Wetland hydrology criterion is not satisfied.

# Parametrix

Data Plot #: 13A-SP2  
Wetland: Upland near 13A

Project/Site: ELST Re-delineation

Date: 10/30/2007

Revisited 09-11-13

## 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	loam
8-18	B	2.5Y 4/3	none	none	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 Peraguiic 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.*

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes ☐ No ☒

Hydric Soils Present? Yes ☐ No ☒

Wetland Hydrology Present? Yes ☐ No ☒

Is this Sampling Point Within a Wetland?

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 #: 13A-SP3

Wetland: 13A

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

Project/Site: ELST Re-delineation

Date: 10/30/2007

Revisited 09-11-13

Applicant/Owner: King County

County: King

Investigator: Colin Worsley, Erik Christesen

State: WA

☐ 1987 Method

☒ 1997 WA St. Method

Community ID: PFO

Do Normal Circumstances exist on the site? Yes ☒ No ☐

Field Plot ID: 13A-SP3

Is the site significantly disturbed (Atypical Situation)? Yes ☐ No ☒

Is the area a potential Problem Area? Yes ☐ No ☒

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

*This sample plot is located approximately 12 feet north of flag W13A-40.*

**09-11-13 Observations** - Did not re-locate exact location. Dug soil pit in vicinity. Had similar soils and saturated soil at 12 inches below surface.

## VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Convolvulus sepium	5	Herb	FAC
✓ 2.	Phalaris arundinacea	70	Herb	FACW
✓ 3.	Rosa pisocarpa	20	Shrub	FAC
✓ 4.	Rubus armeniacus	20	Shrub	FACU
✓ 5.	Alnus rubra	70	Tree	FAC

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

75

**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  
☒ No Recorded Data Available

**Field Observations:**

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

*Saturation to the surface satisfies wetland hydrology criterion.*

**09-11-13 Observations** - Did not re-locate exact location. Dug soil pit in vicinity. Had similar soils and saturated soil at 12 inches below surface.

# Parametrix

Data Plot #: 13A-SP3

Wetland: 13A

Project/Site: ELST Re-delineation

Date: 10/30/2007

Revised 09-11-13

## 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.
0-7	A	10YR 3/2	none	none	silt loam
7-16	B1	5Y 4/1	7.5YR 3/4	common, medium, prominent	silt
16-18	B2	10YR 2.5/1	5YR 3/4	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 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 matrix colors with redoximorphic features indicate hydric soils.

## WETLAND DETERMINATION

Hydrophytic Vegetation Present?

Yes ☒ No ☐

Hydric Soils Present?

Yes ☒ No ☐

Wetland Hydrology Present?

Yes ☒ No ☐

Is this Sampling Point Within a Wetland?

Yes ☒ No ☐

### Remarks

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

# Parametrix

Data Plot #: 14A-SP1

Wetland: 14A

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

Project/Site: ELST Re-delineation

Date: 10/24/2007

Revisited 09-11-13

Applicant/Owner: King County

County: King

Investigator: Chip 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: 14A-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 5 feet southwest of flag W14A-4.*

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Equisetum telmateia	10	Herb	FACW
✓ 2.	Phalaris arundinacea	90	Herb	FACW
3.	Rubus armeniacus	10	Shrub	FACU
4.	Rubus laciniatus	15	Shrub	FACU+
5.	Fraxinus latifolia	trace	Tree	FACW

### 09-11-13 Observations

Equisetum telmateia 10%  
Phalaris arundinacea 90%  
Rubus armeniacus (overhanging) 10%  
Rubus laciniatus (overhanging) 5%  
Fraxinus latifolia (overhanging) trace  
Nasturtium officinale 20%

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: 15 (in.)  
Depth to Saturated Soil: 10 (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.):

*Soils are saturated at 10 inches. Wetland hydrology criterion is satisfied.*

**09-11-13 Observations** - Saturated soil at 12 inches below surface.

# Parametrix

Data Plot #: 14A-SP1

Wetland: 14A

Project/Site: ELST Re-delineation

Date: 10/24/2007

Revisited 09-11-13

## 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	7.5YR 3/1	5YR 4/6	few, prominent	silt loam
10-16	B	10YR 5/1	10YR 4/6	common, fine, prominent	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 Peraguiic 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.):

Chroma 1 soil and 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 #: 14A-SP2  
Wetland: Upland near 14A

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

Project/Site: ELST Re-delineation Date: 10/25/2007 Revisited 09-11-13  
Applicant/Owner: King County County: King  
Investigator: Chip Maney State: WA  
☐ 1987 Method ☒ 1997 WA St. Method Community ID: Upland Forest  
Do Normal Circumstances exist on the site? Yes ☒ No ☐ Field Plot ID: 14A-SP2  
Is the site significantly disturbed (Atypical Situation)? Yes ☐ No ☒  
Is the area a potential Problem Area? Yes ☐ No ☒

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

*This data plot is located approximately 6' northeast of flag W14A-2 at the base of Oregon Ash trees.*

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Convolvulus arvensis	trace	Herb	NL
2.	Phalaris arundinacea	15	Herb	FACW
3.	Solanum dulcamara	trace	Herb	FAC+
✓ 4.	Rubus armeniacus	80	Shrub	FACU
5.	Rubus laciniatus	trace	Shrub	FACU+
✓ 6.	Fraxinus latifolia	40	Tree	FACW

#### 09-11-13 Observations

Calystegia sepium trace  
Phalaris arundinacea 15%  
Rubus armeniacus 80%  
Rubus laciniatus trace  
Fraxinus latifolia 60%

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  
☒ No Recorded Data Available

**Field Observations:**

Depth of Surface Water: none (in.)  
Depth to Free Water in Pit: none (in.)  
Depth to Saturated Soil: 15 (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 wetland hydrology are present. Wetland hydrology criterion is not satisfied.*

# Parametrix

Data Plot #: 14A-SP2  
Wetland: Upland near 14A

Project/Site: ELST Re-delineation

Date: 10/25/2007

Revisited 09-11-13

## 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.
0-17	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 Peraguiic 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.):

A 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

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



# Parametrix

Data Plot #: 14C-SP1

Wetland: 14C

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

Project/Site: ELST Re-delineation

Date: 10/25/2007

Revisited 09-11-13

Applicant/Owner: King County

County: King

Investigator: Chip Maney, Chrissy Bailey

State: WA

☐ 1987 Method

☒ 1997 WA St. Method

Community ID: PEM

Do Normal Circumstances exist on the site? Yes X No       

Field Plot ID: 14C-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 data plot is located approximately 20 feet northeast of flag W14C-4 in a bench dominated by Phalaris arundinacea.*

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Carex obnupta	trace	Herb	OBL
✓ 2.	Phalaris arundinacea	98	Herb	FACW
3.	Solanum dulcamara	trace	Herb	FAC+
4.	Rubus armeniacus	5	Shrub	FACU
5.	Alnus rubra	trace	Tree	FAC

#### 09-11-13 Observations

Scirpus microcarpus 15%  
Phalaris arundinacea 98%  
Solanum dulcamara 30%  
Rubus armeniacus 5%  
Alnus rubra (overhanging) 5%  
Fraxinus latifolia (overhanging) 20%

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: surface (in.)  
Depth to Saturated Soil: surface (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.):

*Soils were saturated to the surface. Water was filling the pit as soil was removed. Wetland hydrology criterion is satisfied.*

**09-11-13 Observations** - Saturated soil to the surface.

# Parametrix

Data Plot #: 14C-SP1

Wetland: 14C

Project/Site: ELST Re-delineation

Date: 10/25/2007

Revisited 09-11-13

## 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.
0-18	A	10YR 3/1	none	none	sandy loam
<b>09-11-13 Observations -</b>					
0-6		10YR 3/1	none	none	sandy loam
6-18		10Y 3/1	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 Peraguiic 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.):

A low chroma of 1 indicates 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 #: 14C-SP2  
Wetland: Upland near 14C

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

Project/Site: ELST Re-delineation Date: 10/25/2007 Revisited 09-11-13  
Applicant/Owner: King county County: King  
Investigator: Chip Maney, Chrissy Bailey 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: 14C-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 35 feet northeast and uphill of flag W14C-14. The location is approximately 20 feet north of a private drive crossing the trail. The data plot is located beneath a thick canopy of blackberries on a bench just west of the road.

### VEGETATION (✓ Dominant species are checked)

	Plant Species	% Cover	Stratum	Indicator
1.	Equisetum arvense	trace	Herb	FAC
2.	Phalaris arundinacea	5	Herb	FACW
✓ 3.	Rubus armeniacus	90	Shrub	FACU
✓ 4.	Alnus rubra	60	Tree	FAC
5.	Fraxinus latifolia	trace	Tree	FACW

### 09-11-13 Observations

Equisetum arvense trace  
Phalaris arundinacea 5%  
Rubus armeniacus 90%  
Alnus rubra 60%  
Fraxinus latifolia 25%

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.):

No primary or secondary indicators of hydrology are present. Wetland hydrology criterion is not satisfied.

# Parametrix

Data Plot #: 14C-SP2  
Wetland: Upland near 14C

Project/Site: ELST Re-delineation

Date: 10/25/2007

Revisited 09-11-13

## 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.
0-18	A	10YR 3/2	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 Peraguiic 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.

## WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes ☐ No ☒

Hydric Soils Present? Yes ☐ No ☒

Wetland Hydrology Present? Yes ☐ No ☒

Is this Sampling Point Within a Wetland?

Yes ☐ No ☒

### Remarks

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

## Appendix B

### Site Photographs









**Photo 1.** Wetland 3E (looking south from north end).



**Photo 2.** Wetland 12A (looking north from south end).





**Photo 3.** Wetland 13A (looking north from central portion).



**Photo 4.** Wetland 14A and Unnamed Stream #1 (looking north from south end).





**Photo 5.** Wetland 14C (looking north from south end).



**Photo 6.** South Fork Stream 0163 (looking west from trail).



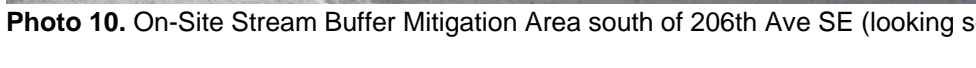
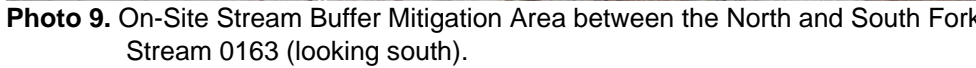


**Photo 7.** Unnamed Stream #3 (looking south from north end).



**Photo 8.** On-Site Stream Buffer Mitigation Area between the North and South Forks of Stream 0163 (looking north).









# Appendix C

## Wetland Rating Forms





Wetland name or number 3E

## 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): 3E Date of site visit: 09-11-13

Rated by: Colin Worsley / Matt Maynard Trained by Ecology? Yes X No    Date of training: 11-2005 / 04-2006

SEC: 16, 17 TWSHP: 24N RNGE: 6E Is S/T/R in Appendix D? Yes    No X

Map of wetland unit: Figure                      Estimated size                     

### SUMMARY OF RATING

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

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

Score for Water Quality Functions

4

Score for Hydrologic Functions

4

Score for Habitat Functions

11

TOTAL Score for Functions

19

Category based on SPECIAL CHARACTERISTICS of Wetland I            II            Does not apply X

**Final Category** (choose the “highest” category from above)

IV

### Summary of basic information about the wetland unit.

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

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

## 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 called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term “Estuarine” wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. \_\_\_\_).*

2. The entire wetland unit is flat and precipitation is 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.

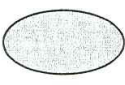
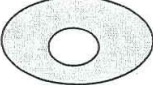


<i>HGM Classes within the wetland unit being rated</i>	<i>HGM Class to Use in Rating</i>
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
<b>Depressional + Riverine along stream within boundary</b>	<b>Depressional</b>
Depressional + Lake-fringe	Depressional
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.

D Depressional and Flat Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.38)
<b>D 1</b>	<b>Does the wetland have the <u>potential</u> to improve water quality?</b>	
D 1.1	Characteristics of surface water flows out of the wetland: <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 3</li> <li>Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 1</li> <li>Unit is a “flat” depression (Q.7 on key), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”) <b>Provide photo or drawing</b></li> </ul>	Figure ____ 2
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic ( <i>use NRCS definitions</i> ) <b>YES</b> points = 4 <b>NO</b> points = 0	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): <ul style="list-style-type: none"> <li>Wetland has persistent, ungrazed vegetation &gt; = 95% of area..... points = 5</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/2 of area..... points = 3</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/10 of area..... points = 1</li> <li>Wetland has persistent, ungrazed vegetation &lt; 1/10 of area..... points = 0</li> </ul> <b>Map of Cowardin vegetation classes</b>	Figure ____ 0
D 1.4	Characteristics of seasonal ponding or inundation: <i>This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.</i> <ul style="list-style-type: none"> <li>Area seasonally ponded is &gt; 1/2 total area of wetland ..... points = 4</li> <li>Area seasonally ponded is &gt; 1/4 total area of wetland ..... points = 2</li> <li>Area seasonally ponded is &lt; 1/4 total area of wetland ..... points = 0</li> </ul> <b>Map of Hydroperiods</b>	Figure ____ 0
<b>Total for D 1</b> <i>Add the points in the boxes above</i>		2
<b>D 2</b>	<b>Does the wetland have the <u>opportunity</u> to improve water quality?</b> 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> <ul style="list-style-type: none"> <li><input type="checkbox"/> Grazing in the wetland or within 150 ft</li> <li><input type="checkbox"/> Untreated stormwater discharges to wetland</li> <li><input type="checkbox"/> Tilled fields or orchards within 150 ft. of wetland</li> <li><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</li> <li><input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft. of wetland</li> <li><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</li> <li><input type="checkbox"/> Other _____</li> </ul> <b>YES multiplier is 2</b> <b>NO</b> multiplier is 1	(see p. 44)  Multiplier X2
◆	<b>TOTAL – Water Quality Functions</b> Multiply the score from D1 by D2; then <i>add score to table on p. 1</i>	4
HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.		
<b>D 3</b>	<b>Does the wetland have the <u>potential</u> to reduce flooding and erosion?</b>	(see p.46)
D 3.1	Characteristics of surface water flows out of the wetland unit <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 4</li> <li>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2</li> <li>Unit is a “flat” depression (Q.7 on key) or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”)</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 0</li> </ul>	2
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> <ul style="list-style-type: none"> <li>Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7</li> <li>The wetland is a “headwater” wetland..... points = 5</li> <li>Marks of ponding between 2 ft. to &lt; 3 ft. from surface or bottom of outlet..... points = 5</li> <li>Marks are at least 0.5 ft. to &lt; 2 ft. from surface or bottom of outlet..... points = 3</li> <li>Wetland is flat (yes to Q.2 or Q.7 on key)but has small depressions on the surface that trap water points = 1</li> <li>Marks of ponding less than 0.5 ft..... points = 0</li> </ul>	0
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> <ul style="list-style-type: none"> <li>The area of the basin is less than 10 times the area of unit ..... points = 5</li> <li>The area of the basin is 10 to 100 times the area of the unit ..... points = 3</li> <li>The area of the basin is more than 100 times the area of the unit..... points = 0</li> <li>Entire unit is in the FLATS class ..... points = 5</li> </ul>	0
<b>Total for D 3</b> <i>Add the points in the boxes above</i>		2

<b>D 4</b>	<p><b>Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?</b></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. <i>Note which of the following indicators of opportunity apply.</i></p> <p> <input type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems.  <input type="checkbox"/> Wetland drains to a river or stream that has flooding problems  <input type="checkbox"/> Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems  <input type="checkbox"/> Other _____         </p> <p style="text-align: center;"> <b>YES multiplier is 2</b> <b>NO multiplier is 1</b> </p>	<p>(see p. 49)</p> <p>Multiplier X2 _____</p>
◆	<p><b>TOTAL – Hydrologic Functions</b> Multiply the score from D3 by D4; then <i>add score to table on p. 1</i></p>	4

Comments:

These questions apply to wetlands of all HGM classes.		Points								
HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.		(only 1 score per box)								
<b>H 1</b>	<b>Does the wetland have the <u>potential</u> to provide habitat for many species?</b>									
H 1.1	<p><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 type="checkbox"/> Scrub/shrub (areas where shrubs have &gt; 30% cover) <input type="checkbox"/> Forested (areas where trees have &gt; 30% cover) 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. Add the number of vegetation types that qualify. If you have:</p> <table border="0"> <tr> <td>4 structures or more..... points = 4</td> <td><b>Map of Cowardin vegetation classes</b></td> </tr> <tr> <td>2 structures..... points = 1</td> <td>3 structures..... points = 2</td> </tr> <tr> <td></td> <td>1 structure..... points = 0</td> </tr> </table>	4 structures or more..... points = 4	<b>Map of Cowardin vegetation classes</b>	2 structures..... points = 1	3 structures..... points = 2		1 structure..... points = 0	Figure ____  0		
4 structures or more..... points = 4	<b>Map of Cowardin vegetation classes</b>									
2 structures..... points = 1	3 structures..... points = 2									
	1 structure..... points = 0									
H 1.2	<p><u>Hydroperiods</u> (see p.73): Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).</p> <p><input checked="" type="checkbox"/> Permanently flooded or inundated <input type="checkbox"/> Seasonally flooded or inundated <input type="checkbox"/> Occasionally flooded or inundated <input checked="" type="checkbox"/> Saturated only <input checked="" 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</p> <p><b>Map of hydroperiods</b></p> <table border="0"> <tr> <td>4 or more types present</td> <td>points = 3</td> </tr> <tr> <td>3 or more types present.....</td> <td>points = 2</td> </tr> <tr> <td>2 types present.....</td> <td>points = 1</td> </tr> <tr> <td>1 type present.....</td> <td>points = 0</td> </tr> </table>	4 or more types present	points = 3	3 or more types present.....	points = 2	2 types present.....	points = 1	1 type present.....	points = 0	Figure ____  2
4 or more types present	points = 3									
3 or more types present.....	points = 2									
2 types present.....	points = 1									
1 type present.....	points = 0									
H 1.3	<p><u>Richness of Plant Species</u> (see p. 75): Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup> (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 border="0"> <tr> <td>&gt; 19 species .....</td> <td>points = 2</td> </tr> <tr> <td>5 – 19 species.....</td> <td>points = 1</td> </tr> <tr> <td>&lt; 5 species .....</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p> <p>_____</p> <p>_____</p> <p>_____</p>	> 19 species .....	points = 2	5 – 19 species.....	points = 1	< 5 species .....	points = 0	1		
> 19 species .....	points = 2									
5 – 19 species.....	points = 1									
< 5 species .....	points = 0									
H 1.4	<p><u>Interspersion of Habitats</u> (see p. 76): Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> <div style="text-align: center;">  <p>High = 3 points</p> </div> </div> <p>[riparian braided channels]</p> <p>Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always “high”.</p> <p><b>Use map of Cowardin classes.</b></p>	Figure ____  0								
H 1.5	<p><u>Special Habitat Features</u> (see p. 77): Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in. diameter and 6 ft. long) <input type="checkbox"/> Standing snags (diameter at the bottom &gt; 4 inches) in the wetland <input type="checkbox"/> 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) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown) <input type="checkbox"/> 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) <input type="checkbox"/> 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.</p>	0								
<b>H 1 TOTAL Score – potential for providing habitat</b>		<b>3</b>								



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

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 <a href="http://wdfw.wa.gov/hab/phslist.htm">http://wdfw.wa.gov/hab/phslist.htm</a>)</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><input type="checkbox"/> <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p><input type="checkbox"/> <b>Biodiversity Areas and Corridors:</b> 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><input type="checkbox"/> <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p><input type="checkbox"/> <b>Old-growth/Mature forests:</b> (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) &gt; 81 cm (32 in) dbh or &gt; 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><input type="checkbox"/> <b>Oregon white Oak:</b> 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><input checked="" type="checkbox"/> <b>Riparian:</b> 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><input type="checkbox"/> <b>Westside Prairies:</b> 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><input checked="" type="checkbox"/> <b>Instream:</b> 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><input type="checkbox"/> <b>Nearshore:</b> 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><input type="checkbox"/> <b>Caves:</b> 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><input type="checkbox"/> <b>Cliffs:</b> Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p><input type="checkbox"/> <b>Talus:</b> 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><input type="checkbox"/> <b>Snags and Logs:</b> 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 &gt; 51 cm (20 in) in western Washington and are &gt; 2 m (6.5 ft) in height. Priority logs are &gt; 30 cm (12 in) in diameter at the largest end, and &gt; 6 m (20 ft) long.</p> <p>If wetland has <b>3 or more</b> priority habitats = <b>4 points</b>          If wetland has <b>2</b> priority habitats = <b>3 points</b>          If wetland has <b>1</b> priority habitat = <b>1 point</b>                      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>	3
	<p>H 2.4 <u>Wetland Landscape:</u> Choose the <b>one</b> description of the landscape around the wetland that best fits (see p. 84)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5</li> <li>• There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3</li> <li>• The wetland fringe on a lake <b>with</b> disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3</li> <li>• There is at least 1 wetland within 1/2 mile .....points = 2</li> <li>• There are no wetlands within 1/2 mile.....points = 0</li> </ul>	3
	<p><b>H 2 TOTAL Score – opportunity for providing habitat</b>                      Add the scores from H2.1, H2.2, H2.3, H2.4</p>	8
	<p><b>TOTAL for H 1 from page 8</b></p>	3
◆	<p><b>Total Score for Habitat Functions</b>                      Add the points for H 1 and H 2; then <b>record the result on p. 1</b></p>	11

Comments:

## CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

Wetland Type – Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.		
SC1	<b>Estuarine wetlands?</b> (see p. 86) Does the wetland unit meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt. <b>YES</b> = Go to SC 1.1 <b>NO</b> <u>X</u>	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? <b>YES</b> = Category I <b>NO</b> = go to SC 1.2	<b>Cat. 1</b>
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? <b>YES</b> = Category I <b>NO</b> = Category II <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp. are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre. <input type="checkbox"/> 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 <input type="checkbox"/> The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	<b>Cat. I</b>  <b>Cat. II</b>  <b>Dual Rating I/II</b>
SC2	<b>Natural Heritage Wetlands</b> (see p. 87) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D _____ or accessed from WNHP/DNR web site <u>X</u> <b>YES</b> _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 <b>NO</b> <u>X</u> SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? <b>YES</b> = Category 1 <b>NO</b> _____ not a Heritage Wetland	<b>Cat I</b>
SC3	<b>Bogs</b> (see p. 87) Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. <i>If you answer yes you will still need to rate the wetland based on its function.</i> 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? <b>YES</b> = go to question 3 <b>NO</b> = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? <b>YES</b> = go to question 3 <b>NO</b> = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? <b>YES</b> = Is a bog for purpose of rating <b>NO</b> = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? <b>YES</b> = Category I <b>NO</b> = Is not a bog for purpose of rating	<b>Cat. I</b>

SC4	<p><b>Forested Wetlands</b> (see p. 90)</p> <p>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>_____ <b>Old-growth forests:</b> (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>_____ <b>Mature forests:</b> (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><b>YES</b> = Category I                      <b>NO</b> = <u>  X  </u> not a forested wetland with special characteristics</p>	Cat. I
SC5	<p><b>Wetlands in Coastal Lagoons</b> (see p. 91)</p> <p>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 (&gt; 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><b>YES</b> = Go to SC 5.1                      <b>NO</b> <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><b>YES</b> = Category I                      <b>NO</b> = Category II</p>	Cat. I Cat. II
SC6	<p><b>Interdunal Wetlands</b> (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><b>YES</b> = Go to SC 6.1                      <b>NO</b> <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"> <li>• Long Beach Peninsula -- lands west of SR 103</li> <li>• Grayland-Westport -- lands west of SR 105</li> <li>• Ocean Shores-Copalis – lands west of SR 115 and SR 109</li> </ul> <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><b>YES</b> = Category II                      <b>NO</b> = 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><b>YES</b> = Category III</p>	Cat. II Cat. III
◆	<p><b>Category of wetland based on Special Characteristics</b></p> <p><i>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered <b>NO</b> for all types enter "Not Applicable" on p. 1</p>	NA

Comments:

Wetland name or number 12A

**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): 12A Date of site visit: 09-12-13

Rated by: Colin Worsley / Matt Maynard Trained by Ecology? Yes X No    Date of training: 11-2005 / 04-2006

SEC: 17 TWNSHP: 24N RNGE: 6E Is S/T/R in Appendix D? Yes    No X

Map of wetland unit: Figure                      Estimated size                     

**SUMMARY OF RATING**

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

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

Score for Water Quality Functions

12

Score for Hydrologic Functions

24

Score for Habitat Functions

11

TOTAL Score for Functions

47

Category based on SPECIAL CHARACTERISTICS of Wetland I            II            Does not apply   X  

**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	X
Natural Heritage Wetland		Riverine	
Bog		Lake-fringe	
Mature Forest		Slope	
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	

**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 <b>animal or plant</b> 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 <b>animal</b> 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.

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

## 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 called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term “Estuarine” wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. \_\_\_\_).*

2. The entire wetland unit is flat and precipitation is 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.*

<i>HGM Classes within the wetland unit being rated</i>	<i>HGM Class to Use in Rating</i>
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 <b>ESTUARINE</b> 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.



D Depressional and Flat Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.38)
<b>D 1</b>	<b>Does the wetland have the <u>potential</u> to improve water quality?</b>	
D 1.1	Characteristics of surface water flows out of the wetland: <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... <b>points = 3</b></li> <li>Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 1</li> <li>Unit is a “flat” depression (Q.7 on key), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”) <b>Provide photo or drawing</b></li> </ul>	Figure ____ 3
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic ( <i>use NRCS definitions</i> ) <b>YES</b> points = 4 <b>NO</b> points = 0	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): <ul style="list-style-type: none"> <li>Wetland has persistent, ungrazed vegetation &gt; = 95% of area..... points = 5</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/2 of area..... points = 3</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/10 of area..... <b>points = 1</b></li> <li>Wetland has persistent, ungrazed vegetation &lt; 1/10 of area..... points = 0</li> </ul> <b>Map of Cowardin vegetation classes</b>	Figure ____ 1
D 1.4	Characteristics of seasonal ponding or inundation: <i>This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.</i> <ul style="list-style-type: none"> <li>Area seasonally ponded is &gt; 1/2 total area of wetland ..... points = 4</li> <li>Area seasonally ponded is &gt; 1/4 total area of wetland ..... <b>points = 2</b></li> <li>Area seasonally ponded is &lt; 1/4 total area of wetland ..... points = 0</li> </ul> <b>Map of Hydroperiods</b>	Figure ____ 2
<b>Total for D 1</b> <i>Add the points in the boxes above</i>		<b>6</b>
<b>D 2</b>	<b>Does the wetland have the <u>opportunity</u> to improve water quality?</b> 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> <ul style="list-style-type: none"> <li><input type="checkbox"/> Grazing in the wetland or within 150 ft</li> <li><input type="checkbox"/> Untreated stormwater discharges to wetland</li> <li><input type="checkbox"/> Tilled fields or orchards within 150 ft. of wetland</li> <li><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</li> <li><input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft. of wetland</li> <li><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</li> <li><input type="checkbox"/> Other _____</li> </ul> <b>YES multiplier is 2</b> <b>NO multiplier is 1</b>	(see p. 44)  Multiplier <b>X2</b>
<b>◆ TOTAL – Water Quality Functions</b> Multiply the score from D1 by D2; then <b>add score to table on p. 1</b>		<b>12</b>
HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.		
<b>D 3</b>	<b>Does the wetland have the <u>potential</u> to reduce flooding and erosion?</b>	(see p.46)
D 3.1	Characteristics of surface water flows out of the wetland unit <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... <b>points = 4</b></li> <li>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2</li> <li>Unit is a “flat” depression (Q.7 on key) or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”)</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 0</li> </ul>	4
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> <ul style="list-style-type: none"> <li>Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7</li> <li>The wetland is a “headwater” wetland..... points = 5</li> <li>Marks of ponding between 2 ft. to &lt; 3 ft. from surface or bottom of outlet..... points = 5</li> <li>Marks are at least 0.5 ft. to &lt; 2 ft. from surface or bottom of outlet..... <b>points = 3</b></li> <li>Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water points = 1</li> <li>Marks of ponding less than 0.5 ft..... points = 0</li> </ul>	3
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> <ul style="list-style-type: none"> <li>The area of the basin is less than 10 times the area of unit ..... <b>points = 5</b></li> <li>The area of the basin is 10 to 100 times the area of the unit ..... points = 3</li> <li>The area of the basin is more than 100 times the area of the unit..... points = 0</li> <li>Entire unit is in the FLATS class ..... points = 5</li> </ul>	5
<b>Total for D 3</b> <i>Add the points in the boxes above</i>		<b>12</b>



Wetland Rating Form – Western Washington, Version 2 (7/06), updated with new WDFW definitions Oct. 2008 Page 4 of 9

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)												
<b>HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.</b>														
<b>H 1</b>	<b>Does the wetland have the <u>potential</u> to provide habitat for many species?</b>													
H 1.1	<p><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 type="checkbox"/> Emergent plants  <input type="checkbox"/> Scrub/shrub (areas where shrubs have &gt; 30% cover)  <input checked="" type="checkbox"/> Forested (areas where trees have &gt; 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 types that qualify. If you have:         </p> <table border="0"> <tr> <td>4 structures or more.....</td> <td>points = 4</td> <td><b>Map of Cowardin vegetation classes</b></td> </tr> <tr> <td>3 structures.....</td> <td>points = 2</td> <td></td> </tr> <tr> <td>2 structures.....</td> <td>points = 1</td> <td>1 structure ..... points = 0</td> </tr> </table>	4 structures or more.....	points = 4	<b>Map of Cowardin vegetation classes</b>	3 structures.....	points = 2		2 structures.....	points = 1	1 structure ..... points = 0	Figure ____  1			
4 structures or more.....	points = 4	<b>Map of Cowardin vegetation classes</b>												
3 structures.....	points = 2													
2 structures.....	points = 1	1 structure ..... points = 0												
H 1.2	<p><u>Hydroperiods</u> (see p.73): Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).</p> <p> <input type="checkbox"/> Permanently flooded or inundated  <input checked="" type="checkbox"/> Seasonally flooded or inundated  <input 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 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> <table border="0"> <tr> <td>4 or more types present</td> <td>points = 3</td> <td><b>Map of hydroperiods</b></td> </tr> <tr> <td>3 or more types present.....</td> <td>points = 2</td> <td></td> </tr> <tr> <td>2 types present.....</td> <td>points = 1</td> <td></td> </tr> <tr> <td>1 type present .....</td> <td>points = 0</td> <td></td> </tr> </table>	4 or more types present	points = 3	<b>Map of hydroperiods</b>	3 or more types present.....	points = 2		2 types present.....	points = 1		1 type present .....	points = 0		Figure ____  1
4 or more types present	points = 3	<b>Map of hydroperiods</b>												
3 or more types present.....	points = 2													
2 types present.....	points = 1													
1 type present .....	points = 0													
H 1.3	<p><u>Richness of Plant Species</u> (see p. 75): Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup> (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 border="0"> <tr> <td>&gt; 19 species .....</td> <td>points = 2</td> </tr> <tr> <td>5 – 19 species.....</td> <td>points = 1</td> </tr> <tr> <td>&lt; 5 species .....</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p> <p>_____</p> <p>_____</p> <p>_____</p>	> 19 species .....	points = 2	5 – 19 species.....	points = 1	< 5 species .....	points = 0	1						
> 19 species .....	points = 2													
5 – 19 species.....	points = 1													
< 5 species .....	points = 0													
H 1.4	<p><u>Interspersion of Habitats</u> (see p. 76): Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>None = 0 points    Low = 1 point    Moderate = 2 points</p> <p>High = 3 points    [riparian braided channels]</p> </div> <div style="flex: 1; padding-left: 20px;"> <p>Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always “high”.</p> <p><b>Use map of Cowardin classes.</b></p> </div> </div>	Figure ____  0												
H 1.5	<p><u>Special Habitat Features</u> (see p. 77): Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <p> <input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in. diameter and 6 ft. long)  <input type="checkbox"/> Standing snags (diameter at the bottom &gt; 4 inches) in the wetland  <input type="checkbox"/> 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)  <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)  <input type="checkbox"/> 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)  <input type="checkbox"/> 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.         </p>	0												
<b>H 1 TOTAL Score – potential for providing habitat</b>		<b>3</b>												

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

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 <a href="http://wdfw.wa.gov/hab/phslist.htm">http://wdfw.wa.gov/hab/phslist.htm</a>)</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>___ <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p>___ <b>Biodiversity Areas and Corridors:</b> 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>___ <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p>___ <b>Old-growth/Mature forests:</b> (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) &gt; 81 cm (32 in) dbh or &gt; 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>___ <b>Oregon white Oak:</b> 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><u>X</u> <b>Riparian:</b> 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>___ <b>Westside Prairies:</b> 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><u>X</u> <b>Instream:</b> 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>___ <b>Nearshore:</b> 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>___ <b>Caves:</b> 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>___ <b>Cliffs:</b> Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p>___ <b>Talus:</b> 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>___ <b>Snags and Logs:</b> 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 &gt; 51 cm (20 in) in western Washington and are &gt; 2 m (6.5 ft) in height. Priority logs are &gt; 30 cm (12 in) in diameter at the largest end, and &gt; 6 m (20 ft) long.</p> <p>If wetland has <b>3 or more</b> priority habitats = <b>4 points</b>  If wetland has <b>2</b> priority habitats = <b>3 points</b>  If wetland has <b>1</b> priority habitat = <b>1 point</b>      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>	3
	<p>H 2.4 <u>Wetland Landscape:</u> Choose the <b>one</b> description of the landscape around the wetland that best fits (see p. 84)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5</li> <li>• There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3</li> <li>• The wetland fringe on a lake <b>with</b> disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3</li> <li>• There is at least 1 wetland within 1/2 mile .....points = 2</li> <li>• There are no wetlands within 1/2 mile.....points = 0</li> </ul>	3
	<p><b>H 2 TOTAL Score – opportunity for providing habitat</b>      Add the scores from H2.1, H2.2, H2.3, H2.4</p>	8
	<p><b>TOTAL for H 1 from page 8</b></p>	3
◆	<p><b>Total Score for Habitat Functions</b>      Add the points for H 1 and H 2; then <b>record the result on p. 1</b></p>	11

Comments:

## CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

<b>Wetland Type</b> – Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.		
SC1	<b>Estuarine wetlands?</b> (see p.86) Does the wetland unit meet the following criteria for Estuarine wetlands? _____ The dominant water regime is tidal, _____ Vegetated, and _____ With a salinity greater than 0.5 ppt. <b>YES</b> = Go to SC 1.1 <b>NO</b> _____	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? <b>YES</b> = Category I <b>NO</b> = go to SC 1.2	<b>Cat. 1</b>
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? <b>YES</b> = Category I <b>NO</b> = Category II _____ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp., are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre. _____ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland _____ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	<b>Cat. I</b>  <b>Cat. II</b>  <b>Dual Rating I/II</b>
SC2	<b>Natural Heritage Wetlands</b> (see p. 87) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D _____ or accessed from WNHP/DNR web site _____ <b>YES</b> _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 <b>NO</b> _____ SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? <b>YES</b> = Category 1 <b>NO</b> _____ not a Heritage Wetland	<b>Cat I</b>
SC3	<b>Bogs</b> (see p. 87) Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. <i>If you answer yes you will still need to rate the wetland based on its function.</i> 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? <b>YES</b> = go to question 3 <b>NO</b> = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? <b>YES</b> = go to question 3 <b>NO</b> = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? <b>YES</b> = Is a bog for purpose of rating <b>NO</b> = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? <b>YES</b> = Category I <b>NO</b> = Is not a bog for purpose of rating	<b>Cat. I</b>

SC4	<p><b>Forested Wetlands</b> (see p. 90)</p> <p>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>_____ <b>Old-growth forests:</b> (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>_____ <b>Mature forests:</b> (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><b>YES</b> = Category I                      <b>NO</b> = _____ not a forested wetland with special characteristics</p>	Cat. I
SC5	<p><b>Wetlands in Coastal Lagoons</b> (see p. 91)</p> <p>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 (&gt; 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><b>YES</b> = Go to SC 5.1                      <b>NO</b> _____ 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><b>YES</b> = Category I                      <b>NO</b> = Category II</p>	Cat. I Cat. II
SC6	<p><b>Interdunal Wetlands</b> (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><b>YES</b> = Go to SC 6.1                      <b>NO</b> _____ 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"> <li>• Long Beach Peninsula -- lands west of SR 103</li> <li>• Grayland-Westport -- lands west of SR 105</li> <li>• Ocean Shores-Copalis – lands west of SR 115 and SR 109</li> </ul> <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><b>YES</b> = Category II                      <b>NO</b> = 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><b>YES</b> = Category III</p>	Cat. II Cat. III
◆	<p><b>Category of wetland based on Special Characteristics</b></p> <p><i>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered <b>NO</b> for all types enter "Not Applicable" on p. 1</p>	

Comments:

Wetland name or number 13A

**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): 13A Date of site visit: 09-11-13

Rated by: Colin Worsley / Matt Maynard Trained by Ecology? Yes X No    Date of training: 11-2005 / 04-2006

SEC: 17 TWNSHP: 24N RNGE: 6E Is S/T/R in Appendix D? Yes    No X

Map of wetland unit: Figure                      Estimated size                     

**SUMMARY OF RATING**

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

Category I =	Score > 70	Score for Water Quality Functions	10
Category II =	Score 51 - 69	Score for Hydrologic Functions	16
Category III =	Score 30 – 50	Score for Habitat Functions	14
Category IV =	Score < 30	TOTAL Score for Functions	40

Category based on SPECIAL CHARACTERISTICS of Wetland I            II            Does not apply   X  

**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	X
Natural Heritage Wetland		Riverine	
Bog		Lake-fringe	
Mature Forest		Slope	
Old Growth Forest		Flats	
Coastal Lagoon		Freshwater Tidal	
Interdunal			
None of the above	X	Check if unit has multiple HGM classes present	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 <b>animal or plant</b> 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 <b>animal</b> 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.

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



## 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 called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term “Estuarine” wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. \_\_\_\_).*

2. The entire wetland unit is flat and precipitation is 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.

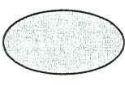
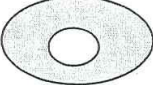


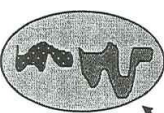

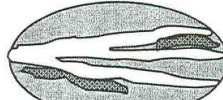
<i>HGM Classes within the wetland unit being rated</i>	<i>HGM Class to Use in Rating</i>
Slope + Riverine	Riverine
<b>Slope + Depressional</b>	<b>Depressional</b>
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
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.

D Depressional and Flat Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.38)
<b>D 1</b>	<b>Does the wetland have the <u>potential</u> to improve water quality?</b>	
D 1.1	Characteristics of surface water flows out of the wetland: <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 3</li> <li>Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 1</li> <li>Unit is a “flat” depression (Q.7 on key), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”) <b>Provide photo or drawing</b></li> </ul>	Figure ____ 2
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic ( <i>use NRCS definitions</i> ) <b>YES</b> points = 4 <b>NO</b> points = 0	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): <ul style="list-style-type: none"> <li>Wetland has persistent, ungrazed vegetation &gt; = 95% of area..... points = 5</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/2 of area..... points = 3</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/10 of area..... points = 1</li> <li>Wetland has persistent, ungrazed vegetation &lt; 1/10 of area..... points = 0</li> </ul> <b>Map of Cowardin vegetation classes</b>	Figure ____ 3
D 1.4	Characteristics of seasonal ponding or inundation: <i>This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.</i> <ul style="list-style-type: none"> <li>Area seasonally ponded is &gt; 1/2 total area of wetland ..... points = 4</li> <li>Area seasonally ponded is &gt; 1/4 total area of wetland ..... points = 2</li> <li>Area seasonally ponded is &lt; 1/4 total area of wetland ..... points = 0</li> </ul> <b>Map of Hydroperiods</b>	Figure ____ 0
<b>Total for D 1</b> <i>Add the points in the boxes above</i>		<b>5</b>
<b>D 2</b>	<b>Does the wetland have the <u>opportunity</u> to improve water quality?</b> 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> <ul style="list-style-type: none"> <li><input type="checkbox"/> Grazing in the wetland or within 150 ft</li> <li><input type="checkbox"/> Untreated stormwater discharges to wetland</li> <li><input type="checkbox"/> Tilled fields or orchards within 150 ft. of wetland</li> <li><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</li> <li><input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft. of wetland</li> <li><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</li> <li><input type="checkbox"/> Other _____</li> </ul> <b>YES multiplier is 2</b> <b>NO multiplier is 1</b>	(see p. 44)  Multiplier X2
◆	<b>TOTAL – Water Quality Functions</b> Multiply the score from D1 by D2; then <i>add score to table on p. 1</i>	10
HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.		
<b>D 3</b>	<b>Does the wetland have the <u>potential</u> to reduce flooding and erosion?</b>	(see p.46)
D 3.1	Characteristics of surface water flows out of the wetland unit <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 4</li> <li>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2</li> <li>Unit is a “flat” depression (Q.7 on key) or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”)</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 0</li> </ul>	2
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> <ul style="list-style-type: none"> <li>Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7</li> <li>The wetland is a “headwater” wetland..... points = 5</li> <li>Marks of ponding between 2 ft. to &lt; 3 ft. from surface or bottom of outlet..... points = 5</li> <li>Marks are at least 0.5 ft. to &lt; 2 ft. from surface or bottom of outlet..... points = 3</li> <li>Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water points = 1</li> <li>Marks of ponding less than 0.5 ft..... points = 0</li> </ul>	3
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> <ul style="list-style-type: none"> <li>The area of the basin is less than 10 times the area of unit ..... points = 5</li> <li>The area of the basin is 10 to 100 times the area of the unit ..... points = 3</li> <li>The area of the basin is more than 100 times the area of the unit..... points = 0</li> <li>Entire unit is in the FLATS class ..... points = 5</li> </ul>	3
<b>Total for D 3</b> <i>Add the points in the boxes above</i>		<b>8</b>

<b>D 4</b>	<p><b>Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?</b></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. <i>Note which of the following indicators of opportunity apply.</i></p> <p> <input type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems.  <input type="checkbox"/> Wetland drains to a river or stream that has flooding problems  <input type="checkbox"/> Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems  <input type="checkbox"/> Other _____         </p> <p style="text-align: center;"> <b>YES multiplier is 2</b>                      <b>NO multiplier is 1</b> </p>	<p>(see p. 49)</p>          <p>Multiplier X2</p> <p>_____</p>
◆	<p><b>TOTAL – Hydrologic Functions</b>                      Multiply the score from D3 by D4; then <i>add score to table on p. 1</i></p>	<p>16</p>

**Comments:**

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)												
<b>HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.</b>														
<b>H 1</b>	<b>Does the wetland have the <u>potential</u> to provide habitat for many species?</b>													
H 1.1	<p><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 &gt; 30% cover)  <input checked="" type="checkbox"/> Forested (areas where trees have &gt; 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 types that qualify. If you have:</p> <table border="0"> <tr> <td>4 structures or more.....</td> <td><b>points = 4</b></td> <td><b>Map of Cowardin vegetation classes</b></td> </tr> <tr> <td>3 structures.....</td> <td>points = 2</td> <td></td> </tr> <tr> <td>2 structures.....</td> <td>points = 1</td> <td></td> </tr> <tr> <td>1 structure.....</td> <td>points = 0</td> <td></td> </tr> </table>	4 structures or more.....	<b>points = 4</b>	<b>Map of Cowardin vegetation classes</b>	3 structures.....	points = 2		2 structures.....	points = 1		1 structure.....	points = 0		Figure ____  4
4 structures or more.....	<b>points = 4</b>	<b>Map of Cowardin vegetation classes</b>												
3 structures.....	points = 2													
2 structures.....	points = 1													
1 structure.....	points = 0													
H 1.2	<p><u>Hydroperiods</u> (see p.73): Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).</p> <p><input checked="" type="checkbox"/> Permanently flooded or inundated  <input type="checkbox"/> Seasonally flooded or inundated  <input 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 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> <table border="0"> <tr> <td>4 or more types present</td> <td>points = 3</td> <td rowspan="4"><b>Map of hydroperiods</b></td> </tr> <tr> <td>3 or more types present.....</td> <td>points = 2</td> </tr> <tr> <td>2 types present.....</td> <td><b>points = 1</b></td> </tr> <tr> <td>1 type present.....</td> <td>points = 0</td> </tr> </table>	4 or more types present	points = 3	<b>Map of hydroperiods</b>	3 or more types present.....	points = 2	2 types present.....	<b>points = 1</b>	1 type present.....	points = 0	Figure ____  1			
4 or more types present	points = 3	<b>Map of hydroperiods</b>												
3 or more types present.....	points = 2													
2 types present.....	<b>points = 1</b>													
1 type present.....	points = 0													
H 1.3	<p><u>Richness of Plant Species</u> (see p. 75): Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup> (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 border="0"> <tr> <td>&gt; 19 species .....</td> <td>points = 2</td> </tr> <tr> <td>5 – 19 species.....</td> <td><b>points = 1</b></td> </tr> <tr> <td>&lt; 5 species .....</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p> <hr/> <hr/> <hr/> <hr/>	> 19 species .....	points = 2	5 – 19 species.....	<b>points = 1</b>	< 5 species .....	points = 0	1						
> 19 species .....	points = 2													
5 – 19 species.....	<b>points = 1</b>													
< 5 species .....	points = 0													
H 1.4	<p><u>Interspersion of Habitats</u> (see p. 76): Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>High = 3 points</p> </div> <div style="text-align: center;">  <p>[riparian braided channels]</p> </div> </div> <p>Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always “high”.</p> <p><b>Use map of Cowardin classes.</b></p>	Figure ____  3												
H 1.5	<p><u>Special Habitat Features</u> (see p. 77): Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in. diameter and 6 ft. long)  <input type="checkbox"/> Standing snags (diameter at the bottom &gt; 4 inches) in the wetland  <input type="checkbox"/> 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)  <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)  <input type="checkbox"/> 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)  <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants</p> <p>NOTE: The 20% stated in early printings of the manual on page 78 is an error.</p>	0												
<b>H 1 TOTAL Score – potential for providing habitat</b>		<b>9</b>												

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

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 <a href="http://wdfw.wa.gov/hab/phslist.htm">http://wdfw.wa.gov/hab/phslist.htm</a>)</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>___ <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p>___ <b>Biodiversity Areas and Corridors:</b> 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>___ <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p>___ <b>Old-growth/Mature forests:</b> (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) &gt; 81 cm (32 in) dbh or &gt; 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>___ <b>Oregon white Oak:</b> 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>___ <b>Riparian:</b> 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>___ <b>Westside Prairies:</b> 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>___ <b>Instream:</b> 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>___ <b>Nearshore:</b> 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>___ <b>Caves:</b> 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>___ <b>Cliffs:</b> Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p>___ <b>Talus:</b> 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>___ <b>Snags and Logs:</b> 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 &gt; 51 cm (20 in) in western Washington and are &gt; 2 m (6.5 ft) in height. Priority logs are &gt; 30 cm (12 in) in diameter at the largest end, and &gt; 6 m (20 ft) long.</p> <p>If wetland has <b>3 or more</b> priority habitats = <b>4 points</b>  If wetland has <b>2</b> priority habitats = <b>3 points</b>  If wetland has <b>1</b> priority habitat = <b>1 point</b>      No habitats = <b>0 points</b></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 <b>one</b> description of the landscape around the wetland that best fits (see p. 84)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5</li> <li>• There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3</li> <li>• The wetland fringe on a lake <b>with</b> disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3</li> <li>• There is at least 1 wetland within 1/2 mile .....points = 2</li> <li>• There are no wetlands within 1/2 mile.....points = 0</li> </ul>	3
	<p><b>H 2 TOTAL Score – opportunity for providing habitat</b>      Add the scores from H2.1, H2.2, H2.3, H2.4</p>	5
	<p><b>TOTAL for H 1 from page 8</b></p>	9
◆	<p><b>Total Score for Habitat Functions</b>      Add the points for H 1 and H 2; then <b>record the result on p. 1</b></p>	14

Comments:



### CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

<b>Wetland Type</b> – Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.		
<b>SC1</b>	<b>Estuarine wetlands?</b> (see p. 86) Does the wetland unit meet the following criteria for Estuarine wetlands? ___ The dominant water regime is tidal, ___ Vegetated, and ___ With a salinity greater than 0.5 ppt. <div style="text-align: right;"> <b>YES</b> = Go to SC 1.1                      <b>NO</b> = <u>X</u> </div>	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? <b>YES</b> = Category I <b>NO</b> = go to SC 1.2	<b>Cat. 1</b>
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? <div style="text-align: right;"> <b>YES</b> = Category I                      <b>NO</b> = Category II         </div> <div style="margin-left: 20px;">           ___ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp., are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre.            ___ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland            ___ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.         </div>	<b>Cat. I</b>  <b>Cat. II</b>  <b>Dual Rating I/II</b>
<b>SC2</b>	<b>Natural Heritage Wetlands</b> (see p. 87) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D ___ or accessed from WNHP/DNR web site <u>X</u> <div style="text-align: right;"> <b>YES</b> ___ Contact WNHP/DNR (see p. 79) and go to SC 2.2                      <b>NO</b> = <u>X</u> </div> SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? <div style="text-align: right;"> <b>YES</b> = Category 1                      <b>NO</b> ___ not a Heritage Wetland         </div>	<b>Cat I</b>
<b>SC3</b>	<b>Bogs</b> (see p. 87) Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. <i>If you answer yes you will still need to rate the wetland based on its function.</i> 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? <b>YES</b> = go to question 3 <b>NO</b> = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? <b>YES</b> = go to question 3 <b>NO</b> = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? <div style="text-align: right;"> <b>YES</b> = Is a bog for purpose of rating                      <b>NO</b> = go to question 4         </div> NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? <div style="text-align: right;"> <b>YES</b> = Category I                      <b>NO</b> = Is not a bog for purpose of rating         </div>	<b>Cat. I</b>

SC4	<p><b>Forested Wetlands</b> (see p. 90)</p> <p>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>_____ <b>Old-growth forests:</b> (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>_____ <b>Mature forests:</b> (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><b>YES</b> = Category I                      <b>NO</b> = <u>  X  </u> not a forested wetland with special characteristics</p>	Cat. I
SC5	<p><b>Wetlands in Coastal Lagoons</b> (see p. 91)</p> <p>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 (&gt; 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><b>YES</b> = Go to SC 5.1                      <b>NO</b> <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><b>YES</b> = Category I                      <b>NO</b> = Category II</p>	Cat. I Cat. II
SC6	<p><b>Interdunal Wetlands</b> (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><b>YES</b> = Go to SC 6.1                      <b>NO</b> <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"> <li>• Long Beach Peninsula -- lands west of SR 103</li> <li>• Grayland-Westport -- lands west of SR 105</li> <li>• Ocean Shores-Copalis – lands west of SR 115 and SR 109</li> </ul> <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><b>YES</b> = Category II                      <b>NO</b> = 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><b>YES</b> = Category III</p>	Cat. II Cat. III
◆	<p><b>Category of wetland based on Special Characteristics</b></p> <p><i>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered <b>NO</b> for all types enter "Not Applicable" on p. 1</p>	NA

Comments:

Wetland name or number 14A

**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): 14A Date of site visit: 09-11-13

Rated by: Colin Worsley / Matt Maynard Trained by Ecology? Yes X No    Date of training: 11-2005 / 04-2006

SEC: 17 TWNSHP: 24N RNGE: 6E Is S/T/R in Appendix D? Yes    No X

Map of wetland unit: Figure                      Estimated size                     

**SUMMARY OF RATING**

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

Category I =	Score > 70	Score for Water Quality Functions	4
Category II =	Score 51 - 69	Score for Hydrologic Functions	10
Category III =	Score 30 – 50	Score for Habitat Functions	9
Category IV =	Score < 30	TOTAL Score for Functions	23

Category based on SPECIAL CHARACTERISTICS of Wetland I            II            Does not apply X

**Final Category** (choose the “highest” category from above)

IV

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

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

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

## 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 called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term “Estuarine” wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. \_\_\_\_\_).*

2. The entire wetland unit is flat and precipitation is 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.

<i>HGM Classes within the wetland unit being rated</i>	<i>HGM Class to Use in Rating</i>
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
<b>Depressional + Riverine along stream within boundary</b>	<b>Depressional</b>
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.

D Depressional and Flat Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.38)
<b>D 1</b>	<b>Does the wetland have the <u>potential</u> to improve water quality?</b>	
D 1.1	Characteristics of surface water flows out of the wetland: <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 3</li> <li>Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 1</li> <li>Unit is a “flat” depression (Q.7 on key), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”) <b>Provide photo or drawing</b></li> </ul>	Figure ____ 2
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic ( <i>use NRCS definitions</i> ) <b>YES</b> points = 4 <b>NO</b> points = 0	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): <ul style="list-style-type: none"> <li>Wetland has persistent, ungrazed vegetation &gt; = 95% of area..... points = 5</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/2 of area..... points = 3</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/10 of area..... points = 1</li> <li>Wetland has persistent, ungrazed vegetation &lt; 1/10 of area..... points = 0</li> </ul> <b>Map of Cowardin vegetation classes</b>	Figure ____ 0
D 1.4	Characteristics of seasonal ponding or inundation: <i>This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.</i> <ul style="list-style-type: none"> <li>Area seasonally ponded is &gt; 1/2 total area of wetland ..... points = 4</li> <li>Area seasonally ponded is &gt; 1/4 total area of wetland ..... points = 2</li> <li>Area seasonally ponded is &lt; 1/4 total area of wetland ..... points = 0</li> </ul> <b>Map of Hydroperiods</b>	Figure ____ 0
<b>Total for D 1</b> <i>Add the points in the boxes above</i>		2
<b>D 2</b>	<b>Does the wetland have the <u>opportunity</u> to improve water quality?</b> 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> <ul style="list-style-type: none"> <li>____ Grazing in the wetland or within 150 ft</li> <li>____ Untreated stormwater discharges to wetland</li> <li>____ Tilled fields or orchards within 150 ft. of wetland</li> <li>____ A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</li> <li><u>X</u> Residential, urban areas, golf courses are within 150 ft. of wetland</li> <li>____ Wetland is fed by groundwater high in phosphorus or nitrogen</li> <li>____ Other _____</li> </ul> <b>YES multiplier is 2</b> <b>NO multiplier is 1</b>	(see p. 44)  Multiplier X2
◆	<b>TOTAL – Water Quality Functions</b> Multiply the score from D1 by D2; then <i>add score to table on p. 1</i>	4
HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.		
<b>D 3</b>	<b>Does the wetland have the <u>potential</u> to reduce flooding and erosion?</b>	(see p.46)
D 3.1	Characteristics of surface water flows out of the wetland unit <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 4</li> <li>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2</li> <li>Unit is a “flat” depression (Q.7 on key) or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”)</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 0</li> </ul>	2
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> <ul style="list-style-type: none"> <li>Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7</li> <li>The wetland is a “headwater” wetland..... points = 5</li> <li>Marks of ponding between 2 ft. to &lt; 3 ft. from surface or bottom of outlet..... points = 5</li> <li>Marks are at least 0.5 ft. to &lt; 2 ft. from surface or bottom of outlet..... points = 3</li> <li>Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water points = 1</li> <li>Marks of ponding less than 0.5 ft..... points = 0</li> </ul>	0
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> <ul style="list-style-type: none"> <li>The area of the basin is less than 10 times the area of unit ..... points = 5</li> <li>The area of the basin is 10 to 100 times the area of the unit ..... points = 3</li> <li>The area of the basin is more than 100 times the area of the unit..... points = 0</li> <li>Entire unit is in the FLATS class ..... points = 5</li> </ul>	3
<b>Total for D 3</b> <i>Add the points in the boxes above</i>		5

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These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)									
<b>HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.</b>											
<b>H 1</b>	<b>Does the wetland have the <u>potential</u> to provide habitat for many species?</b>										
H 1.1	<p><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 type="checkbox"/> Emergent plants  <input type="checkbox"/> Scrub/shrub (areas where shrubs have &gt; 30% cover)  <input checked="" type="checkbox"/> Forested (areas where trees have &gt; 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 types that qualify. If you have:         </p> <table border="0"> <tr> <td>4 structures or more.....</td> <td>points = 4</td> <td><b>Map of Cowardin vegetation classes</b></td> </tr> <tr> <td>3 structures.....</td> <td>points = 2</td> <td></td> </tr> <tr> <td>2 structures.....</td> <td>points = 1</td> <td>1 structure ..... <b>points = 0</b></td> </tr> </table>	4 structures or more.....	points = 4	<b>Map of Cowardin vegetation classes</b>	3 structures.....	points = 2		2 structures.....	points = 1	1 structure ..... <b>points = 0</b>	Figure ____  0
4 structures or more.....	points = 4	<b>Map of Cowardin vegetation classes</b>									
3 structures.....	points = 2										
2 structures.....	points = 1	1 structure ..... <b>points = 0</b>									
H 1.2	<p><u>Hydroperiods</u> (see p.73): Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).</p> <p> <input checked="" type="checkbox"/> Permanently flooded or inundated  <input type="checkbox"/> Seasonally flooded or inundated  <input 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 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> <p>           4 or more types present points = 3            3 or more types present..... points = 2            2 types present..... <b>points = 1</b>            1 type present ..... points = 0         </p> <p style="text-align: right;"><b>Map of hydroperiods</b></p>	Figure ____  1									
H 1.3	<p><u>Richness of Plant Species</u> (see p. 75): Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup> (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 border="0"> <tr> <td>&gt; 19 species .....</td> <td>points = 2</td> </tr> <tr> <td>5 – 19 species.....</td> <td>points = 1</td> </tr> <tr> <td>&lt; 5 species .....</td> <td><b>points = 0</b></td> </tr> </table> <p>List species below if you want to:</p> <p>_____</p> <p>_____</p> <p>_____</p>	> 19 species .....	points = 2	5 – 19 species.....	points = 1	< 5 species .....	<b>points = 0</b>	0			
> 19 species .....	points = 2										
5 – 19 species.....	points = 1										
< 5 species .....	<b>points = 0</b>										
H 1.4	<p><u>Interspersion of Habitats</u> (see p. 76): Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>None = 0 points    Low = 1 point    Moderate = 2 points    High = 3 points</p> <p>[riparian braided channels]</p> </div> <div style="flex: 1; padding-left: 20px;"> <p>Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always “high”.</p> <p><b>Use map of Cowardin classes.</b></p> </div> </div>	Figure ____  0									
H 1.5	<p><u>Special Habitat Features</u> (see p. 77): Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <p> <input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in. diameter and 6 ft. long)  <input type="checkbox"/> Standing snags (diameter at the bottom &gt; 4 inches) in the wetland  <input type="checkbox"/> 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)  <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown)  <input type="checkbox"/> 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)  <input type="checkbox"/> 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.         </p>	0									
<b>H 1 TOTAL Score – potential for providing habitat</b>		Add the points in the column above <b>1</b>									

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

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 <a href="http://wdfw.wa.gov/hab/phslist.htm">http://wdfw.wa.gov/hab/phslist.htm</a>)</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>___ <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p>___ <b>Biodiversity Areas and Corridors:</b> 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>___ <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p>___ <b>Old-growth/Mature forests:</b> (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) &gt; 81 cm (32 in) dbh or &gt; 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>___ <b>Oregon white Oak:</b> 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><u>X</u> <b>Riparian:</b> 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>___ <b>Westside Prairies:</b> 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><u>X</u> <b>Instream:</b> 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>___ <b>Nearshore:</b> 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>___ <b>Caves:</b> 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>___ <b>Cliffs:</b> Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p>___ <b>Talus:</b> 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>___ <b>Snags and Logs:</b> 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 &gt; 51 cm (20 in) in western Washington and are &gt; 2 m (6.5 ft) in height. Priority logs are &gt; 30 cm (12 in) in diameter at the largest end, and &gt; 6 m (20 ft) long.</p> <p>If wetland has <b>3 or more</b> priority habitats = <b>4 points</b>  If wetland has <b>2</b> priority habitats = <b>3 points</b>  If wetland has <b>1</b> priority habitat = <b>1 point</b>                      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>	3
	<p>H 2.4 <u>Wetland Landscape:</u> Choose the <b>one</b> description of the landscape around the wetland that best fits (see p. 84)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5</li> <li>• There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3</li> <li>• The wetland fringe on a lake <b>with</b> disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3</li> <li>• There is at least 1 wetland within 1/2 mile .....points = 2</li> <li>• There are no wetlands within 1/2 mile.....points = 0</li> </ul>	3
	<p><b>H 2 TOTAL Score – opportunity for providing habitat</b>                      Add the scores from H2.1, H2.2, H2.3, H2.4</p>	8
	<p><b>TOTAL for H 1 from page 8</b></p>	1
◆	<p><b>Total Score for Habitat Functions</b>                      Add the points for H 1 and H 2; then <b>record the result on p. 1</b></p>	9

Comments:

### CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

<b>Wetland Type</b> – Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.		
<b>SC1</b>	<b>Estuarine wetlands?</b> (see p. 86) Does the wetland unit meet the following criteria for Estuarine wetlands? ___ The dominant water regime is tidal, ___ Vegetated, and ___ With a salinity greater than 0.5 ppt. <div style="text-align: right;"> <b>YES</b> = Go to SC 1.1                      <b>NO</b> = _____         </div>	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? <b>YES</b> = Category I <b>NO</b> = go to SC 1.2	<b>Cat. 1</b>
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? <div style="text-align: right;"> <b>YES</b> = Category I                      <b>NO</b> = Category II         </div> ___ The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp., are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre. ___ At least 3/4 of the landward edge of the wetland has a 100 ft. buffer of shrub, forest, or un-grazed or un-mowed grassland ___ The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	<b>Cat. I</b>  <b>Cat. II</b>  <b>Dual Rating I/II</b>
<b>SC2</b>	<b>Natural Heritage Wetlands</b> (see p. 87) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D _____ or accessed from WNHP/DNR web site _____ <div style="text-align: right;"> <b>YES</b> _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2                      <b>NO</b> _____         </div> SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? <div style="text-align: right;"> <b>YES</b> = Category 1                      <b>NO</b> _____ not a Heritage Wetland         </div>	<b>Cat I</b>
<b>SC3</b>	<b>Bogs</b> (see p. 87) Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. <i>If you answer yes you will still need to rate the wetland based on its function.</i> 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? <b>YES</b> = go to question 3 <b>NO</b> = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? <b>YES</b> = go to question 3 <b>NO</b> = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? <div style="text-align: right;"> <b>YES</b> = Is a bog for purpose of rating                      <b>NO</b> = go to question 4         </div> NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? <div style="text-align: right;"> <b>YES</b> = Category I                      <b>NO</b> = Is not a bog for purpose of rating         </div>	<b>Cat. I</b>

SC4	<p><b>Forested Wetlands</b> (see p. 90)</p> <p>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>_____ <b>Old-growth forests:</b> (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>_____ <b>Mature forests:</b> (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><b>YES</b> = Category I                      <b>NO</b> = _____ not a forested wetland with special characteristics</p>	Cat. I
SC5	<p><b>Wetlands in Coastal Lagoons</b> (see p. 91)</p> <p>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 (&gt; 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><b>YES</b> = Go to SC 5.1                      <b>NO</b> _____ 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><b>YES</b> = Category I                      <b>NO</b> = Category II</p>	Cat. I Cat. II
SC6	<p><b>Interdunal Wetlands</b> (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><b>YES</b> = Go to SC 6.1                      <b>NO</b> _____ 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"> <li>• Long Beach Peninsula -- lands west of SR 103</li> <li>• Grayland-Westport -- lands west of SR 105</li> <li>• Ocean Shores-Copalis – lands west of SR 115 and SR 109</li> </ul> <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><b>YES</b> = Category II                      <b>NO</b> = 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><b>YES</b> = Category III</p>	Cat. II Cat. III
◆	<p><b>Category of wetland based on Special Characteristics</b></p> <p>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</p> <p>If you answered <b>NO</b> for all types enter "Not Applicable" on p. 1</p>	

Comments:

Wetland name or number 14C

## 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): 14C Date of site visit: 09-11-13

Rated by: Colin Worsley / Matt Maynard Trained by Ecology? Yes X No    Date of training: 11-2005 / 04-2006

SEC: 17 TWNSHP: 24N RNGE: 6E Is S/T/R in Appendix D? Yes    No X

Map of wetland unit: Figure                      Estimated size                     

### SUMMARY OF RATING

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

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

Score for Water Quality Functions

6

Score for Hydrologic Functions

10

Score for Habitat Functions

11

TOTAL Score for Functions

27

Category based on SPECIAL CHARACTERISTICS of Wetland I            II            Does not apply X

**Final Category** (choose the “highest” category from above)

IV

### Summary of basic information about the wetland unit.

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

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



## 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 called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term “Estuarine” wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. \_\_\_\_\_).*

2. The entire wetland unit is flat and precipitation is 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.

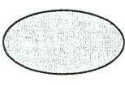
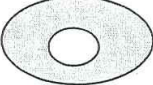

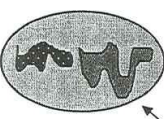

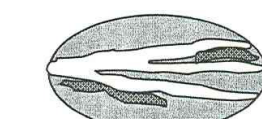
<i>HGM Classes within the wetland unit being rated</i>	<i>HGM Class to Use in Rating</i>
Slope + Riverine	Riverine
<b>Slope + Depressional</b>	<b>Depressional</b>
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
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.

D Depressional and Flat Wetlands		Points
WATER QUALITY FUNCTIONS – Indicators that wetland functions to improve water quality.		(only 1 score per box) (see p.38)
<b>D 1</b>	<b>Does the wetland have the <u>potential</u> to improve water quality?</b>	
D 1.1	Characteristics of surface water flows out of the wetland: <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 3</li> <li>Unit has an intermittently flowing, OR highly constricted, permanently flowing outlet ..... points = 2</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 1</li> <li>Unit is a “flat” depression (Q.7 on key), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”) <b>Provide photo or drawing</b></li> </ul>	Figure ____ 2
D 1.2	The soil 2 inches below the surface (or duff layer) is clay or organic ( <i>use NRCS definitions</i> ) <b>YES</b> points = 4 <b>NO</b> points = 0	0
D 1.3	Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): <ul style="list-style-type: none"> <li>Wetland has persistent, ungrazed vegetation &gt; = 95% of area..... points = 5</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/2 of area..... points = 3</li> <li>Wetland has persistent, ungrazed vegetation &gt; = 1/10 of area..... points = 1</li> <li>Wetland has persistent, ungrazed vegetation &lt; 1/10 of area..... points = 0</li> </ul> <b>Map of Cowardin vegetation classes</b>	Figure ____ 1
D 1.4	Characteristics of seasonal ponding or inundation: <i>This is the area of the wetland that is ponded for at least 2 months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition 5 out of 10 years.</i> <ul style="list-style-type: none"> <li>Area seasonally ponded is &gt; 1/2 total area of wetland ..... points = 4</li> <li>Area seasonally ponded is &gt; 1/4 total area of wetland ..... points = 2</li> <li>Area seasonally ponded is &lt; 1/4 total area of wetland ..... points = 0</li> </ul> <b>Map of Hydroperiods</b>	Figure ____ 0
<b>Total for D 1</b> <i>Add the points in the boxes above</i>		3
<b>D 2</b>	<b>Does the wetland have the <u>opportunity</u> to improve water quality?</b> 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> <ul style="list-style-type: none"> <li><input type="checkbox"/> Grazing in the wetland or within 150 ft</li> <li><input type="checkbox"/> Untreated stormwater discharges to wetland</li> <li><input type="checkbox"/> Tilled fields or orchards within 150 ft. of wetland</li> <li><input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging</li> <li><input checked="" type="checkbox"/> Residential, urban areas, golf courses are within 150 ft. of wetland</li> <li><input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen</li> <li><input type="checkbox"/> Other _____</li> </ul> <b>YES multiplier is 2</b> <b>NO</b> multiplier is 1	(see p. 44)  Multiplier X2
◆	<b>TOTAL – Water Quality Functions</b> Multiply the score from D1 by D2; then <i>add score to table on p. 1</i>	6
HYDROLOGIC FUNCTIONS – Indicators that wetland unit functions to reduce flooding and stream degradation.		
<b>D 3</b>	<b>Does the wetland have the <u>potential</u> to reduce flooding and erosion?</b>	(see p.46)
D 3.1	Characteristics of surface water flows out of the wetland unit <ul style="list-style-type: none"> <li>Unit is a depression with no surface water leaving it (no outlet)..... points = 4</li> <li>Unit has an intermittently flowing, OR highly constricted permanently flowing outlet ..... points = 2</li> <li>Unit is a “flat” depression (Q.7 on key) or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch..... points = 1 (If ditch is not permanently flowing treat unit as “intermittently flowing”)</li> <li>Unit has an unconstricted, or slightly constricted, surface outlet (<i>permanently flowing</i>) ..... points = 0</li> </ul>	2
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> <ul style="list-style-type: none"> <li>Marks of ponding are 3 ft. or more above the surface or bottom of the outlet ..... points = 7</li> <li>The wetland is a “headwater” wetland..... points = 5</li> <li>Marks of ponding between 2 ft. to &lt; 3 ft. from surface or bottom of outlet..... points = 5</li> <li>Marks are at least 0.5 ft. to &lt; 2 ft. from surface or bottom of outlet..... points = 3</li> <li>Wetland is flat (yes to Q.2 or Q.7 on key) but has small depressions on the surface that trap water ..... points = 1</li> <li>Marks of ponding less than 0.5 ft..... points = 0</li> </ul>	0
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> <ul style="list-style-type: none"> <li>The area of the basin is less than 10 times the area of unit ..... points = 5</li> <li>The area of the basin is 10 to 100 times the area of the unit ..... points = 3</li> <li>The area of the basin is more than 100 times the area of the unit..... points = 0</li> <li>Entire unit is in the FLATS class ..... points = 5</li> </ul>	3
<b>Total for D 3</b> <i>Add the points in the boxes above</i>		5

<b>D 4</b>	<p><b>Does the wetland have the <u>opportunity</u> to reduce flooding and erosion?</b></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. <i>Note which of the following indicators of opportunity apply.</i></p> <p> <input type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems.  <input type="checkbox"/> Wetland drains to a river or stream that has flooding problems  <input type="checkbox"/> Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems  <input type="checkbox"/> Other _____         </p> <p style="text-align: center;"> <b>YES multiplier is 2</b> <b>NO multiplier is 1</b> </p>	<p>(see p. 49)</p> <p>Multiplier X2 _____</p>
◆	<p><b>TOTAL – Hydrologic Functions</b> Multiply the score from D3 by D4; then <i>add score to table on p. 1</i></p>	10

Comments:

These questions apply to wetlands of all HGM classes.		Points (only 1 score per box)								
<b>HABITAT FUNCTIONS – Indicators that wetland functions to provide important habitat.</b>										
<b>H 1</b>	<b>Does the wetland have the <u>potential</u> to provide habitat for many species?</b>									
H 1.1	<p><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 type="checkbox"/> Scrub/shrub (areas where shrubs have &gt; 30% cover) <input type="checkbox"/> Forested (areas where trees have &gt; 30% cover) 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. Add the number of vegetation types that qualify. If you have:</p> <table border="0"> <tr> <td>4 structures or more..... points = 4</td> <td><b>Map of Cowardin vegetation classes</b></td> </tr> <tr> <td>2 structures..... points = 1</td> <td>3 structures..... points = 2</td> </tr> <tr> <td></td> <td>1 structure..... points = 0</td> </tr> </table>	4 structures or more..... points = 4	<b>Map of Cowardin vegetation classes</b>	2 structures..... points = 1	3 structures..... points = 2		1 structure..... points = 0	Figure ____  0		
4 structures or more..... points = 4	<b>Map of Cowardin vegetation classes</b>									
2 structures..... points = 1	3 structures..... points = 2									
	1 structure..... points = 0									
H 1.2	<p><u>Hydroperiods</u> (see p.73): Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count (see text for descriptions of hydroperiods).</p> <p><input checked="" type="checkbox"/> Permanently flooded or inundated <input checked="" type="checkbox"/> Seasonally flooded or inundated <input 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 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> <table border="0"> <tr> <td>4 or more types present</td> <td>points = 3</td> </tr> <tr> <td>3 or more types present.....</td> <td>points = 2</td> </tr> <tr> <td>2 types present.....</td> <td>points = 1</td> </tr> <tr> <td>1 type present.....</td> <td>points = 0</td> </tr> </table> <p style="text-align: right;"><b>Map of hydroperiods</b></p>	4 or more types present	points = 3	3 or more types present.....	points = 2	2 types present.....	points = 1	1 type present.....	points = 0	Figure ____  2
4 or more types present	points = 3									
3 or more types present.....	points = 2									
2 types present.....	points = 1									
1 type present.....	points = 0									
H 1.3	<p><u>Richness of Plant Species</u> (see p. 75): Count the number of plant species in the wetland that cover at least 10 ft<sup>2</sup> (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 border="0"> <tr> <td>&gt; 19 species .....</td> <td>points = 2</td> </tr> <tr> <td>5 – 19 species.....</td> <td>points = 1</td> </tr> <tr> <td>&lt; 5 species .....</td> <td>points = 0</td> </tr> </table> <p>List species below if you want to:</p> <p>_____</p> <p>_____</p> <p>_____</p>	> 19 species .....	points = 2	5 – 19 species.....	points = 1	< 5 species .....	points = 0	1		
> 19 species .....	points = 2									
5 – 19 species.....	points = 1									
< 5 species .....	points = 0									
H 1.4	<p><u>Interspersion of Habitats</u> (see p. 76): Decided from the diagrams below whether interspersion between Cowardin vegetation (described in H1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>None = 0 points</p> </div> <div style="text-align: center;">  <p>Low = 1 point</p> </div> <div style="text-align: center;">  <p>Moderate = 2 points</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p>High = 3 points</p> </div> <div style="text-align: center;">  <p>[riparian braided channels]</p> </div> </div> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Note: If you have 4 or more classes or 3 vegetation classes and open water, the rating is always “high”.</p> <p><b>Use map of Cowardin classes.</b></p> </div>	Figure ____  0								
H 1.5	<p><u>Special Habitat Features</u> (see p. 77): Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.</p> <p><input type="checkbox"/> Large, downed, woody debris within the wetland (&gt; 4 in. diameter and 6 ft. long) <input type="checkbox"/> Standing snags (diameter at the bottom &gt; 4 inches) in the wetland <input type="checkbox"/> 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) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt; 30 degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned grey/brown) <input type="checkbox"/> 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) <input type="checkbox"/> 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.</p>	0								
<b>H 1 TOTAL Score – potential for providing habitat</b>		<b>3</b>								

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

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 <a href="http://wdfw.wa.gov/hab/phslist.htm">http://wdfw.wa.gov/hab/phslist.htm</a>)</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>___ <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</p> <p>___ <b>Biodiversity Areas and Corridors:</b> 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>___ <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p>___ <b>Old-growth/Mature forests:</b> (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) &gt; 81 cm (32 in) dbh or &gt; 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>___ <b>Oregon white Oak:</b> 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>_X_ <b>Riparian:</b> 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>___ <b>Westside Prairies:</b> 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>_X_ <b>Instream:</b> 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>___ <b>Nearshore:</b> 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>___ <b>Caves:</b> 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>___ <b>Cliffs:</b> Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</p> <p>___ <b>Talus:</b> 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>___ <b>Snags and Logs:</b> 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 &gt; 51 cm (20 in) in western Washington and are &gt; 2 m (6.5 ft) in height. Priority logs are &gt; 30 cm (12 in) in diameter at the largest end, and &gt; 6 m (20 ft) long.</p> <p>If wetland has <b>3 or more</b> priority habitats = <b>4 points</b>          If wetland has <b>2</b> priority habitats = <b>3 points</b>          If wetland has <b>1</b> priority habitat = <b>1 point</b>                      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>	3
	<p>H 2.4 <u>Wetland Landscape:</u> Choose the <b>one</b> description of the landscape around the wetland that best fits (see p. 84)</p> <ul style="list-style-type: none"> <li>• 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</li> <li>• The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 5</li> <li>• There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. ....points = 3</li> <li>• The wetland fringe on a lake <b>with</b> disturbance and there are 3 other lake-fringe wetlands within 1/2 mile .....points = 3</li> <li>• There is at least 1 wetland within 1/2 mile .....points = 2</li> <li>• There are no wetlands within 1/2 mile.....points = 0</li> </ul>	3
	<p><b>H 2 TOTAL Score – opportunity for providing habitat</b>                      Add the scores from H2.1, H2.2, H2.3, H2.4</p>	8
	<p><b>TOTAL for H 1 from page 8</b></p>	3
◆	<p><b>Total Score for Habitat Functions</b>                      Add the points for H 1 and H 2; then <b>record the result on p. 1</b></p>	11

Comments:



## CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

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

Wetland Type – Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.		
SC1	<b>Estuarine wetlands?</b> (see p.86) Does the wetland unit meet the following criteria for Estuarine wetlands? <input type="checkbox"/> The dominant water regime is tidal, <input type="checkbox"/> Vegetated, and <input type="checkbox"/> With a salinity greater than 0.5 ppt. <b>YES</b> = Go to SC 1.1 <b>NO</b> <u>X</u>	
	SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? <b>YES</b> = Category I <b>NO</b> = go to SC 1.2	<b>Cat. 1</b>
	SC 1.2 Is the wetland at least 1 acre in size and meets at least two of the following conditions? <b>YES</b> = Category I <b>NO</b> = Category II <input type="checkbox"/> The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp., are only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (I/II). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre. <input type="checkbox"/> 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 <input type="checkbox"/> The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.	<b>Cat. I</b>  <b>Cat. II</b>  <b>Dual Rating I/II</b>
SC2	<b>Natural Heritage Wetlands</b> (see p. 87) Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species. SC 2.1 Is the wetland being rated in a Section/Township/Range that contains a natural heritage wetland? (This question is used to screen out most sites before you need to contact WNHP/DNR.) S/T/R information from Appendix D _____ or accessed from WNHP/DNR web site <u>X</u> <b>YES</b> _____ Contact WNHP/DNR (see p. 79) and go to SC 2.2 <b>NO</b> <u>X</u> SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? <b>YES</b> = Category 1 <b>NO</b> _____ not a Heritage Wetland	<b>Cat I</b>
SC3	<b>Bogs</b> (see p. 87) Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. <i>If you answer yes you will still need to rate the wetland based on its function.</i> 1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of soil profile? (See Appendix B for a field key to identify organic soils)? <b>YES</b> = go to question 3 <b>NO</b> = go to question 2 2. Does the wetland have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? <b>YES</b> = go to question 3 <b>NO</b> = is not a bog for purpose of rating 3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the “bog” species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? <b>YES</b> = Is a bog for purpose of rating <b>NO</b> = go to question 4 NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16” deep. If the pH is less than 5.0 and the “bog” plant species in Table 3 are present, the wetland is a bog. 4. Is the unit forested (> 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann’s spruce, or western white pine. WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (> 30% coverage of the total shrub/herbaceous cover)? <b>YES</b> = Category I <b>NO</b> = Is not a bog for purpose of rating	<b>Cat. I</b>

SC4	<p><b>Forested Wetlands</b> (see p. 90)</p> <p>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>_____ <b>Old-growth forests:</b> (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>_____ <b>Mature forests:</b> (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><b>YES</b> = Category I                      <b>NO</b> = <u>  X  </u> not a forested wetland with special characteristics</p>	Cat. I
SC5	<p><b>Wetlands in Coastal Lagoons</b> (see p. 91)</p> <p>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 (&gt; 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><b>YES</b> = Go to SC 5.1                      <b>NO</b> <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><b>YES</b> = Category I                      <b>NO</b> = Category II</p>	Cat. I Cat. II
SC6	<p><b>Interdunal Wetlands</b> (see p. 93)</p> <p>Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?</p> <p><b>YES</b> = Go to SC 6.1                      <b>NO</b> <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"> <li>• Long Beach Peninsula -- lands west of SR 103</li> <li>• Grayland-Westport -- lands west of SR 105</li> <li>• Ocean Shores-Copalis – lands west of SR 115 and SR 109</li> </ul> <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><b>YES</b> = Category II                      <b>NO</b> = 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><b>YES</b> = Category III</p>	Cat. II Cat. III
◆	<p><b>Category of wetland based on Special Characteristics</b></p> <p><i>Choose the "highest" rating if wetland falls into several categories, and record on p. 1.</i></p> <p>If you answered <b>NO</b> for all types enter "Not Applicable" on p. 1</p>	NA

Comments:



## Appendix D

### Wetland Functions and Values Forms





# Wetland Functions & Values Form

Wetland I.D. 3E

Project: ELST Re-delineation

Assessed by: Erik Christensen

Cowardin Class: PEM

Ecology Category: IV

Local Rating: IV

Wetland size: 0.07 acre

Date: 10/24/07 (rev: 09/11/13)

Function/Value	Occurrence Y N		Rationale	Principal Function(s)	Comments
Flood Flow Alteration	<b>X</b>		Wetland is depressional with a constricted outlet and is adjacent to Many Springs Creek.		Rating=Moderate Qualifiers: (4, 6)
Sediment Removal	<b>X</b>		Wetland is permanently inundated and is densely vegetated with herbaceous vegetation. Construction occurred within the last 5 years upslope of the wetland across East Lake Sammamish Parkway.		Rating=Moderate Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	<b>X</b>		Wetland is permanently inundated and is densely vegetated with herbaceous vegetation.		Rating=Moderate Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization	<b>X</b>		Wetland is associated with Many Springs Creek and is densely vegetated with herbaceous vegetation. No woody vegetation in wetland.		Rating=Low Qualifiers: (1, 3)
Production of Organic Matter and its Export	<b>X</b>		Wetland is densely covered with herbaceous vegetation and is able to export organic matter via Many Springs Creek.		Rating=Moderate Qualifiers: (1, 5, 6)
General Habitat Suitability		<b>X</b>	Wetland has one Cowardin class and is surrounded by roads and residential development.		
Habitat for Aquatic Invertebrates	<b>X</b>		Wetland is densely vegetated with herbaceous vegetation and is permanently inundated. Many Springs Creek flows through the wetland.		Rating=Moderate Qualifiers: (1, 4, 6)
Habitat for Amphibians	<b>X</b>		Wetland is densely vegetated with herbaceous vegetation and is permanently inundated. A Many Springs Creek flows through the wetland.		Rating=Moderate Qualifiers: (1, 4, 6)
Habitat for Wetland-Associated Mammals		<b>X</b>	No permanent inundation in the wetland.		
Habitat for Wetland-Associated Birds		<b>X</b>	No open water component in the wetland.		
General Fish Habitat	<b>X</b>		Wetland is associated with Many Springs Creek, that flows to Lake Sammamish, and is densely vegetated with herbaceous vegetation.		Rating=Low Qualifiers: (1, 2, 4)
Native Plant Richness	<b>X</b>		Some of dominant vegetation is native.		Rating=Low Qualifiers: (1)
Educational or Scientific Value		<b>X</b>	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		<b>X</b>	No documented protected species or habitat; not determined significant by local jurisdiction.		



## Wetland Functions & Values Form

Wetland I.D. 12A Project: ELST Re-delineation Assessed by: M. Maynard

Cowardin Class: PFO Ecology Category: III Local Rating: III Wetland size: 0.06 acre Date: 10/30/07 (rev: 09/12/13)

Function/Value	Occurrence Y N		Rationale	Principal Function(s)	Comments
Flood Flow Alteration	<b>X</b>		Wetland has some capacity for water detention.		Rating=Low Qualifiers: (4)
Sediment Removal	<b>X</b>		This function is limited by lack of sources. Wetland has dense herbaceous vegetation and seasonal ponding.		Rating=Low Qualifiers: (3, 5)
Nutrient & Toxicant Removal	<b>X</b>		Dense herbaceous vegetation is present in portions of wetland. East Lake Sammamish Parkways is directly upslope.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization		<b>X</b>	Wetland is not associated with a watercourse.		
Production of Organic Matter and its Export	<b>X</b>		Dense vegetation is present in wetland, but inundation is likely short term.		Rating=Low Qualifiers: (1, 4, 6)
General Habitat Suitability	<b>X</b>		Dense vegetation likely provides minimal levels of this function. Buffer is developed.		Rating=Low
Habitat for Aquatic Invertebrates	<b>X</b>		Seasonal inundation is limited to ditched portion of wetland. Cover is provided by leaf litter.		Rating=Low Qualifiers: (1, 4, 5, 6)
Habitat for Amphibians	<b>X</b>		Wetland may provide refuge habitat for amphibians. Wetland likely is not used for amphibian breeding.		Rating=Low Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		<b>X</b>	Wetland does not have permanent water.		
Habitat for Wetland-Associated Birds		<b>X</b>	No open water component in the wetland.		
General Fish Habitat		<b>X</b>	Wetland is not associated with a fish bearing water.		
Native Plant Richness		<b>X</b>	Wetland is dominated by invasive species ( <i>Phalaris arundinacea</i> and <i>Rubus armeniacus</i> ).		
Educational or Scientific Value		<b>X</b>	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		<b>X</b>	No documented protected species or habitat; not determined significant by local jurisdiction.		

## Wetland Functions & Values Form

Wetland I.D. 13A Project: ELST Re-delineation Assessed by: M. Maynard

Cowardin Class: PFO/PSS/PEM Ecology Category: III Local Rating: III Wetland size: 0.40 acre Date: 10/30/07 (rev: 09/11/13)

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	X		Wetland is depressional and has capacity for some water detention. Wetland is not associated with a watercourse.		Rating=Low Qualifiers: (2)
Sediment Removal	X		Wetland may receive some sediment from trail and stormwater runoff. Dense herbaceous vegetation and standing water exist in the ditch.		Rating=Low Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	X		Wetland may receive some input from stormwater runoff. Dense herbaceous vegetation and standing water exist in the ditch.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization		X	Wetland is not associated with a watercourse.		
Production of Organic Matter and its Export	X		Dense vegetation is present in wetland, but inundation is likely short term. Export of organic matter occurs in ditch and flows to the south.		Rating= Moderate Qualifiers: (1, 6)
General Habitat Suitability	X		Wetland has habitat connectivity to Wetland 14C to the south. Surrounding area is fragmented by residential development, East Lake Sammamish Parkway, and driveways.		Rating=Low Qualifiers: (3, 5)
Habitat for Aquatic Invertebrates	X		Some seasonal inundation. Cover is provided by leaf litter.		Rating=Low Qualifiers: (1, 4, 5, 6)
Habitat for Amphibians	X		Wetland may provide refuge habitat for amphibians. Wetland likely is not used for amphibian breeding.		Rating=Low Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		X	Wetland does not have permanent ponding or open water.		
Habitat for Wetland-Associated Birds		X	Wetland does not have permanent ponding or open water.		
General Fish Habitat		X	Wetland is not associated with a fish bearing water.		
Native Plant Richness		X	Wetland is dominated by invasive species ( <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. 14A Project: ELST Re-delineation Assessed by: M. Maynard

Cowardin Class: PEM Ecology Category: IV Local Rating: IV Wetland size: 0.04 acre Date: 10/25/07 (rev: 09/11/13)

Function/Value	Occurrence Y N		Rationale	Principal Function(s)	Comments
Flood Flow Alteration	<b>X</b>		Wetland is depressional and has capacity for some water detention.		Rating=Low Qualifiers: (4)
Sediment Removal	<b>X</b>		Wetland may receive some sediment from trail and stormwater runoff. Dense herbaceous vegetation and standing water exist in the ditch.		Rating=Low Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	<b>X</b>		Wetland may receive some input from stormwater runoff. Dense herbaceous vegetation and standing water exist in the ditch.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization	<b>X</b>		Wetland is associated with two streams (Unnamed Stream 1 and Unnamed Stream2).		Rating=Low
Production of Organic Matter and its Export	<b>X</b>		Wetland is densely vegetated with herbaceous vegetation and has an outlet for organic matter export to downgradient aquatic areas.		Rating= Moderate Qualifiers: (1, 5, 6)
General Habitat Suitability	<b>X</b>		Wetland is connected to other habitats by surface water that runs through it.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	<b>X</b>		Wetland is vegetated with emergent vegetation and has surface water flowing through it.		Rating=Low Qualifiers: (1, 4, 6)
Habitat for Amphibians	<b>X</b>		Wetland is vegetated with emergent vegetation and has surface water flowing through it.		Rating=Low Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		<b>X</b>	Wetland has permanent ponding but no open water.		
Habitat for Wetland-Associated Birds		<b>X</b>	Wetland has permanent ponding but no open water.		
General Fish Habitat	<b>X</b>		Wetland is associated with Unnamed Stream 1 and Unnamed Stream 2, and is densely vegetated with herbaceous vegetation.		Rating=Low
Native Plant Richness		<b>X</b>	Wetland is dominated by invasive species ( <i>Phalaris arundinacea</i> ).		
Educational or Scientific Value		<b>X</b>	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		<b>X</b>	No documented protected species or habitat; not determined significant by local jurisdiction.		

## Wetland Functions & Values Form

Wetland I.D. 14C

Project: ELST Re-delineation Assessed by: M. Maynard

Cowardin Class: PEM

Ecology Category: IV Local Rating: IV Wetland size: 0.05 acre Date: 10/25/07 (rev: 09/11/13)

Function/Value	Occurrence		Rationale	Principal Function(s)	Comments
	Y	N			
Flood Flow Alteration	<b>X</b>		Wetland is depressional and has capacity for some water detention. Wetland is not associated with a watercourse.		Rating=Low Qualifiers: (2)
Sediment Removal	<b>X</b>		Wetland may receive some sediment from trail and stormwater runoff. Dense herbaceous vegetation and standing water exist in the ditch.		Rating=Low Qualifiers: (1, 3, 5)
Nutrient & Toxicant Removal	<b>X</b>		Wetland may receive some input from stormwater runoff. Dense herbaceous vegetation and standing water exist in the ditch.		Rating=Low Qualifiers: (1, 2, 4)
Erosion Control & Shoreline Stabilization		<b>X</b>	Wetland is not associated with a water course.		
Production of Organic Matter and its Export	<b>X</b>		Dense vegetation is present in wetland with inundation. Export of organic matter occurs in ditch and flows to the south.		Rating= Moderate Qualifiers: (1, 5, 6)
General Habitat Suitability	<b>X</b>		Wetland has habitat connectivity to Wetland 13A to the north. Surrounding area is fragmented by residential development, East Lake Sammamish Parkway, and driveways.		Rating=Low Qualifiers: (3)
Habitat for Aquatic Invertebrates	<b>X</b>		Inundation is limited to ditched portion of wetland. Cover is provided by leaf litter.		Rating=Low Qualifiers: (1, 4, 6)
Habitat for Amphibians	<b>X</b>		Wetland may provide refuge habitat for amphibians. Wetland likely is not used for amphibian breeding.		Rating=Low Qualifiers: (1, 2, 6)
Habitat for Wetland-Associated Mammals		<b>X</b>	Wetland has permanent ponding but no open water.		
Habitat for Wetland-Associated Birds		<b>X</b>	Wetland has permanent ponding but no open water.		
General Fish Habitat		<b>X</b>	Wetland is not associated with a fish bearing water.		
Native Plant Richness		<b>X</b>	Wetland is dominated by invasive species ( <i>Phalaris arundinacea</i> ).		
Educational or Scientific Value		<b>X</b>	There is no nearby parking & the site has no documented scientific or educational use.		
Uniqueness and Heritage		<b>X</b>	No documented protected species or habitat; not determined significant by local jurisdiction.		



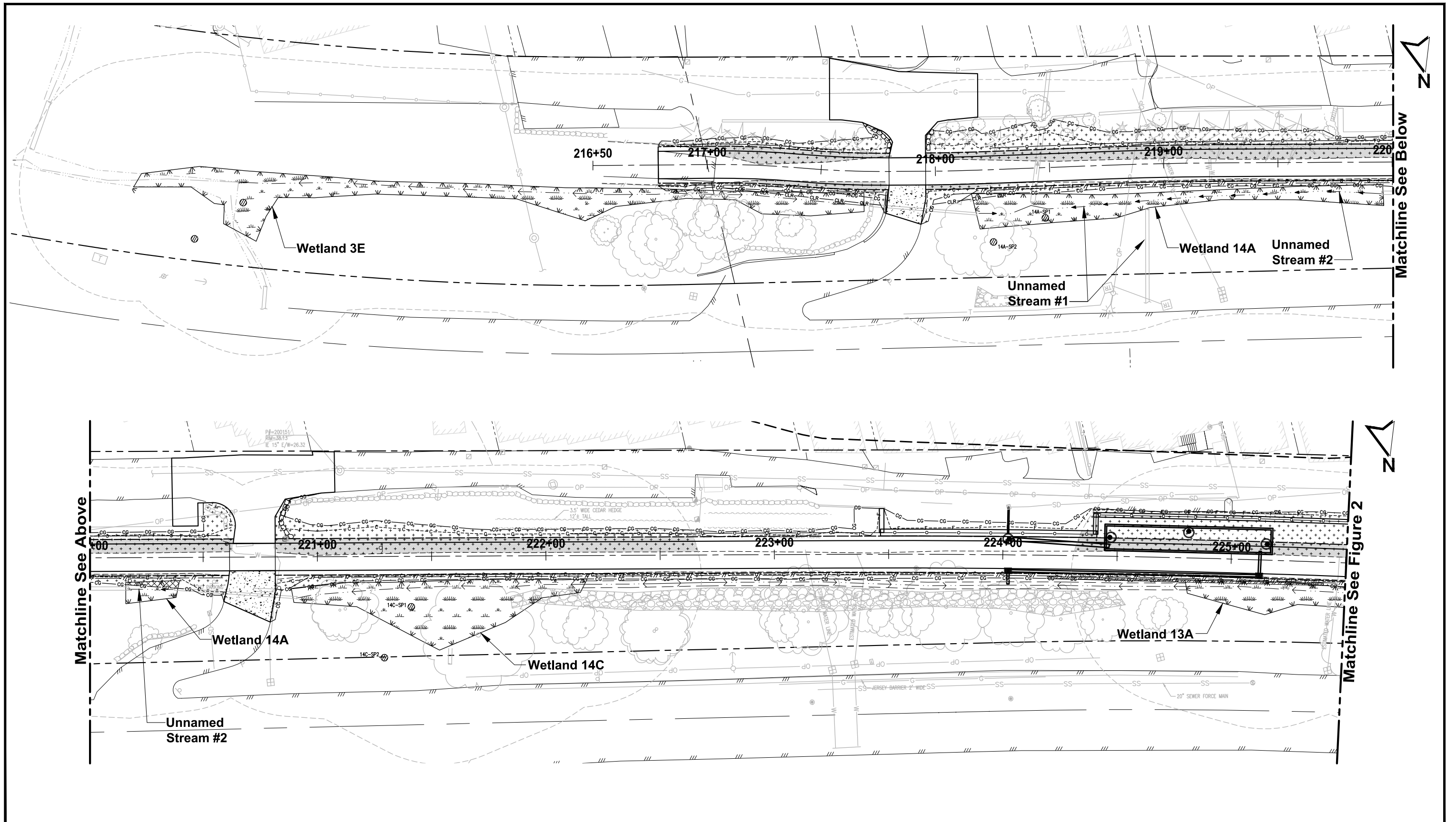
## Appendix E

### Critical Area Impact Figures









Parametrix DATE: April 27, 2015 FILE: BL1521075P19T09-F-01

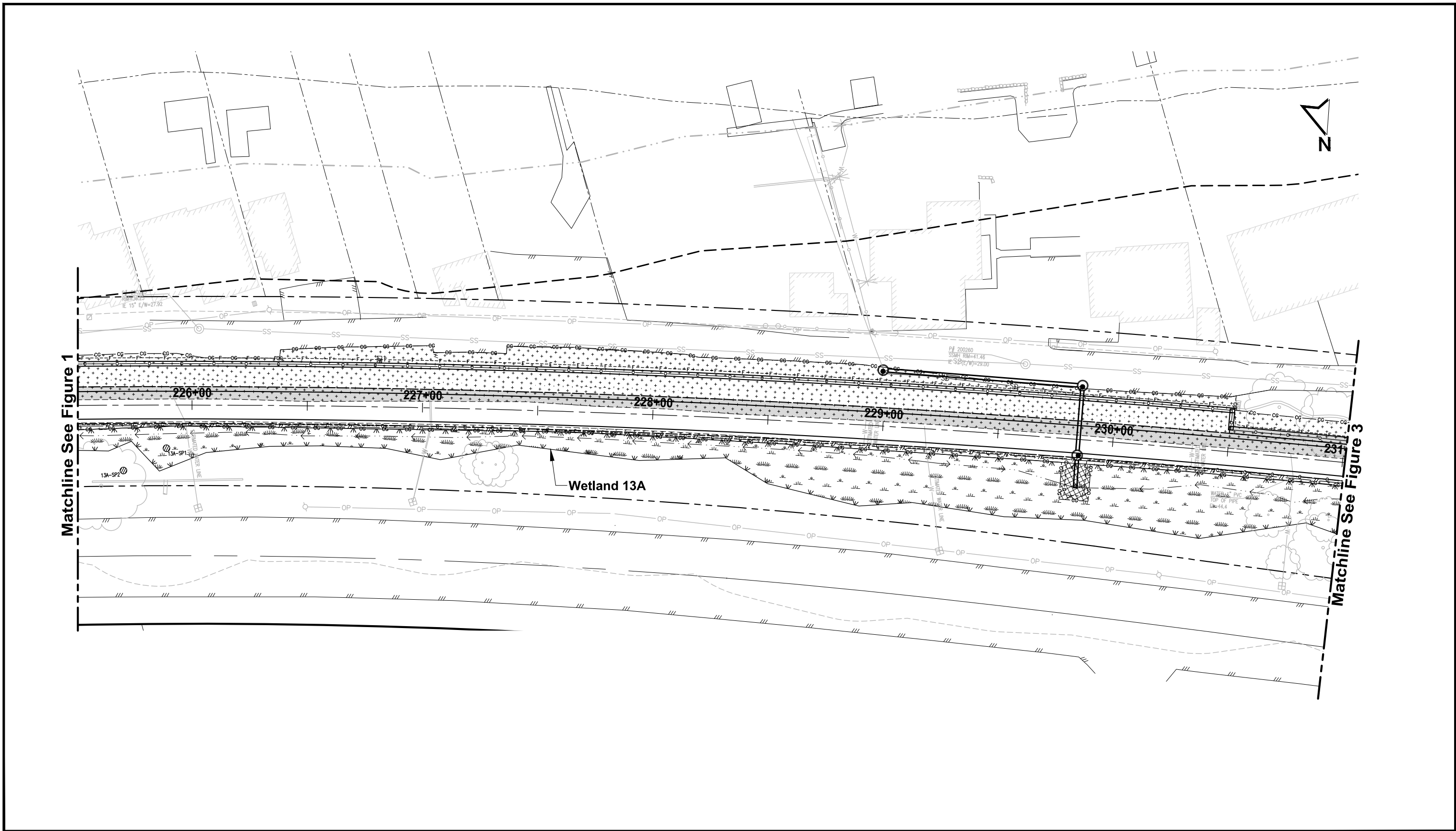


**Legend:**

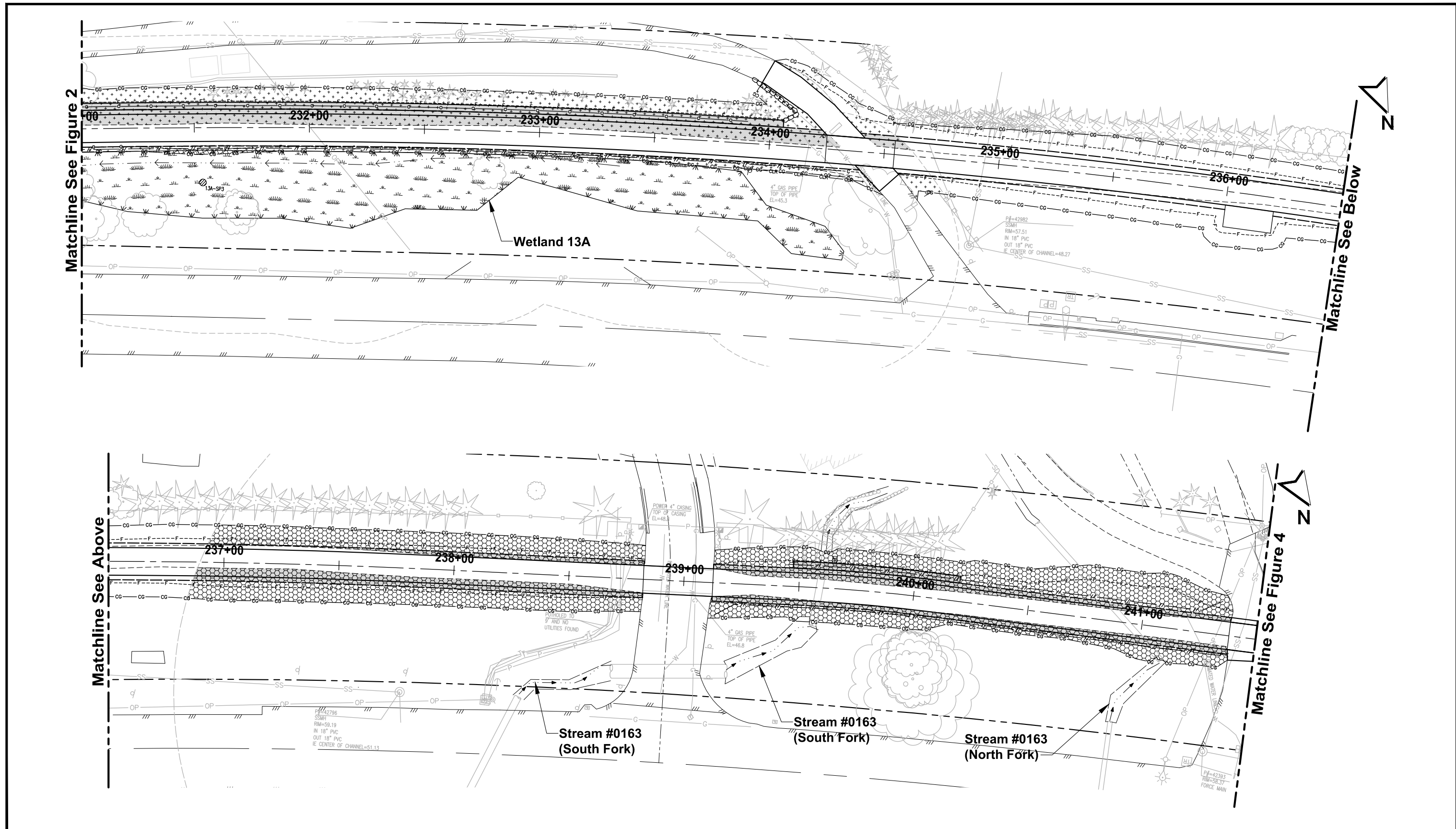
10C-SP2	Data Plot	---	Lake OHWM	[Cross-hatch pattern]	Temp. Wetland Impact
[Wetland boundary line]	Wetland Boundary	---	Shoreline Setback	[Stippled pattern]	Perm. Wetland Buffer Impact
[Dashed line]	Wetland Buffer	---	Right of Way	[Star pattern]	Temp. Wetland Buffer Impact
[Dashed line]	Stream Buffer	[Thick solid line]	Retaining Walls	[Square pattern]	Perm. Stream Buffer Impact
[Dashed line]	Stream OHWM	---	Fill Limit	[Hexagon pattern]	Temp. Stream Buffer Impact
[Dashed line]	Stream Centerline	---	Cut Limit		
[Dashed line]	Ditch	---	Clearing/Grubbing Limit		

**Figure 1**  
**Critical Area Impacts**  
**East Lake Sammamish Trail**  
**South Sammamish - Segment A**









Parametrix DATE: April 27, 2015 FILE: BL1521075P19T09-F-01



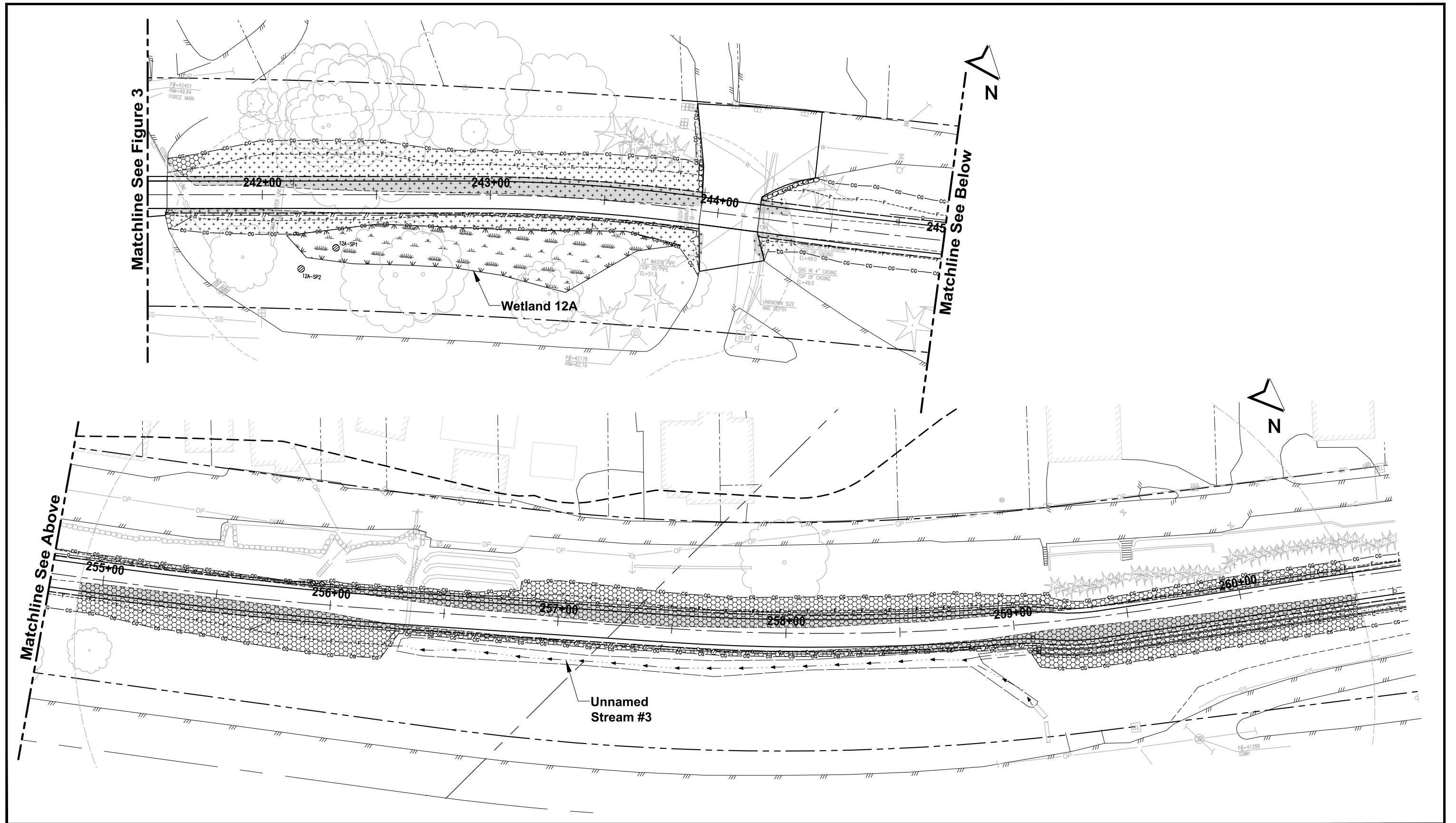
**Legend:**

- |                           |                   |                              |                       |                             |
|---------------------------|-------------------|------------------------------|-----------------------|-----------------------------|
| 10C-SP2                   | Data Plot         | --- Lake OHWM                | [Cross-hatch pattern] | Temp. Wetland Impact        |
| [Wetland boundary symbol] | Wetland Boundary  | --- Shoreline Setback        | [Stippled pattern]    | Perm. Wetland Buffer Impact |
| --- Wetland Buffer        | Wetland Buffer    | --- Right of Way             | [Star pattern]        | Temp. Wetland Buffer Impact |
| --- Stream Buffer         | Stream Buffer     | [Thick line] Retaining Walls | [Dotted pattern]      | Perm. Stream Buffer Impact  |
| --- Stream OHWM           | Stream OHWM       | --- Fill Limit               | [Hexagon pattern]     | Temp. Stream Buffer Impact  |
| --- Stream Centerline     | Stream Centerline | --- Cut Limit                |                       |                             |
| --- Ditch                 | Ditch             | --- Clearing/Grubbing Limit  |                       |                             |

**Figure 3**  
**Critical Area Impacts**  
**East Lake Sammamish Trail**  
**South Sammamish - Segment A**







Parametrix DATE: April 27, 2015 FILE: BL1521075P19T09-F-01



**Legend:**

10C-SP2	Data Plot	---	Lake OHHM	[Cross-hatch pattern]	Temp. Wetland Impact
[Wetland boundary symbol]	Wetland Boundary	---	Shoreline Setback	[Dotted pattern]	Perm. Wetland Buffer Impact
---	Wetland Buffer	---	Right of Way	[Star pattern]	Temp. Wetland Buffer Impact
---	Stream Buffer	---	Retaining Walls	[Hexagon pattern]	Perm. Stream Buffer Impact
---	Stream OHHM	---	Fill Limit	[Circle pattern]	Temp. Stream Buffer Impact
---	Stream Centerline	---	Cut Limit		
---	Ditch	---	Clearing/Grubbing Limit		

**Figure 4**  
**Critical Area Impacts**  
**East Lake Sammamish Trail**  
**South Sammamish - Segment A**

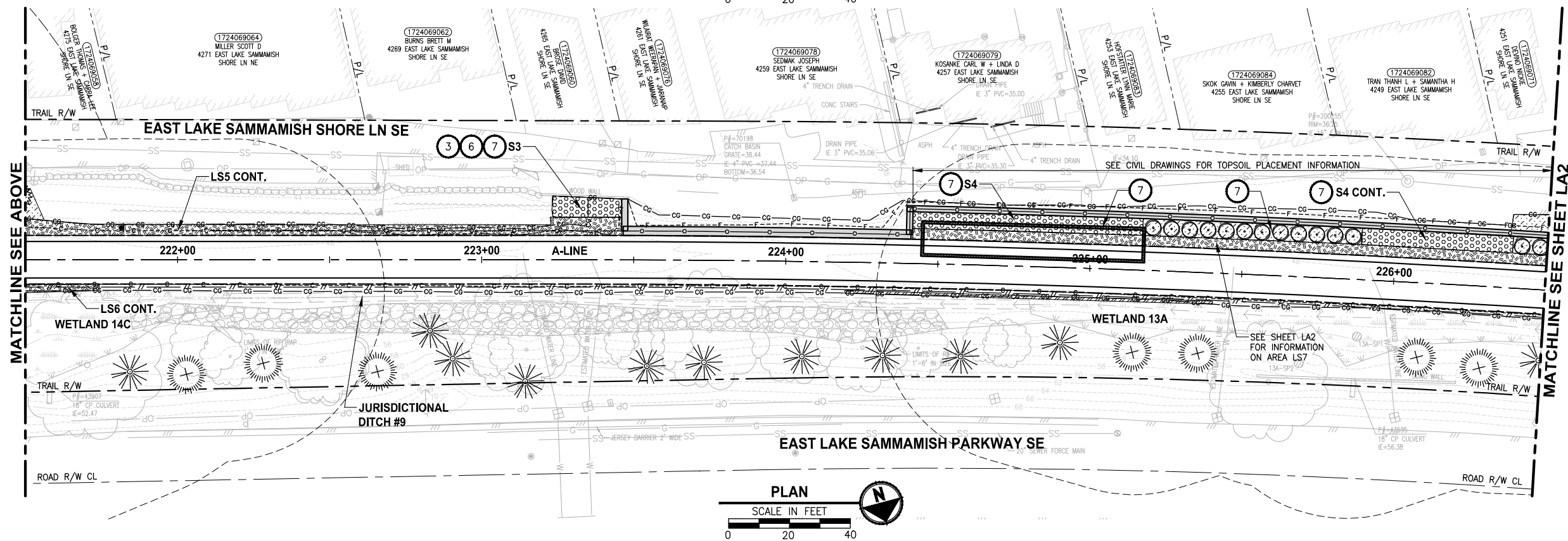
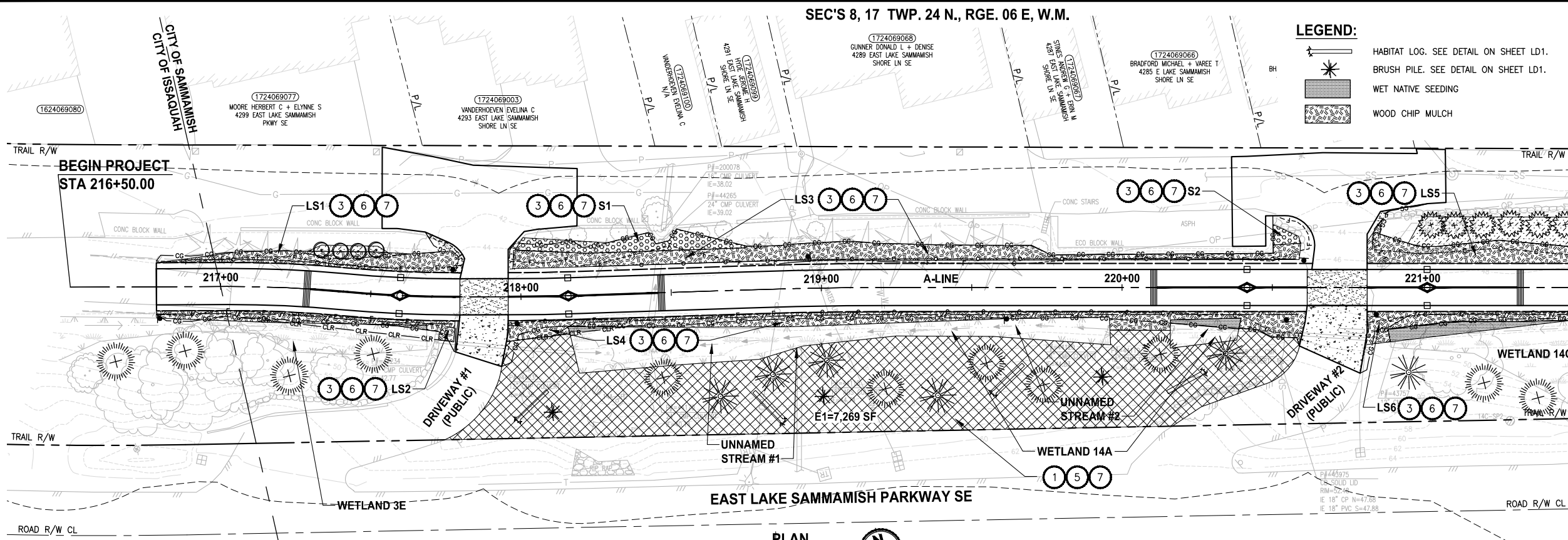


# Appendix F

## Landscape Plan with Mitigation








**LANDSCAPE CONSTRUCTION NOTES:**

- 1 MITIGATION CLEARING AND GRUBBING. CLEAR GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN ALL PLANTING AREAS. LEAVE SOIL IN PLACE.
- 2 HERBICIDE TREATMENT. TREAT UNWANTED VEGETATION WITHIN ALL PLANTING AREAS 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.
- 3 TILLING. LOOSEN SOIL IN PLANTING AREA BY RIPPING OR TILLING TO A DEPTH OF 18". HAND TILL ONLY WITHIN THE DRIPLINE OF EXISTING TREES.
- 4 SOIL AMENDMENT. PLACE 3" SOIL AMENDMENT AND TILL INTO SOIL TO A DEPTH OF 10" IN ALL PLANTING AREAS. SEE DETAIL 6 ON SHEET LD1.
- 5 FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE A 3" LAYER IF FINE COMPOST OVER THE ENTIRE SURFACE OF THIS PLANTING AREA.
- 6 TOPSOIL A. PLACE 12" LAYER TOPSOIL OVER THE ENTIRE SURFACE OF PLANTING AREA.
- 7 WOOD CHIP MULCH. PLACE 3" LAYER WOOD CHIP MULCH OVER THE ENTIRE SURFACE OF ALL PLANTING AREAS.
- 8 KNOTWEED CONTROL HERBICIDE TREATMENT IN THIS AREA. SEE SPECIFICATIONS FOR METHODS AND ADDITIONAL REQUIREMENTS.

**GENERAL NOTES:**


1. SEE SHEET LD1 FOR ADDITIONAL PLANTING NOTES, DETAILS AND REQUIREMENTS. SEE SHEET LD2 FOR MITIGATION AREA REQUIREMENTS.
2. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRILIPLANE AREA OF EXISTING TREES AND SHRUBS.
3. CONTRACTOR SHALL SETBACK PLANTINGS FROM OTHER OBJECTS AS PROVIDED IN THE PLANT MATERIAL SETBACK CHART ON SHEET LD1.
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**PLANTING QUANTITY TAB**  
**- THIS SHEET ONLY -**

SYMBOL ITEM		QUANTITY BY AREA						
SIGHT	DISTANCE	PLANTING	LS1	LS2	LS3	LS4	LS5	LS6
	LOW SHRUBS 2' O.C.							
	SALAL		32	22	80	79	92	27
	CREeping MAHONIA		24	17	60	59	69	20
	SWORD FERN		24	17	60	59	69	20

[illegible]

WETLAND BUFFER ENHANCEMENT AREA		E1
	#1 CONTAINER SHRUBS 4' O.C.	
	WESTERN HAZEL	79
	PACIFIC NINEBARK	79
	INDIAN PLUM	79
	RED FLOWERING CURRANT	79
	NOOTKA ROSE	105
	SNOWBERRY	105
	TREES 8' O.C.	
	BIG LEAF MAPLE	13
WESTERN SERVICEBERRY	26	
PACIFIC DOGWOOD	33	
BITTER CHERRY	33	
DOUGLAS FIR	7	
WESTERN RED CEDAR	7	
TREES AND SHRUBS		

	WAX MYRTLE	18
	DOUGLAS FIR	16
	WESTERN RED CEDAR	18
	'EXCELSA' RED CEDAR	6

CITY OF SAMMAMISH APPROVAL	
City Engineer _____	Date _____
Community Development _____	Date _____


**DPER ACTIVITY NUMBER**  
**GRDE14-0052 / SHORE14-0022**  
**FEDERAL AID #**

**95 % REVIEW SUBMITTAL**  
NOT FOR CONSTRUCTION

## LANDSCAPE PLAN

SHEET NO.  
65 OF 78

**LA1**

	REVISIONS	DATE	BY	DESIGNED J. SWENSON
				DRAWN B. PURGANAN
				CHECKED Y. HO
				APPROVED O. KIKUTA

ONE INCH AT FULL SCALE.  
IF NOT, SCALE ACCORDINGLY

FILE NAME
BL1521075P20T03LA-01
JOB No.
554-1521-075 P20T03
DATE
APRIL 2015



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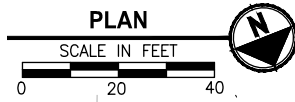
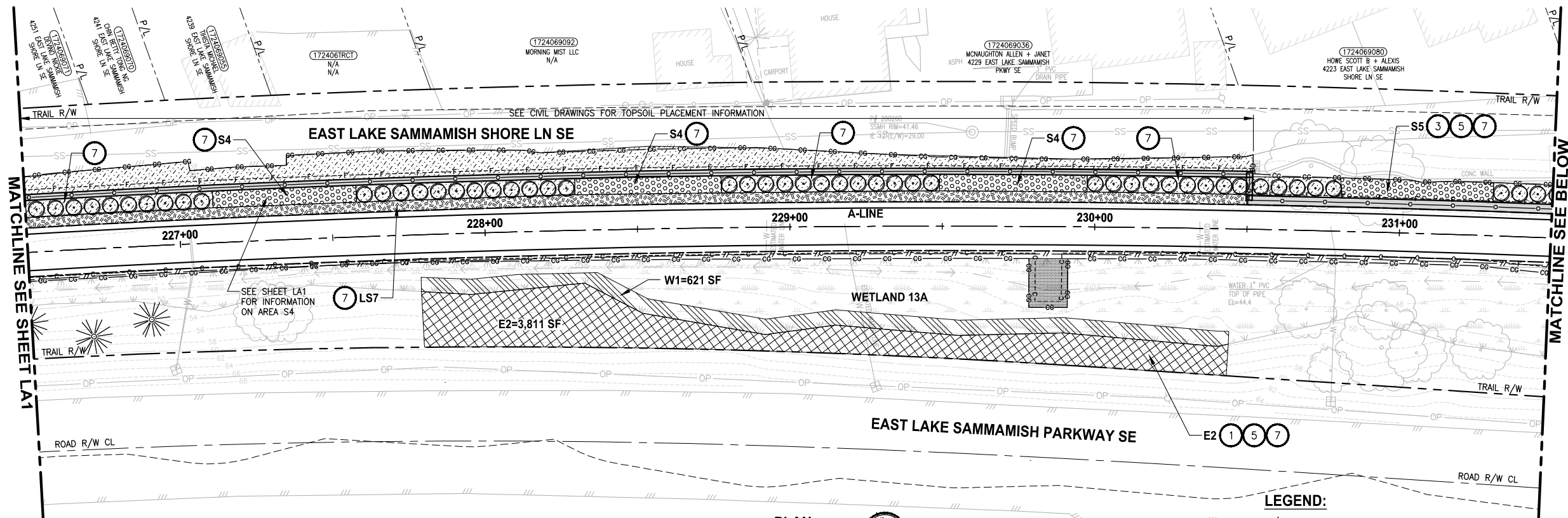
PROJECT NAME

**EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**

SAMMAMISH, WA

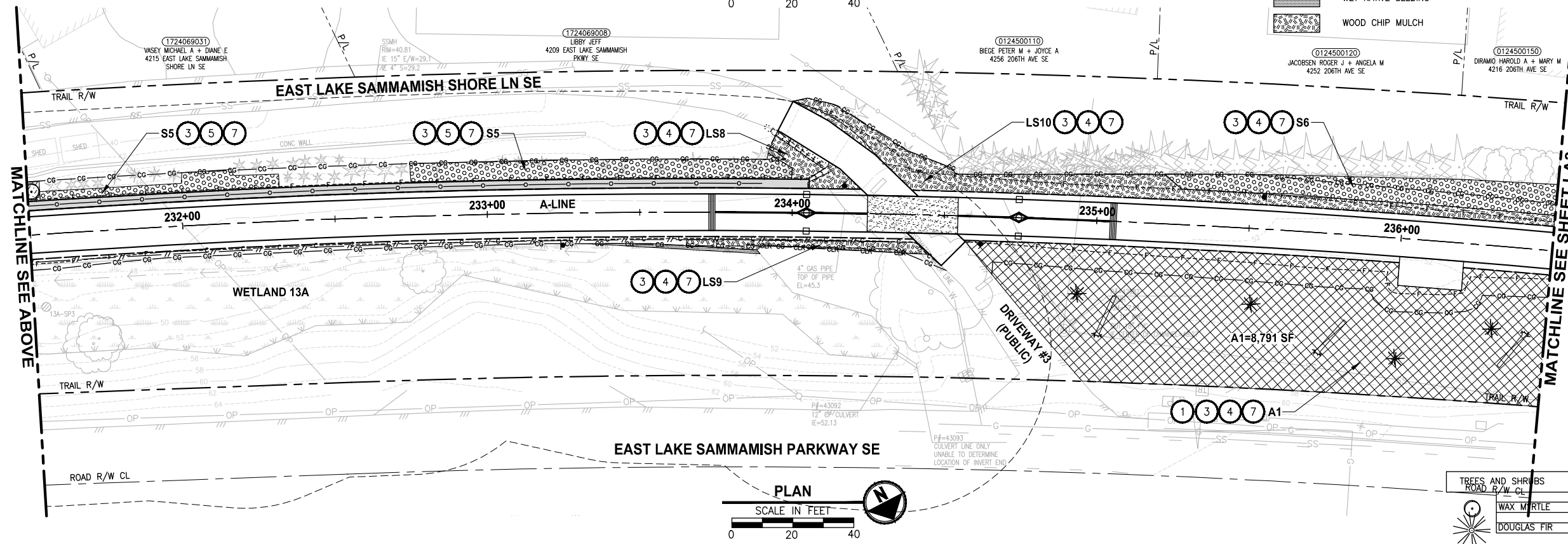






## LEGEND:

- HABITAT LOG. SEE DETAIL ON SHEET LD1.
- BRUSH PILE. SEE DETAIL ON SHEET LD1.
- WET NATIVE SEEDING
- WOOD CHIP MULCH



## LANDSCAPE CONSTRUCTION NOTES:

- MITIGATION CLEARING AND GRUBBING. CLEAR GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN ALL PLANTING AREAS. LEAVE SOIL IN PLACE.
- HERBICIDE TREATMENT. TREAT UNWANTED VEGETATION WITHIN ALL PLANTING AREAS 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.
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## GENERAL NOTES:

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PLANTING QUANTITY TAB  
- THIS SHEET ONLY -

SYMBOL	ITEM	QUANTITY BY AREA			
SIGHT DISTANCE PLANTING AREAS		LS7	LS8	LS9	LS10
	LOW SHRUBS 2' O.C.				
	SALAL	160	8	16	100
	CREEPING MAHONIA	120	6	12	75
	SWORD FERN	120	6	12	75

SHRUBS PLANTING AREAS		S5	S6
#2 CONTAINER SHRUBS 5' O.C.			
STRAWBERRY TREE		0	31
TALL OREGON GRAPE		0	0
MOCK ORANGE		35	32
FLOWERING CURRANT		35	0
DAVIDS VIBURNUM		0	0
CRANBERRY BUSH		0	12

WETLAND BUFFER ADDITION AND ENHANCEMENT AREAS		A1	E2
LOW SHRUBS 2.5' O.C.			
SALAL		114	0
CREEPING MAHONIA		81	0
SWORD FERN		81	0

#1 CONTAINER SHRUBS 4' O.C.			
WESTERN HAZEL		32	33
MOCK ORANGE		95	0
PACIFIC NINEBARK		95	33
INDIAN PLUM		64	33
RED FLOWERING CURRANT		64	33
NODDIA ROSE		127	43
SNOWBERRY		127	43
TREES 8' O.C.			
VINE MAPLE		16	0
BIG LEAF MAPLE		16	0
WESTERN SERVICEBERRY		16	11
PACIFIC DOGWOOD		16	11
BITTER CHERRY		16	11
DOUGLAS FIR		24	11
WESTERN RED CEDAR		24	11
WESTERN HEMLOCK		24	0

WETLAND ENHANCEMENT AREA		W1
LIVESTAKE CUTTINGS 4' O.C.		
PACIFIC WILLOW		47
SITKA WILLOW		47

## CITY OF SAMMAMISH APPROVAL

City Engineer	Date
Community Development	Date

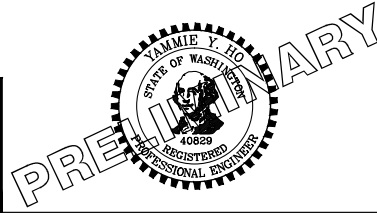
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GRDE14-0052 / SHORE14-0022  
FEDERAL AID #95 % REVIEW SUBMITTAL  
NOT FOR CONSTRUCTION

## LANDSCAPE PLAN

SHEET NO.  
65 OF 78

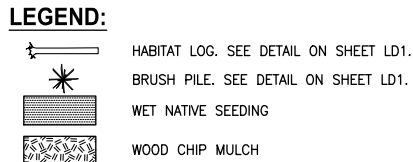
LA2

REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			B. PURGANAN
			CHECKED
			Y. HO
			APPROVED
			O. KIKUTA

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JOB No.  
554-1521-075 P20T03  
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EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A  
SAMMAMISH, WA







1. SEE SHEET LD1 FOR ADDITIONAL PLANTING NOTES, DETAILS AND REQUIREMENTS. SEE SHEET LD2 FOR MITIGATION AREA REQUIREMENTS.
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CITY OF SAMMAMISH APPROVAL	
City Engineer _____	Date _____
Community Development _____	Date _____

## LA3

**PLAN**

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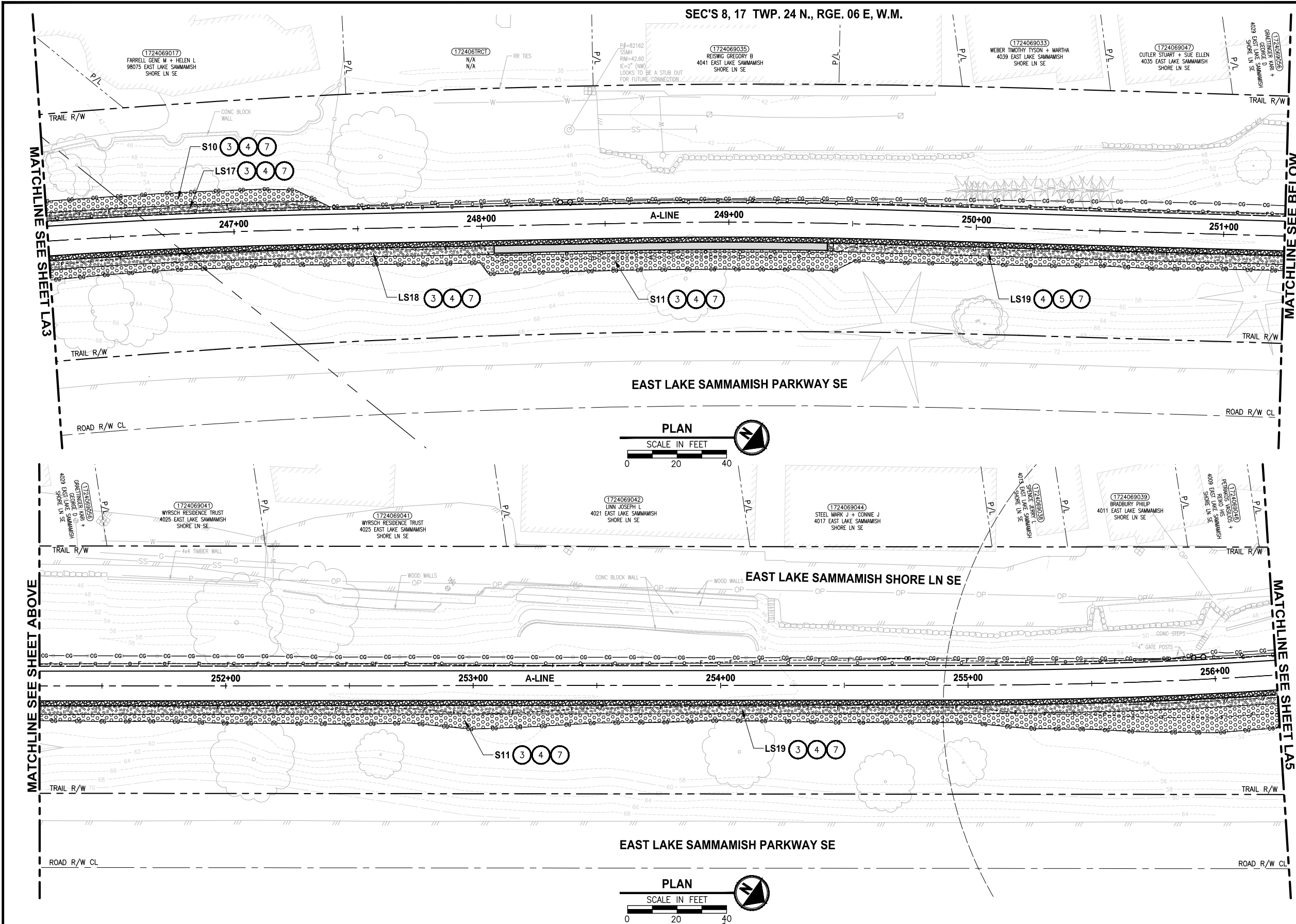
PROJECT NAME

**EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**

SAMMAMISH, WA







**LANDSCAPE CONSTRUCTION NOTES:**

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**PLANTING QUANTITY TAB**  
**- THIS SHEET ONLY -**

SYMBOL ITEM		QUANTITY BY AREA		
SIGHT DISTANCE PLANTING AREAS		LS17	LS18	LS19
	LOW SHRUBS 2' O.C.			
	SALAL	70	88	267
	CREeping MAHONIA	52	66	200
	SWORD FERN	52	66	200

CITY OF SAMMAMISH APPROVAL	
City Engineer	Date
Community Development	Date

**DPER ACTIVITY NUMBER**  
**GRDE14-0052 / SHORE14-0022**  
**FEDERAL AID #**

**95 % REVIEW SUBMITTAL**  
NOT FOR CONSTRUCTION

## LANDSCAPE PLAN

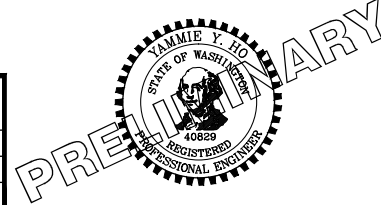
SHEET NO.  
68 OF 78

## LA4

▷	REVISIONS	DATE	BY	DESIGNED J. SWENSON
				DRAWN B. PURGANAN
				CHECKED Y. HO
				APPROVED C. KIKUTA

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IF NOT, SCALE ACCORDINGLY

FILE NAME
BL1521075P20T03LA-01
JOB No.
554-1521-075 P20T03
DATE
APRIL 2015



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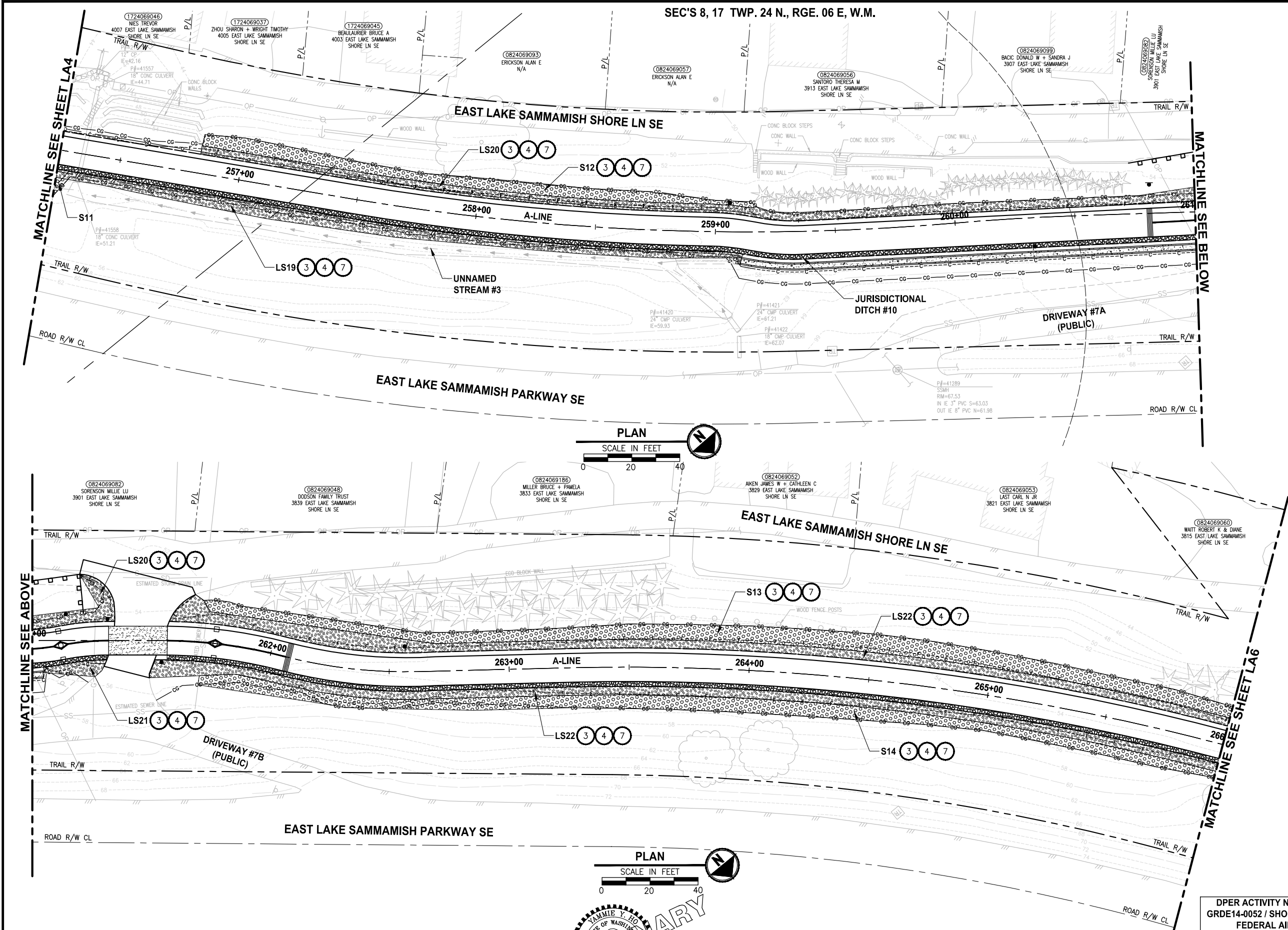
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PROJECT NAME  
**EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**  
SAMMAMISH, WA





PATH: U:\PSO\Projects\Clients\1521-075-ELST\99Sves\CA00\Phase 20\Task 03\DWG\ PLOTTED BY: purgubut DATE: Monday, April 20, 2015 1:56:27 PM LAYOUT: LA5





#### LANDSCAPE CONSTRUCTION NOTES:

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#### PLANTING QUANTITY TAB - THIS SHEET ONLY -

SYMBOL ITEM		QUANTITY BY AREA	
SIGHT DISTANCE PLANTING AREAS		LS20	LS21
	LOW SHRUBS 2.5' O.C.		
	SALAL	134	9
	CREeping MAHONIA	101	7
	SWORD FERN	101	7
SHRUBS PLANTING AREAS		S12	
	#1 CONTAINER SHRUBS 5' O.C.		
	MOCK ORANGE	7	
	PACIFIC NINEBARK	14	
	INDIAN PLUM	7	
	RED FLOWERING CURRANT	14	
	NODDIA ROSE	14	
	SNOWBERRY	14	

CITY OF SAMMAMISH APPROVAL	
City Engineer	Date
Community Development	Date

DPER ACTIVITY NUMBER  
GRDE14-0052 / SHORE14-0022  
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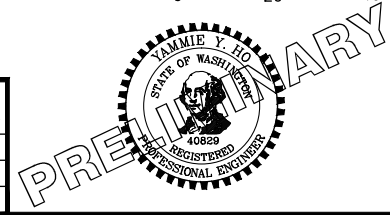
REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			B. PURGANAN
			CHECKED
			Y. HO
			APPROVED
			O. KIKUTA

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JOB No.  
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PROJECT NAME

**EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**

SAMMAMISH, WA

**LANDSCAPE PLAN**

SHEET NO.  
69 OF 78

**LA5**



SEC'S 8, 17 TWP. 24 N., RGE. 06 E, W.M.

LANDSCAPE CONSTRUCTION NOTES:

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PLANTING QUANTITY TAB  
- THIS SHEET ONLY -

SYMBOL ITEM	QUANTITY BY AREA	
	LS22	LS23
SIGHT DISTANCE PLANTING AREAS		
LOW SHRUBS 2.5' O.C.		
SALAL	606	531
CREeping MAHONIA	454	398
SWORD FERN	454	398
SHRUBS PLANTING AREAS	S13	S14
#1 CONTAINER SHRUBS 5' O.C.		
RED FLOWERING CURRANT	179	116
NOOTKA ROSE	184	120
SNOWBERRY	179	116

CITY OF SAMMAMISH APPROVAL

City Engineer \_\_\_\_\_ Date \_\_\_\_\_  
Community Development \_\_\_\_\_ Date \_\_\_\_\_

DPER ACTIVITY NUMBER  
GRDE14-0052 / SHORE14-0022  
FEDERAL AID #

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LANDSCAPE PLAN

SHEET NO.  
70 OF 78

LA6

PROJECT NAME  
EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A  
SAMMAMISH, WA

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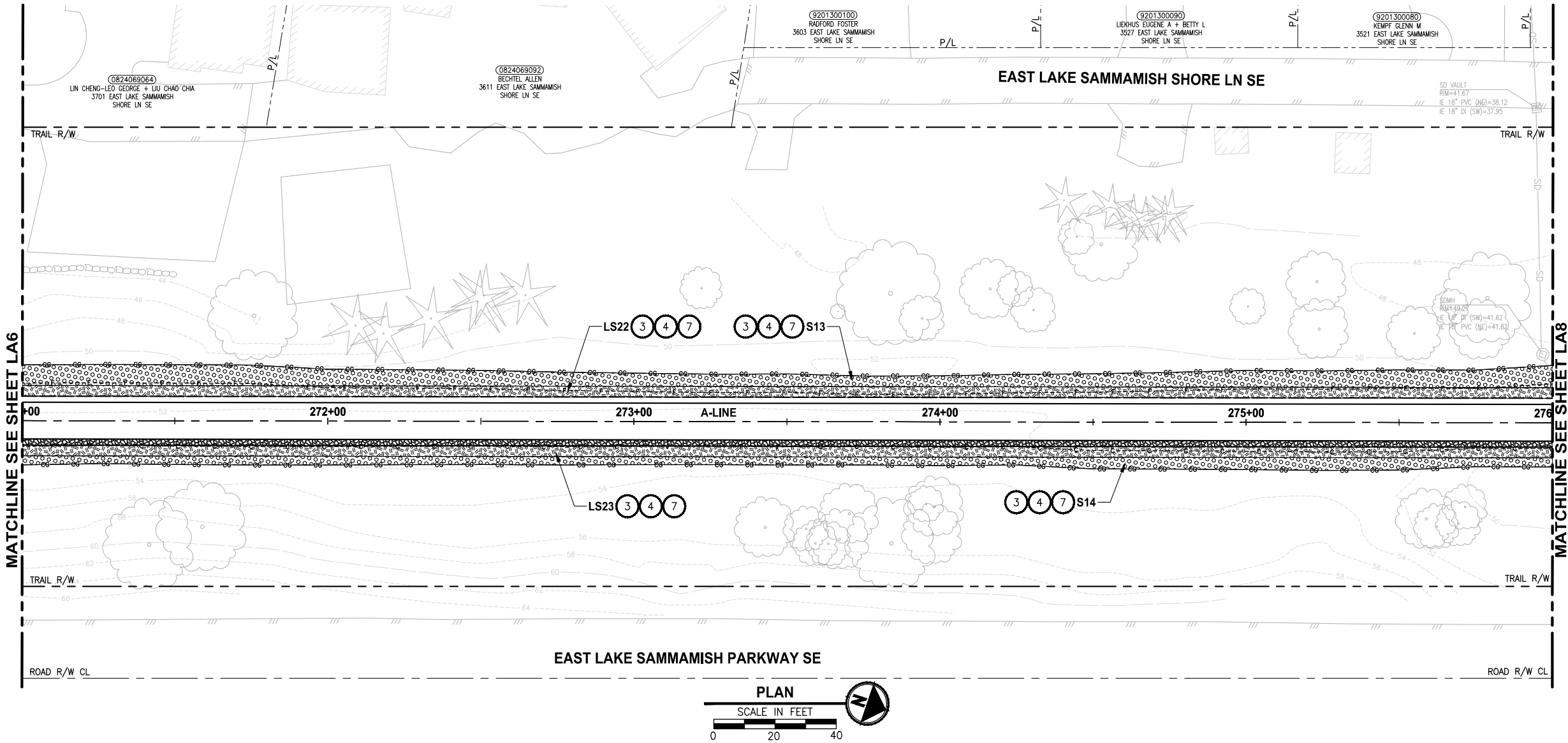
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FILE NAME  
BL1521075P20T03LA-01  
JOB No.  
554-1521-075 P20T03  
DATE  
APRIL 2015

REVISIONS	DATE	BY	DESIGNED J. SWENSON
			DRAWN B. PURGANAN
			CHECKED Y. HO
			APPROVED O. KIKUTA

LAYOUT: LA6 PATH: U:\P50\Projects\Clients\1521-075-ELST\99Sect\CAD\Phase 20\Task 03\DWG\ PLOTTED BY: purgaban DATE: Monday, April 20, 2015 1:56:36 PM







LANDSCAPE CONSTRUCTION NOTES:

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LAYOUT: LA7  
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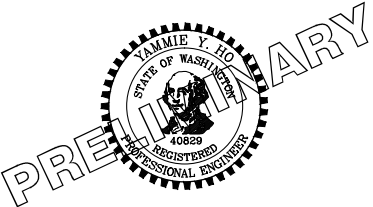
REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			DRAWN
			B. PURGANAN
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			Y. HO
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PROJECT NAME

**EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**

SAMMAMISH, WA

DPER ACTIVITY NUMBER  
GRDE14-0052 / SHORE14-0022  
FEDERAL AID #

**95 % REVIEW SUBMITTAL  
NOT FOR CONSTRUCTION**

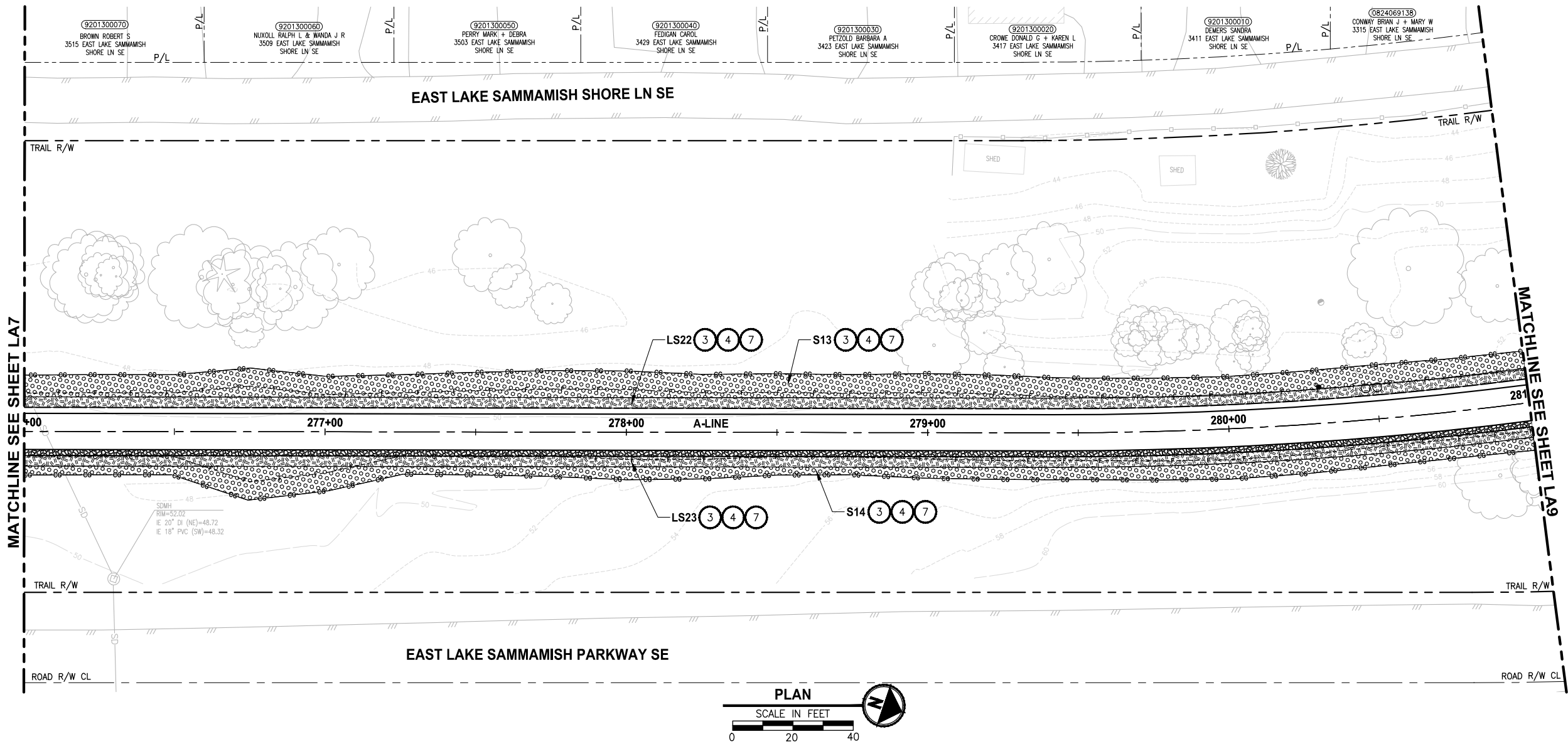
**LANDSCAPE PLAN**

SHEET NO.  
71 OF 78

**LA7**

CITY OF SAMMAMISH APPROVAL	
City Engineer _____	Date _____
Community Development _____	Date _____





LANDSCAPE CONSTRUCTION NOTES:

1. MITIGATION CLEARING AND GRUBBING. CLEAR GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN ALL PLANTING AREAS. LEAVE SOIL IN PLACE.
2. HERBICIDE TREATMENT. TREAT UNWANTED VEGETATION WITHIN ALL PLANTING AREAS 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.
3. TILLING. LOOSEN SOIL IN PLANTING AREA BY RIPPING OR TILLING TO A DEPTH OF 18". HAND TILL ONLY WITHIN THE DRIPLINE OF EXISTING TREES.
4. SOIL AMENDMENT. PLACE 3" SOIL AMENDMENT AND TILL INTO SOIL TO A DEPTH OF 10" IN ALL PLANTING AREAS. SEE DETAIL 6 ON SHEET LD1.
5. FINE COMPOST. PRIOR TO PLANTING AND PLACEMENT OF MULCH PLACE A 3" LAYER IF FINE COMPOST OVER THE ENTIRE SURFACE OF THIS PLANTING AREA.
6. TOPSOIL A. PLACE 12" LAYER TOPSOIL OVER THE ENTIRE SURFACE OF PLANTING AREA.
7. WOOD CHIP MULCH. PLACE 3" LAYER WOOD CHIP MULCH OVER THE ENTIRE SURFACE OF ALL PLANTING AREAS.
8. KNOTWEED CONTROL HERBICIDE TREATMENT IN THIS AREA. SEE SPECIFICATIONS FOR METHODS AND ADDITIONAL REQUIREMENTS.

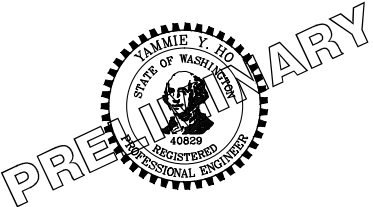
GENERAL NOTES:

1. SEE SHEET LD1 FOR ADDITIONAL PLANTING NOTES, DETAILS AND REQUIREMENTS. SEE SHEET LD2 FOR MITIGATION AREA REQUIREMENTS.
2. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRIPLINE AREA OF EXISTING TREES AND SHRUBS.
3. CONTRACTOR SHALL SETBACK PLANTINGS FROM OTHER OBJECTS AS PROVIDED IN THE PLANT MATERIAL SETBACK CHART ON SHEET LD1.
4. PLACE 4" TOPSOIL AND SEED ALL DISTURBED AREAS OUTSIDE OF WETLANDS WITH WILDFLOWER SEED MIX. TEMPORARY DISTURBANCE OF WETLAND AREAS SHALL BE RESTORED WITH WET NATIVE SEED OR AS DIRECTED BY OWNERS REPRESENTATIVE.

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PATH: U:\P50\Projects\Clients\1521-KingCo\554-1521-075-ELST\99Sves\CA00\Phase 20\Task 03\DWG\

REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			DRAWN
			B. PURGANAN
			CHECKED
			Y. HO
			APPROVED
			O. KIKUTA

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FILE NAME  
BL1521075P20T03LA-01  
JOB No.  
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DATE  
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PROJECT NAME  
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MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**  
SAMMAMISH, WA

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**LANDSCAPE PLAN**

SHEET NO.  
72 OF 78

**LA8**

CITY OF SAMMAMISH APPROVAL	
City Engineer _____	Date _____
Community Development _____	Date _____



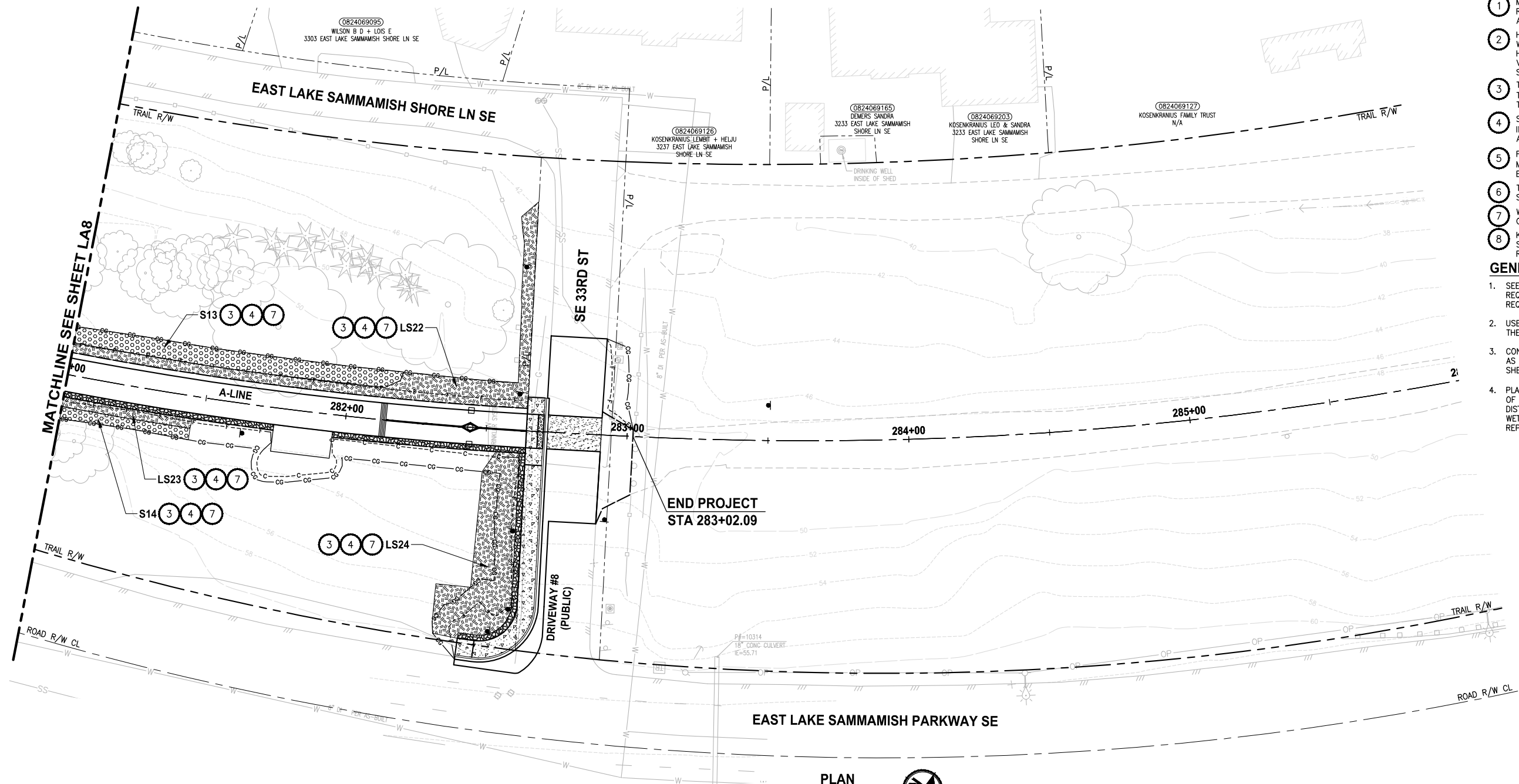


## LANDSCAPE CONSTRUCTION NOTES:

1. MITIGATION CLEARING AND GRUBBING. CLEAR GRUB ROOTS, REMOVE AND DISPOSE OF ALL UNWANTED VEGETATION IN ALL PLANTING AREAS. LEAVE SOIL IN PLACE.
2. HERBICIDE TREATMENT. TREAT UNWANTED VEGETATION WITHIN ALL PLANTING AREAS 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.
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8. KNOTWEED CONTROL HERBICIDE TREATMENT IN THIS AREA. SEE SPECIFICATIONS FOR METHODS AND ADDITIONAL REQUIREMENTS.

## GENERAL NOTES:

1. SEE SHEET LD1 FOR ADDITIONAL PLANTING NOTES, DETAILS AND REQUIREMENTS. SEE SHEET LD2 FOR MITIGATION AREA REQUIREMENTS.
2. USE ONLY HAND TOOLS AND METHODS WHEN WORKING INSIDE THE DRIPLINE AREA OF EXISTING TREES AND SHRUBS.
3. CONTRACTOR SHALL SETBACK PLANTINGS FROM OTHER OBJECTS AS PROVIDED IN THE PLANT MATERIAL SETBACK CHART ON SHEET LD1.
4. PLACE 4" TOPSOIL AND SEED ALL DISTURBED AREAS OUTSIDE OF WETLANDS WITH WILDFLOWER SEED MIX. TEMPORARY DISTURBANCE OF WETLAND AREAS SHALL BE RESTORED WITH WET NATIVE SEED OR AS DIRECTED BY OWNERS REPRESENTATIVE.

PLANTING QUANTITY TAB  
- THIS SHEET ONLY -

SYMBOL ITEM	QUANTITY BY AREA
SIGHT DISTANCE PLANTING AREAS	LS24
LOW SHRUBS 2.5' O.C.	
SALAL	81
CREEPING MAHONIA	61
SWORD FERN	61

## CITY OF SAMMAMISH APPROVAL

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Community Development	Date

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FEDERAL AID #

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## LANDSCAPE PLAN

SHEET NO.  
73 OF 78

LA9

REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			B. PURGANAN
			CHECKED
			Y. HO
			APPROVED
			O. KIKUTA

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SAMMAMISH, WA



PLANTING NOTES:

- CONTRACTOR SHALL ARRANGE TO MEET ON SITE WITH THE PROJECT REPRESENTATIVE TO DISCUSS LIMITS OF WORK AND METHODS. CONSTRUCTION ACTIVITIES SHALL NOT COMMENCE UNTIL ACCESS, LIMITS OF WORK, AND METHODS ARE APPROVED.
- ALL PLANTS TO BE SAVED AND PROTECTED WITHIN PLANTING AREAS WILL BE FLAGGED BY ENGINEER. NOTIFY ENGINEER 5 DAYS PRIOR TO START OF CLEARING ACTIVITY.
- MITIGATION PLANTING PLANS REPRESENT A CONCEPTUAL PLANT LAYOUT. FINAL PLANT LOCATIONS SHALL BE APPROVED BY PROJECT REPRESENTATIVE PRIOR TO PLANTING. COORDINATE DATA WILL BE PROVIDED ELECTRONICALLY FOR LOCATION OF PLANTING AREA BOUNDARIES.
- ALL PLANTS SHALL BE NURSERY GROWN A MINIMUM OF ONE YEAR. PLANT MATERIAL IS TO BE SUPPLIED BY COMMERCIAL NURSERIES. 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.
- 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 SP 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.

MITIGATION AREA PLANT MATERIAL LIST

QUANTITY	BOTANICAL NAME	COMMON NAME	MIN SIZE/CONDITION	NOTES/SPACING
	<u>TREES</u>			
38	ACER CIRCINATUM	VINE MAPLE	1" CALIPER	SPACE 8' O.C.
51	ACER MACROPHYLLUM	BIG LEAF MAPLE	1" CALIPER	
75	AMELANCHIER ALNIFOLIA	WESTERN SERVICEBERRY	1" CALIPER	
72	CORNUS NUTTALLII	PACIFIC DOGWOOD	1" CALIPER	
0	MALUS FUSCA	PACIFIC CRABAPPLE	1" CALIPER	
72	PRUNUS EMARGINATA	BITTER CHERRY	1" CALIPER	
66	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	3' HT	
12	SALIX SCOULERIANA	SCOULERS WILLOW	1" CALIPER	
59	THUJA PLICATA	WESTERN RED CEDAR	3' HT	SPACE 4' O.C.
24	TSUGA HETEROPHYLLA	WESTERN HEMLOCK	3' HT	
	<u>SHRUBS</u>			
0	CORNUS SERICEA	RED-TWIG DOGWOOD	12" HT/ #1 CONT	
215	CORYLUS CORNUTA	WESTERN HAZEL	12" HT/ #1 CONT	
113	PHILADELPHUS LEWISII	MOCK ORANGE	12" HT/ #1 CONT	
358	PHYSOCARPUS CAPITATUS	PACIFIC NINEBARK	12" HT/ #1 CONT	
284	OEMLERIA CERASIFORMIS	INDIAN PLUM	12" HT/ #1 CONT	
681	RIBES SANGUINEUM	FLOWERING RED CURRANT	12" HT/ #1 CONT	SPACE 4' O.C.
821	ROSA NUTKANA	NOOTKA ROSE	12" HT/ #1 CONT	
828	SYMPHORICARPOS ALBUS	SNOWBERRY	12" HT/ #1 CONT	
	<u>LIVE STAKE CUTTINGS</u>			SPACE 4' O.C.
47	SALIX LUCIDA	PACIFIC WILLOW	1/2"x 3' LIVE STAKE	
47	SALIX SITCHENSIS	SITKA WILLOW	1/2"x 3' LIVE STAKE	

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'	8'	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.

CITY OF SAMMAMISH APPROVAL	
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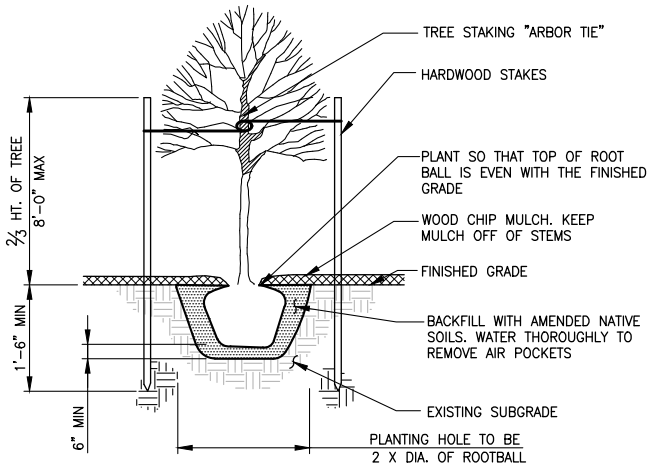
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LANDSCAPE DETAILS

SHEET NO.  
74 OF 78

LD1

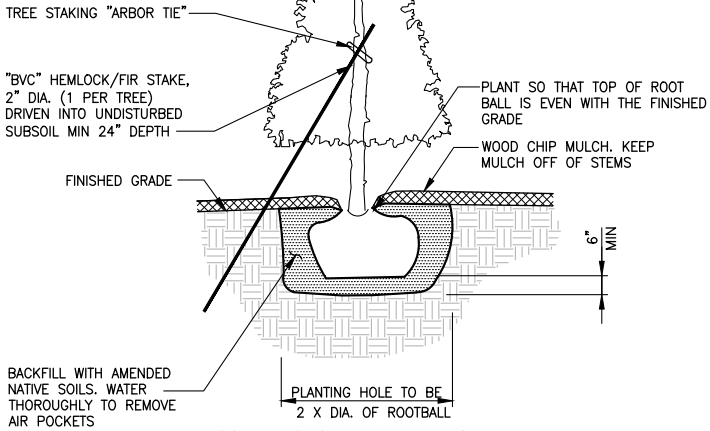
NOTE:  
STAKE ALL TREES 1" CALIPER AND GREATER.



DECIDUOUS TREE PLANTING  
DETAIL

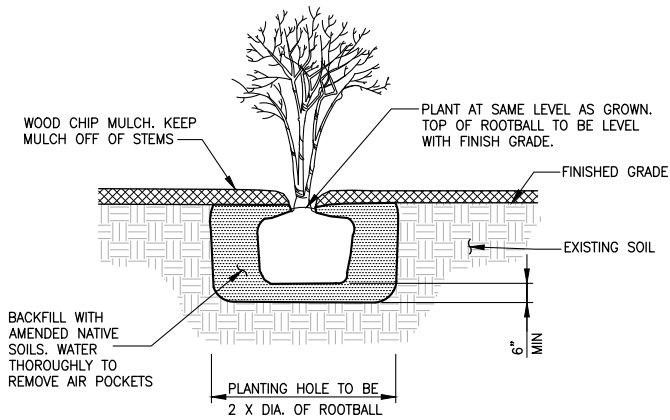
NO SCALE

NOTE:  
STAKE ALL TREES 3' AND TALLER.



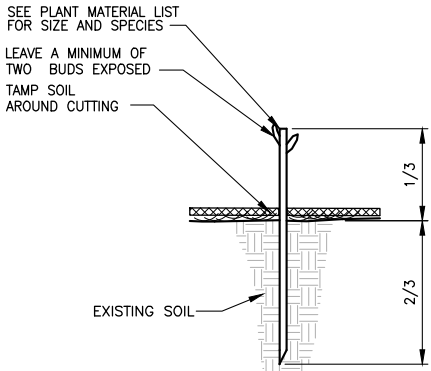
CONIFEROUS TREE PLANTING  
DETAIL

NO SCALE



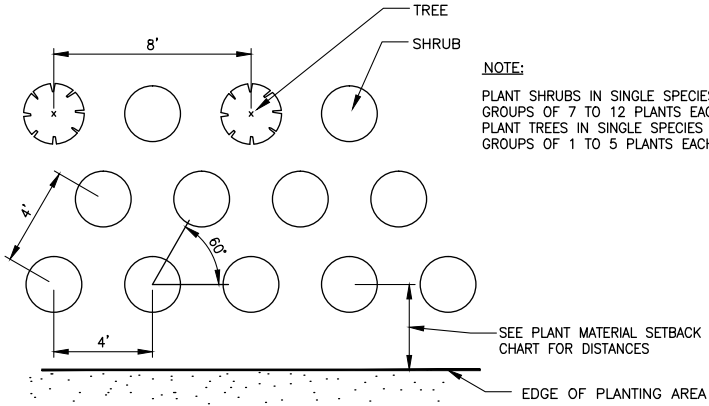
SHRUB AND SMALL TREE PLANTING  
DETAIL

NO SCALE



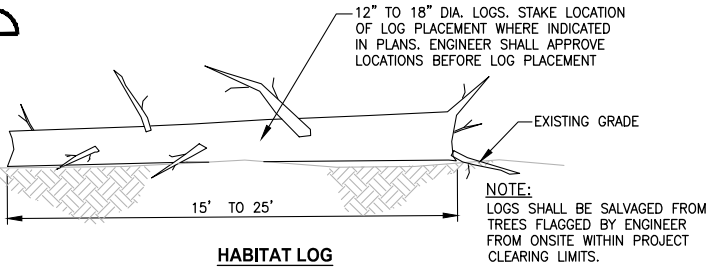
LIVE STAKE INSTALLATION  
DETAIL

NO SCALE



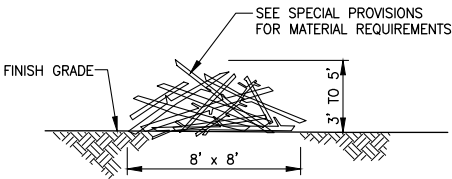
TYPICAL TREE AND SHRUB SPACING  
DETAIL

NO SCALE



HABITAT LOG  
DETAIL

NO SCALE



BRUSH PILE  
DETAIL

NO SCALE

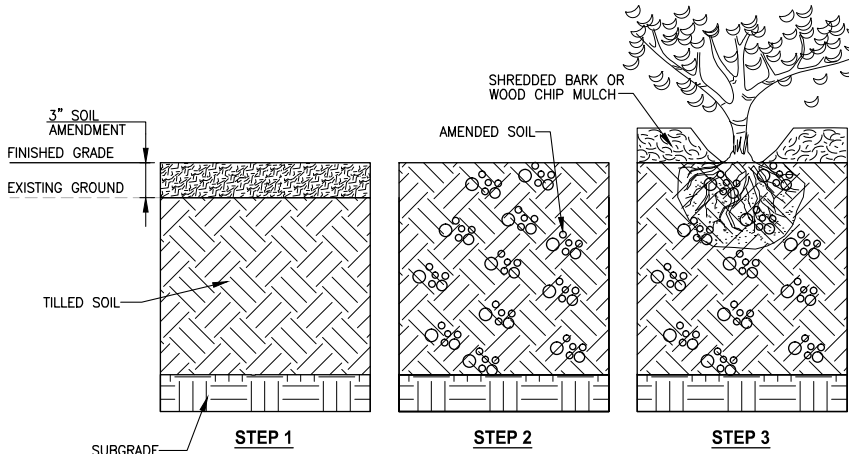
TRAILSIDE RESTORATION PLANT MATERIAL LIST

QUANTITY	BOTANICAL NAME	COMMON NAME	MIN SIZE/CONDITION	NOTES/SPACING
TREES				
19	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	6' HT	AS SHOWN ON PLAN
18	THUJA PLICATA	WESTERN RED CEDAR	6' HT	
13	THUJA PLICATA 'EXCELSA'	EXCELSA WESTERN RED CEDAR	6' HT	SPACE 6' TO 7' O.C.
SHRUBS				
38	ARBUTUS UNEDO 'COMPACTUS'	COMPACT STRAWBERRY TREE	36" HT/ #5 CONT	SPACE 5' O.C.
70	MYRICA CALIFORNICA	PACIFIC WAX MYRTLE	36" HT/ #5 CONT	SPACE 5' O.C.
22	MAHONIA AQUIFOLIUM	TALL OREGON GRAPE	36" HT/ #2 CONT	SPACE 5' O.C.
92	PHILADELPHUS LEWISII	MOCK ORANGE	36" HT/ #2 CONT	SPACE 5' O.C.
64	RIBES SANGUINEUM	FLOWERING RED CURRANT	36" HT/ #2 CONT	SPACE 5' O.C.
7	VIBURNUM DAVIDII	DAVIDS VIBURNUM	36" HT/ #2 CONT	SPACE 5' O.C.
12	VIBURNUM OPULUS	CRANBERRY BUSH	36" HT/ #2 CONT	SPACE 5' O.C.
LOW SHRUBS AND GROUND COVER				
2,983	GAULTHERIA SHALLON	SALAL	12" HT/ #1 CONT	
2,231	MAHONIA REPENS	CREeping OREGON GRAPE	12" HT/ #1 CONT	
2,231	POLYSTICHUM MUNITUM	SWORD FERN	12" HT/ #1 CONT	

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 PLANTS FOLLOWED BY 3" WOOD CHIP MULCH.

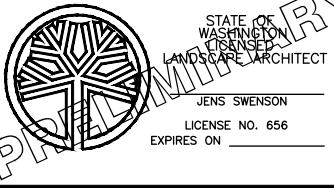


PLANTING AREA SOIL AMENDMENT-  
SEQUENCE OF WORK  
DETAIL

NO SCALE

REVISIONS	DATE	BY	DESIGNED
			J. SWENSON
			DRAWN
			B. PURGANAN
			CHECKED
			Y. HO
			APPROVED
			O. KIKUTA

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SAMMAMISH, WA





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. SPECIFIC GOALS AND OBJECTIVES FORMULATED TO ACHIEVE THIS RESULT ARE PRESENTED BELOW.

1.1 MITIGATION GOALS

THE MITIGATION GOALS ARE:

- INCREASE AND ENHANCE THE BUFFER OF TWO WETLANDS (WETLANDS 12A AND 13A) BY 0.27 ACRE.
- ENHANCE 0.25 ACRE WITHIN THE EXISTING REGULATORY BUFFER OF TWO WETLANDS (WETLANDS 13A AND 14A).
- ENHANCE 0.02 ACRE OF EXISTING WETLAND (WETLAND 13A).
- ENHANCE 0.15 ACRE OF EXISTING STREAM BUFFER (SOUTH FORK OF STREAM 0163).

ACHIEVEMENT OF THESE GOALS IS EXPECTED TO PROVIDE THE FOLLOWING IMPROVEMENTS TO WETLAND, WETLAND BUFFER, AND STREAM BUFFER FUNCTIONS:

- INCREASE THE PRODUCTION OF ORGANIC MATTER BY PLANTING TREES AND SHRUBS IN WETLAND, WETLAND BUFFER, AND STREAM BUFFER AREAS.
- INCREASE FISH AND WILDLIFE HABITAT AND IMPROVE BIOLOGICAL DIVERSITY BY INSTALLING HABITAT FEATURES (HABITAT LOGS AND BRUSH PILES) AND PLANTING WITH A VARIETY OF NATIVE PLANT SPECIES THAT WILL CREATE MULTIPLE VEGETATION STRATA AS THEY MATURE.
- INCREASE VISUAL AND AURAL SCREENING OF EAST LAKE SAMMAMISH PARKWAY SE AND THE TRAIL FOR WILDLIFE PROTECTION AND HABITAT CONNECTIVITY.

1.2 MITIGATION OBJECTIVES AND PERFORMANCE STANDARDS

BUFFER PLANT COMMUNITIES

OBJECTIVE 1: ESTABLISH A MINIMUM OF 0.52 ACRE NATIVE FOREST AND SHRUB WETLAND BUFFER (AT THE INCREASED WETLAND BUFFER AND EXISTING WETLAND BUFFER AREAS) AND 0.15–ACRE NATIVE FOREST AND SHRUB STREAM BUFFER.

PERFORMANCE STANDARDS:

- YEAR 1 SURVIVAL OF PLANTED WOODY SPECIES IN THE ENHANCED WETLAND BUFFER AND ENHANCED STREAM BUFFER WILL BE AT LEAST 80 PERCENT.
- YEAR 3 NATIVE WOODY SPECIES WILL ACHIEVE A MINIMUM OF 35 PERCENT AERIAL COVER IN THE ENHANCED WETLAND BUFFER AND ENHANCED STREAM BUFFER.
- YEAR 5 NATIVE WOODY SPECIES WILL ACHIEVE A MINIMUM OF 60 PERCENT AERIAL COVER IN THE ENHANCED WETLAND BUFFER AND ENHANCED STREAM BUFFER.

OBJECTIVE 2: LIMIT INVASIVE NON–NATIVE SPECIES THROUGHOUT THE ENHANCED WETLAND BUFFER AND ENHANCED STREAM BUFFER MITIGATION PLANTING AREAS.

PERFORMANCE STANDARD:

- YEARS 1–5 KING COUNTY LISTED CLASS A AND REGULATED CLASS B AND C NOXIOUS WEEDS AND HIMALAYAN BLACKBERRY, CUTLEAF BLACKBERRY, SCOTCH BROOM, BUTTERFLY BUSH (BUDDLEIA DAVIDII), ENGLISH IVY, AND REED CANARYGRASS WILL NOT EXCEED 20 PERCENT AERIAL COVER IN THE PLANTING AREA.

WETLAND PLANT COMMUNITY

OBJECTIVE 3: ESTABLISH A MINIMUM OF 0.02 ACRE NATIVE SHRUB WETLAND.

PERFORMANCE STANDARDS:

- YEAR 1 SURVIVAL OF PLANTED WILLOW STAKES IN THE ENHANCED WETLAND WILL BE AT LEAST 80 PERCENT.
- YEAR 3 NATIVE WOODY SPECIES WILL ACHIEVE A MINIMUM OF 35 PERCENT AERIAL COVER IN THE ENHANCED WETLAND.
- YEAR 5 NATIVE WOODY SPECIES WILL ACHIEVE A MINIMUM OF 60 PERCENT AERIAL COVER IN THE ENHANCED WETLAND.

OBJECTIVE 4: LIMIT INVASIVE NON–NATIVE SPECIES COVER THROUGHOUT THE MITIGATION SITE PLANTING AREA.

PERFORMANCE STANDARD:

- YEARS 1–5 KING COUNTY LISTED CLASS A AND REGULATED CLASS B AND C NOXIOUS WEEDS AND HIMALAYAN BLACKBERRY, CUTLEAF BLACKBERRY, SCOTCH BROOM, BUTTERFLY BUSH (BUDDLEIA DAVIDII), ENGLISH IVY, WILL NOT EXCEED 10 PERCENT AERIAL COVER IN THE PLANTING AREA.

WILDLIFE HABITAT

OBJECTIVE 5: PROVIDE ENHANCED WETLAND, RIPARIAN, AND UPLAND WILDLIFE HABITAT.

PERFORMANCE STANDARD:

- YEARS 1, 3, 5 THE INCREASE IN AERIAL COVER OF NATIVE WOODY SPECIES IN THE INCREASED WETLAND BUFFER, ENHANCED WETLAND BUFFER, ENHANCED WETLAND, AND ENHANCED STREAM BUFFER, AS MEASURED IN OBJECTIVES 1 AND 3, WILL BE USED AS A SURROGATE TO INDICATE INCREASING HABITAT FUNCTIONS.
- YEARS 1, 3, 5 THE INSTALLED HABITAT FEATURES (E.G. HABITAT LOGS AND BRUSH PILES) ARE TO BE PRESENT AND FUNCTIONAL.
- YEAR 5 THE HABITAT STRUCTURE WILL PROVIDE MULTIPLE LAYERS BY AS TREES AND SHRUBS GROW IN ENHANCED WETLAND BUFFER, ENHANCED WETLAND, AND ENHANCED STREAM BUFFER.

ANTHROPOGENIC DISTURBANCE

OBJECTIVE 6: PROTECT THE MITIGATION SITE FROM ANTHROPOGENIC DISTURBANCE.

PERFORMANCE STANDARD:

- YEARS 1–5 CONDUCT QUALITATIVE MONITORING TO ASSESS THE STATUS OF THE SITE 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.

PHOTO–DOCUMENTATION OF SITE DEVELOPMENT

OBJECTIVE 7: DOCUMENT SITE DEVELOPMENT WITH PHOTOGRAPHS.

PERFORMANCE STANDARD:

PERMANENT PHOTOGRAPHIC STATIONS WILL BE ESTABLISHED TO MONITOR THE DEVELOPMENT OF THE ENHANCED WETLAND BUFFER AND ENHANCED STREAM BUFFER MITIGATION SITES. PHOTOGRAPHS WILL BE TAKEN FROM TRANSECT END POSTS AND FROM VANTAGE POINTS THAT CAPTURE THE GENERAL MITIGATION AREAS. ALL PHOTOGRAPHS WILL BE LABELED TO IDENTIFY LOCATIONS.

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 SITE PREPARATION AND PLANTING) WILL BE COORDINATED TO ENSURE THAT THE SITE IS CONSTRUCTED AS DESIGNED.

AFTER CONSTRUCTION IS COMPLETED, MONITORING WILL BE PERFORMED ANNUALLY TO ENSURE THAT THE GOALS AND OBJECTIVES OF THE MITIGATION EFFORTS 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.50.350). 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, PHOTOGRAPHIC EVIDENCE TO DOCUMENT SITE DEVELOPMENT, AND DATA COLLECTION FOR THE QUANTITATIVE EVALUATION OF PERFORMANCE STANDARDS. THE RESULTS OF THE MONITORING WILL BE SUBMITTED TO APPLICABLE PERMITTING AGENCIES.

APPROPRIATE CONTINGENCY MEASURES WILL BE DEVELOPED, AS NEEDED, BY A QUALIFIED PROFESSIONAL TO ENSURE THAT THE SITE DEVELOPS 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 (YEARS 1, 3, AND 5), MONITORING SCHEDULE, AND REPORT DEADLINES:

- THE MITIGATION SITES WILL BE ASSESSED BY AN APPROPRIATE QUANTITATIVE FIELD METHODOLOGY TO EVALUATE VEGETATIVE COVER (E.G., THE LINE INTERCEPT METHOD) FOR DETERMINING THE PERCENT OF AERIAL COVER FOR DESIRABLE WOODY SPECIES AND INVASIVE SPECIES.
- THE PRESENCE OF INSTALLED HABITAT FEATURES WILL BE ASSESSED EACH YEAR DURING VEGETATION MONITORING.
- 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 SITE FROM PERMANENT PHOTOGRAPH STATIONS.

2.1.2 QUALITATIVE MONITORING

QUALITATIVE ASSESSMENTS 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.

THE PLANTED VEGETATION SPECIES SHOULD BE ADAPTED TO VARYING SITE CONDITIONS IN THE PUGET SOUND LOWLAND; HOWEVER, 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 THE DISTANCES GENERALLY FOUND 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 PLANT 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.

ADDITIONALLY, APPLICATION OF AN HERBIVORE REPELLENT (E.G., PLANTSKYDD®) MAY BE NECESSARY FOR ALL PLANTS WITHIN THE SITE UPON COMPLETION OF PLANT INSTALLATION TO MINIMIZE BROWSE AND OTHER DAMAGE TO PLANTS FROM WILDLIFE DURING THE ESTABLISHMENT PERIOD.

2.3 CONTINGENCY MEASURES

IF MONITORING INDICATES THAT THE SITE IS 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 COUNTERMEASURES.

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 THEY HAVE 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.

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.

CITY OF SAMMAMISH APPROVAL

City Engineer	Date
Community Development	Date

DPER ACTIVITY NUMBER  
GRDE14-0052 / SHORE14-0022  
FEDERAL AID #

95 % REVIEW SUBMITTAL  
NOT FOR CONSTRUCTION

LANDSCAPE DETAILS

PROJECT NAME  
**EAST LAKE SAMMAMISH  
MASTER PLAN TRAIL  
SOUTH SAMMAMISH SEGMENT A**  
SAMMAMISH, WA

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STATE OF WASHINGTON  
LANDSCAPE ARCHITECT  
JENS SWENSON  
LICENSE NO. 656  
EXPIRES ON

ONE INCH AT FULL SCALE.  
IF NOT, SCALE ACCORDINGLY  
FILE NAME  
BL1521075P20T03LD-01  
JOB No.  
554-1521-075 P20T03  
DATE  
APRIL 2015

REVISIONS	DATE	BY	DESIGNED J. SWENSON
			DRAWN B. PURGANAN
			CHECKED Y. HO
			APPROVED O. KIKUTA







